SIXTH FIVE-YEAR REVIEW REPORT FOR
WESTERN PROCESSING CO., INC. SUPERFUND SITE
KING COUNTY, WASHINGTON

Prepared by

U.S. Environmental Protection Agency
Region 10
Seattle, Washington

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Date

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LIST OF ABBREVIATIONS & ACRONYMS

1,1,1-TCA	1,1,1-Trichloroethane
ADI	Acceptable Daily Intakes
ARAR	Applicable or Relevant and Appropriate Requirement
AWQC	Federal Ambient Water Quality Criteria
bgs	Below Ground Surface
CAC	Contingent Action Criteria
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cis-1,2-DCE	Cis-1,2-dichloroethylene
CFR	Code of Federal Regulations
COC	Contaminant of Concern
1,2-DCE	1,2-Dichloroethylene
Ecology	Washington Department of Ecology
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
FFS	Focused Feasibility Study
FS	Feasibility Study
FYR	Five-Year Review
HPMO	3-(2-hydroxypropyl)-5-methyl-2-oxazolidinone
HQ	Hazard Quotient
IC	Institutional Control
KCIWD	King County Industrial Waste Division
KPEG	Potassium hydroxide, polyethylene glycol
µg/L	Microgram per Liter
mg/kg	Milligram per kilogram
MCL	Maximum Contaminant Level
MNA	Monitored Natural Attenuation
MSL	Mean Sea Level
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
OPMO	3-(2-oxypropyl)-5-methyl-2-oxazolidinone
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PCE	Tetrachloroethylene
PLC	Programmable logic control
POTW	Publicly-Owned Treatment Works
PPA	Prospective Purchaser Agreement
PRP	Potentially Responsible Party
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROD	Record of Decision
RODA	Record of Decision Amendment
RPM	Remedial Project Manager
RSL	Regional Screening Level
SVOC	Semi-Volatile Organic Compound
TCE	Trichloroethylene
TPH	Total petroleum hydrocarbons
trans-1,2-DCE	Trans-1,2-dichloroethylene
UU/UE	Unlimited Use/Unrestricted Exposure
VOC	Volatile Organic Compound

I. INTRODUCTION

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (NCP) (40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the sixth FYR for the Western Processing Co., Inc. Superfund site (the Site). The triggering action for this policy review is the completion date of the previous FYR. The FYR has been prepared because hazardous substances, pollutants or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The Site consists of three operable units (OUs). This FYR addresses all three OUs. OU1 addresses surface cleanup. OU2 addresses the containment portion of the remedy. OU3 addresses the East Drain and Mill Creek portions of the cleanup. OU1 is considered Phase 1 of the cleanup. OU2 and OU3 are considered Phase 2 of the cleanup[1].

EPA remedial project manager (RPM) Piper Peterson led the FYR. Participants included EPA Region 10 hydrologist Bernie Zavala, Ching-Pi Wang from the Washington Department of Ecology (Ecology), and Treat Suomi and Sarah Alfano from Skeo (EPA FYR support contractor). The Boeing Company (Boeing), one of the Site's potentially responsible parties (PRPs) and Corporate Trustee for the Western Processing Trust Fund (Trust), was notified of the initiation of the FYR. The review began on 10/5/2017.

Site Background

The 14-acre Site is in an industrial and commercial area about 2 miles north of the city center of Kent, Washington, in the Kent Green River Valley (See Figure 1). The Western Processing Company operated on site from 1961 to 1983. The company originally reprocessed animal byproducts and brewer's yeast. The facility expanded in the 1960s to include recycling, reclaiming, treatment and disposal of industrial wastes. Site operations contaminated soil, groundwater and sediment with hazardous chemicals. In 1983, a federal court order permanently shut down the company's operations.

The area just north of the Site is undeveloped. East of the Site lies the Interurban Trail. This recreational trail runs parallel to a rail line and a railroad drainage ditch (the East Drain). The area south of the Site has been developed for light industrial uses. Land uses west of the Site are mostly commercial. The Site is zoned for industrial uses and is not currently in use beyond a new public roadway that crosses over part of the Site, remediation and an office/storage building. The Site's remedial components are considered in four sectors. Sector 1 includes the cap and extraction system within the southern slurry wall. Sector 2 includes the extraction system immediately southwest of Sector 1. Sector 3 includes the Trans Plume Area[2] and its accompanying extraction system of three wells. Sector 4 includes the final extraction system, located within the northern slurry wall (Figure 2).

[1] Site records differ regarding the number of OUs. This report considers that there are three OUs to maintain consistency with tracking in the EPA system.

[2] Early investigations indicated that there was 1,2-dichloroethylene present in an off-site plume west of the Site and that the trans isomer was present. However, more precise analytical techniques subsequently identified the 1,2-dichloroethylene present as primarily the cis isomer. Although low concentrations of the trans isomer were present in some areas of the Site, none is detectable west of the Site. Nevertheless, common usage throughout the Site's history has continued to reference the "trans plume" relative to the former dissolved volatile organic compound (VOC) plume west of the Site.

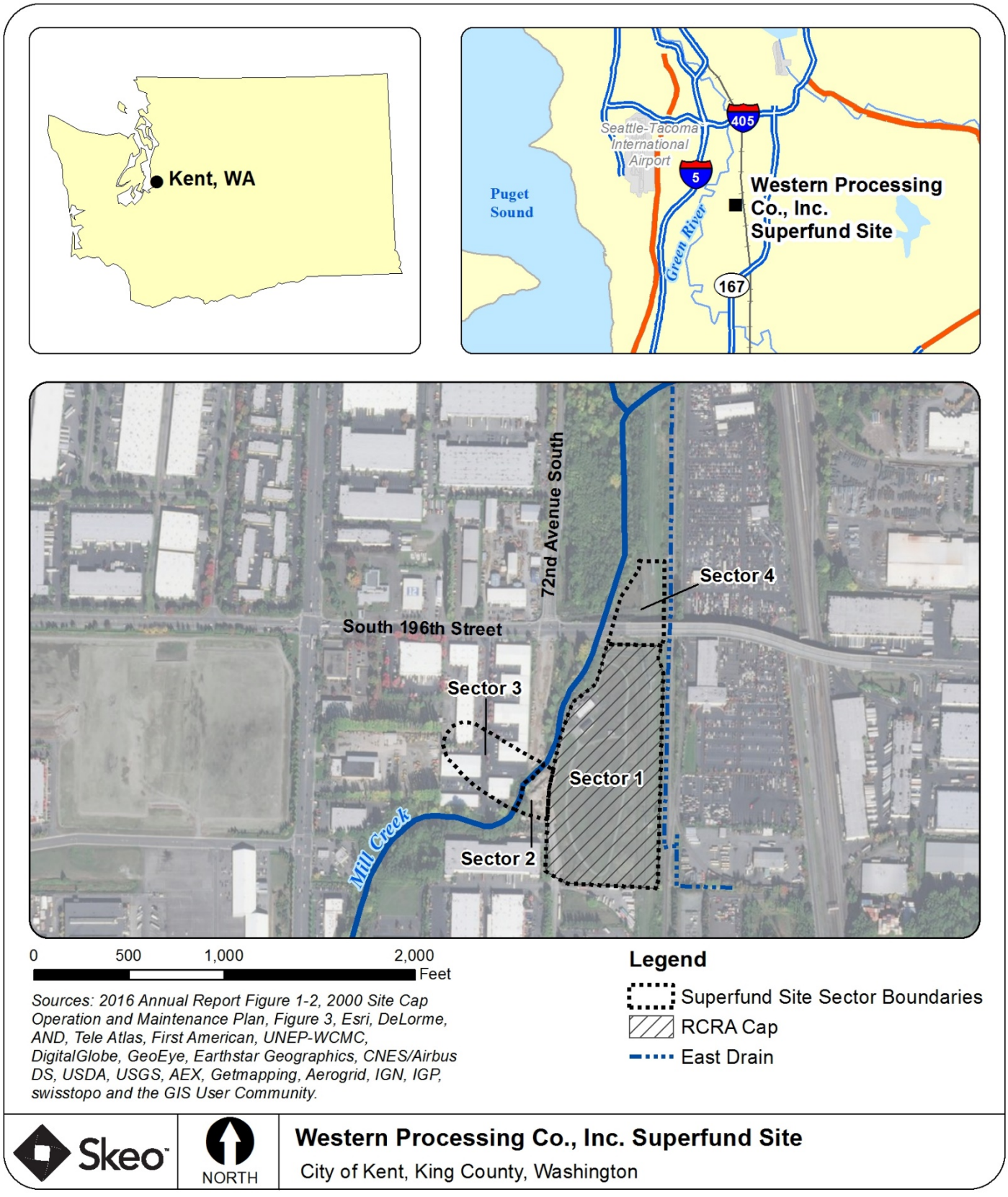
Mill Creek lies just outside of the western boundary of the Site and flows in a northerly direction into the Black River, a tributary of the Green River. The Green River flows into the Duwamish River before ultimately emptying into the Puget Sound. The Site is underlain by an alluvial shallow aquifer comprised of zones A, B and the deepest zone, C. Site operations contaminated Zone A and B groundwater, which flow to the northwest. Zone A groundwater generally discharges into Mill Creek and Zone B groundwater flows under the creek. Zone A and B flow are currently affected by groundwater extraction at the site.

Public drinking water is provided by the city of Kent from a deep, hydraulically isolated artesian aquifer more than a mile southeast (hydraulically upgradient) from the Site. There are no wells currently used for drinking water in the shallow aquifer within a mile radius of the Site. Appendix A lists additional resources used in preparation of this FYR Report. Appendix B provides the Site's chronology of events.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Western Processing Co., Inc.		
EPA ID: WAD009487513		
Region: 10	**State:** Washington	**City/County:** Kent/King
SITE STATUS		
NPL Status: Final		
Multiple OUs? Yes	**Has the Site achieved construction completion?** Yes	
REVIEW STATUS		
Lead agency: EPA		
Author name: Piper Peterson, with additional support provided by Skeo		
Author affiliation: EPA Region 10		
Review period: 10/5/2017 - 9/27/2018		
Date of site inspection: 1/9/2018		
Type of review: Policy		
Review number: 6		
Triggering action date: 9/27/2013		
Due date *(five years after triggering action date)*: 9/27/2018		

Figure 1: Site Vicinity Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

EPA inspected the facility in March 1981. By August 1982, EPA had ordered the site owners/operators to investigate contamination in soil, surface water and groundwater. When the owners/operators did not comply, EPA undertook the investigation in September 1982.

EPA's phased remedial investigation/feasibility study (RI/FS) work, which began during summer 1983 and proceeded at the same time as the surface cleanup (Phase 1, discussed in the next section), found over 90 of EPA's 126 priority pollutants in soil, groundwater, and surface water; heavy metals, polychlorinated biphenyls (PCBs), phenols and volatile organic compounds (VOCs) were the predominant contaminants. Most of the contamination was determined to be contained within the uppermost 15 feet of soil. Groundwater contamination was mostly concentrated from the water table to about 30 feet below ground surface (bgs), within Zone A.

The RI/FS identified high concentrations of metals in on-site soils and off-site soil. Site investigations found contaminants in the Zone A aquifer had migrated into Mill Creek prior to the installation of a slurry wall, and the contaminants in Zone B had been transported beneath Mill Creek and downgradient of the Site into an area known as the Trans Plume Area. Zone C was not impacted by site contamination. The 1985 FS identified unacceptable risk to future on-site workers and unacceptable risk from future use of on-site groundwater as a potable source (see Appendix H for additional background).

The Site's 1985 Record of Decision (ROD) noted that organic pollutant contamination in Mill Creek did not appear to pose a threat to human health based on recreational use. The water in Mill Creek near and downstream of the Site was evaluated for aquatic organisms, which were found in limited supply. Concentrations of dissolved metals, including zinc, cadmium, copper, and chromium, were found to exceed ambient water quality criteria for the protection of freshwater aquatic organisms. Sediments in Mill Creek were also contaminated with metals. Concentrations of organic contaminants in Mill Creek did not exceed ambient water quality criteria for the protection of freshwater aquatic organisms.

Response Actions

EPA conducted a removal action to stabilize the Site; it began in late April 1983 and finished in July 1983. Cleanup included the removal and off-site disposal of solidified paint sludges/flammables, flammable liquids in bulk and drums, combustible liquids in bulk, recycled solvents, corrosive liquids in bulk and drums, non-corrosive oxidizers in drums, PCB liquids and PCB-contaminated materials, and pond wastewater. EPA listed the Site on the Superfund program's National Priorities List (NPL) in September 1983. Using state funds, Ecology implemented stormwater control measures at the Site in the fall of 1983. PRP and EPA investigations, summarized in focused feasibility studies (FFSs) in 1984, suggested site remedial techniques focus on source control and containment measures.

OU1 – Surface Cleanup

EPA issued the Site's first ROD for OU1, or Phase 1 of cleanup, in August 1984 for surface cleanup and stormwater control. The remedial action objectives (RAOs) for the surface cleanup project include:

- Eliminate or reduce the threat of release of additional hazardous substances into the surface water, groundwater, soils and the air.
- Prevent or eliminate direct contact hazards for the people who must go on the Site for remedial investigation and site surveillance activities, and for potential fire or emergency response actions.
- Allow the design and implementation of additional and more wide-ranging and effective stormwater control to reduce the release of hazardous substances into the ground and surface water.

- Prepare the surface of the Site during this construction season so that the subsequent remedial actions on the Site can begin earlier and possibly be completed during the next construction season.

The 1984 ROD selected the following remedy for OU1:

- On-site and perimeter monitoring of air quality during remedial activities.
- Removal and proper disposal of liquids, waste piles, transformers and substation equipment, buildings, bulk storage tanks and surface debris.
- Stormwater control and treatment prior to discharge before, during and after the surface cleanup.
- Setup and operation of an on-site treatment plant after initial pond removal.
- Removal of each solid waste pile down to the existing grade level except for the gypsum sludge pond, which the State had excavated during stormwater management efforts. Removal of up to 750 cubic yards of soil below existing grade level in addition to the pile itself, with the depression forming a stormwater accumulation area for use after the surface cleanup. Grading of adjacent areas to the south to provide drainage to this area.

OU2 – Containment Components (slurry wall, groundwater treatment, cap and VOC plume) and OU3 – Remedial Components Related to Mill Creek and the East Drain

Following Phase 1 of cleanup, EPA issued the Site's second ROD for Phase 2 (OU2 and OU3) in September 1985 to address contaminated soil, buried waste, groundwater, Mill Creek and East Drain contamination, surface water and sediments. RAOs for the Phase 2 cleanup project, as stated in the Site's 1986 Consent Decree, include:

- Prevent direct human contact with or ingestion of contaminated soils either on or off site.
- Prevent the further spread of and, if possible, removal of the contamination from the shallow aquifer.
- Prevent further contaminant discharges (via groundwater) to Mill Creek at levels that are harmful to aquatic organisms.
- Control contaminated stormwater runoff from the Site.

EPA updated the 1985 ROD with a ROD Amendment (RODA) in September 1986. The final remedy for OU2 included these components related to soil and groundwater as designated by the 1985 ROD and revised by the 1986 RODA:

- On- and off-site soil sampling and analysis to determine extent of contamination, followed by excavation and off-site disposal of highly contaminated subsurface wastes.
- Excavation or covering and capping of all remaining contaminated soils outside the Western Processing Company property that are above background (i.e., the 1×10^{-5} excess cancer risk level) with bench-scale tests of soil solidification techniques.
- Excavation or cleaning and plugging of all impacted utility and process lines.
- Construction, operation and maintenance of a stormwater control system, maintenance of cover/caps, and excavation of utility manholes/vaults near the Site.
- Removal or decontamination of a lead-contaminated house.
- Performance of supplemental remedial planning studies if shallow groundwater contamination beyond the currently contaminated zones or significant regional contamination is detected.
- Construction and operation of a groundwater extraction system and treatment for Zone A (shallow) groundwater.
- Construction and operation of a groundwater extraction and treatment system for the trans plume in Zone B (deep) groundwater. Containment pumping and treatment of extracted groundwater from the Trans Plume Area.

These elements were implemented, with other elements either altered or included as part of the updated remedy required by the Site's 1995 Explanation of Significant Differences (ESD). The ESD addressed the need for hot spot remediation, a slurry wall, and the change from mass removal pumping to containment pumping. The rest of the final remedy included:

- Construction of a Resource Conservation and Recovery Act (RCRA)-consistent cap over Area 1 (the area southwest of Mill Creek in Parcel A) (see Figure 2) after removal of the original remedy's extraction and treatment system.
- Installation of a 40-foot-deep, 4,400-foot-long slurry wall and construction of an isolation wall parallel to South 196th Street.[3]
- Operation of a new containment pumping and treatment system for extracted groundwater inside the slurry wall.
- Implementation of institutional controls to protect the cap and slurry wall and limit groundwater usage on site and in the immediate area.
- Hot-spot remediation of targeted areas using bioremediation, thermal desorption and stabilization techniques.
- Site maintenance and groundwater monitoring for 30 years after cap installation unless the timeframe is modified.
- Development of a contingency plan for mitigating potential releases from the Site if containment pumping is not effective.

The final remedy for OU3 included these components related to Mill Creek and the East Drain:

- Monitoring of Mill Creek and the East Drain.
- Excavation of contaminated Mill Creek and East Drain sediments, along with additional actions for remediation as needed.
- Attainment of the Mill Creek performance standard, identified as the ambient water quality criteria for aquatic organisms or the upstream background, and excavation of contaminated Mill Creek sediments.
- Extensive monitoring of Mill Creek and the East Drain.
- Long-term surface water monitoring for 30 years after cap construction unless the timeframe is modified.

The 1986 Consent Decree specified performance standards for Mill Creek surface water be evaluated against the freshwater Federal Ambient Water Quality Criterion (AWQC) for Aquatic Organisms. Freshwater chronic AWQC are available only for site-related metals. No relevant AWQC for site VOCs were available at the time of the adoption of the Consent Decree and there are still no freshwater chronic AWQC for VOCs. For Mill Creek, current monitoring includes the following contaminants: cadmium, zinc, chromium, lead, copper and nickel (the metals of primary interest are zinc and cadmium but surface water monitoring stations are sampled for all metals). For the East Drain, the list of contaminants has been reduced to zinc and cadmium.

The 1986 Consent Decree required that groundwater be remediated for several metals and base neutral/acid extractables, and all volatile organic priority pollutants according to 40 C.F.R. § 264.122.[4] After years of monitoring, EPA approved the reduction of the targeted list of contaminants to the indicator chemicals listed in Table 1.

[3] According to the 2013 FYR Report, the slurry wall is a field modification that supplemented the remedial action described in the 1985 ROD and the AROD.

[4] https://www.epa.gov/sites/production/files/2015-09/documents/priority-pollutant-list-epa.pdf

Table 1: Indicator Chemicals for Water

Contaminants of Primary Interest	Media Monitored		
VOCs	**Groundwater**	**East Drain Surface Water**	**Mill Creek Surface Water**
Benzene	X	--	--
Chlorobenzene	X	--	--
Chloroform	X	--	--
1,2-Dichlorobenzene	X	--	--
1,1-Dichloroethylene (1,2-DCE)	X	--	--
1,1-Dichloroethane	X	--	--
Cis-1,2-dichloroethylene [b] (cis-1,2-DCE)	X	--	--
Trans-1,2-dichloroethylene [a] (trans-1,2-DCE)	X	--	--
Ethylbenzene	X	--	--
Methylene chloride	X	--	--
Styrene	X	--	--
Tetrachloroethylene (PCE)	X	--	--
Toluene	X	--	--
1,1,1-Trichloroethane (1,1,1-TCA)	X	--	--
Trichloroethylene (TCE)	X	--	--
Vinyl chloride [b]	X	--	--
O-xylene	X	--	--
M, p-xylene	X	--	--
METALS			
Cadmium	X	X	X
Zinc	X	X	X
Copper	X		X
Chromium	X		X
Nickel	X		X
Lead	X		X
OXAZOLIDINONES			
3-(2-hydroxypropyl)-5-methyl-2-oxazolidinone (HPMO)	X	--	--
3-(2-oxypropyl)-5-methyl-2-oxazolidinone (OPMO)	X	--	--

Notes:

a. The RODA, which documents the Consent Decree referencing the OU2 and OU3 remedies, refers to an off-site plume of trans-1,2-DCE located west of the Site (see remedy requirements in the Response Actions section of this FYR). The results of investigations prior to the Consent Decree indicated that the 1,2-DCE present was the trans isomer. However, more precise analytical techniques later identified the 1,2-DCE present as primarily the cis isomer. Although low concentrations of the trans isomer were present in some areas of the Site, none is detectable west of the Site.

b. The 1995 ESD noted that cis-1,2-DCE concentrations were decreasing in the Trans Plume Area while vinyl chloride concentrations were generally increasing or staying the same. 1,2-DCE will biodegrade to vinyl chloride. The ESD stated that it would not designate vinyl chloride standards at that time but indicated they could be implemented in the future. Monitoring for vinyl chloride is ongoing.

-- There are no federal AWQC for these constituents, so they are not sampled in the East Drain or Mill Creek.

Mill Creek performance standards were set in the 1985 Consent Decree, which documents the OU2 and OU3 remedies. Surface water quality goals for Mill Creek are the federal AWQC or background-derived concentrations where upstream concentrations approach or exceed the AWQC.

There are no site-wide cleanup standards for groundwater contaminants. The only contaminant cleanup standard established in the RODA required a cleanup level of 70 micrograms per liter (µg/L) for the cis-1,2-DCE off-site plume. Current groundwater monitoring is conducted according to contingent action criteria (CACs), which are based on the historical concentrations at individual wells or sampling locations per contaminant. CACs are listed in Table 5 in the Data Review section. The site decision documents did not select chemical-specific Applicable or Relevant and Appropriate Requirements (ARARs) as performance objectives for the remedy to achieve. Instead, they developed site-, well- and contaminant-specific CACs, which are based on the historical concentrations at individual wells or sampling locations per contaminant and not based on maximum contaminant levels (MCLs).

Status of Implementation

OU1 – Surface Cleanup

Under an August 1984 Consent Decree, a group of over 190 PRPs referred to as the Western Processing Trust Fund (Trust) undertook the surface cleanup designated as Phase I (the OU1 cleanup). Over 2,400 truckloads of chemical waste and contaminated soil and debris were removed from the Site, primarily in Sector 1. Once all surface structures (buildings, tanks, impoundments and waste piles) were cleared from the Site, the Site was graded to prevent stormwater runoff, a temporary lined pond was constructed to contain collected stormwater, and a portable treatment plant was brought on site to treat the collected water.

The Phase 1 surface cleanup finished in November 1984, except for a storage tank containing oily liquid contaminated with dioxins. In 1986, the Trust successfully treated about 6,000 gallons of the liquid on site with the KPEG (potassium hydroxide, polyethylene glycol) mobile chemical dechlorination process. Residual material from the treatment process was shipped off site. No other materials contaminated with dioxins were found on site.

OU2 – Containment Components (slurry wall, groundwater treatment, cap and VOC plume) and OU3 – Remedial Components Related to Mill Creek and the East Drain[5]

Subsurface
Phase 2 construction activities began in 1987. They included extensive testing to determine the limits of excavation of on-site subsurface wastes and off-site contaminated soils, excavation and Class 1 RCRA landfill disposal of over 25,000 cubic yards of highly contaminated soil and sludge as well as installation of the original groundwater extraction and treatment systems. The Trust completed work on the placement of a RCRA cap over Sector 1 (Figure 2) in 1999.

Groundwater
Groundwater extraction and treatment began in October 1988. As remediation progressed, and in compliance with the ESD, many old wells, piezometers, vacuum extraction wells and infiltration lines were decommissioned. The initial groundwater extraction and treatment system was decommissioned in 1996 and a new main extraction and treatment system was completed to provide automated operation of hydraulic containment in 1997. The treatment system provided air stripping for VOCs, and adsorption of the VOCs from the air stripper off-gas with activated carbon. It added new extraction wells in Sector 1 (wells S-1 through S-15). Two extraction wells (U1 and U2) were installed in Sector 2 (directly west of Sector 1 and outside the slurry wall). The new system also added two extraction wells in Sector 4 (wells S-16 and S-17) in 1997. The Sector 4 wells were discontinued in September 1998 (Figure C-2). Sector 3 extraction wells were discontinued in 1999.

Groundwater extraction continues for hydraulic containment in the portion of the Site enclosed by the Sector 1 slurry wall and for isolated areas directly west of the slurry wall bordering Sector 2. Treated water is discharged under permit number 4111-03 to the King County publicly-owned treatment works (POTW). Off gas from the air

[5] Additional remedial background information can be found in Appendix H.

stripper was carbon-treated prior to atmospheric release under a Puget Sound Air Pollution Control Agency permit (Notice of Construction 6840; Registration 12738). On June 26, 2018 the Puget Sound Clean Air Agency concluded that this project no longer requires a Notice of Construction permit because it has a de minimis impact on air quality and does not pose a threat to human health or the environment.

Slurry Wall
Remedial workers installed a 40-foot-deep, 4,400-foot-long slurry wall (Figure 2) in October 1988 around Sectors 1 and 4. It was a field modification that supplemented the remedial action described in the 1985 ROD and the 1986 RODA before issuance of the 1995 ESD. The slurry wall was included in the remedy to provide horizontal flow control in the upper aquifer to improve the pumping and cleanup efficiency and to provide extra protection for Mill Creek and the East Drain. According to the 2000 Cap operation and maintenance (O&M) plan, a shallow breach in the slurry wall (250-foot section) west of Sector 4 was replaced with sand backfill to an elevation of more than 7 feet. This segment is monitored for groundwater quality discharge to Mill Creek (see Figure 2).

The ESD maintained the slurry wall containment remedy and added the construction of a supplemental isolation wall immediately south of the South 196th Street right-of-way that would separate Sector 1 and Sector 4 (Figure 3). The isolation wall was constructed using a soil-cement-bentonite backfill material, which varied from the original slurry wall mix to ensure additional structural stability required to facilitate plans by the city of Kent to construct an embankment across the Site at the South 196th Street corridor for a major east-west arterial. With the isolation wall, the area north of South 196th Street, Sector 4, was segregated from the Sector 1 source area.

Surface Water
Implementation of the surface water monitoring program, including Mill Creek and the East Drain, began in January 1988. In April 1990, the cleanup achieved interim goals for Mill Creek. EPA issued a Preliminary Close-Out Report for the Site in December 1991.

Remediation of East Drain sediments took place in 1993; over 1,140 tons of sediment were disposed of off-site and gravel borrow was used as backfill. An interceptor system between the Interurban Trail and the East Drain was constructed; it included a well point extraction system installed in late 1993. The East Drain interceptor system operated for two years and use was discontinued in December of 1996 as part of the containment remediation strategy.

Trans Plume Area
In 1999, EPA approved the transition of the Trans Plume Area (Sector 3) to monitored natural attenuation (MNA), see Former VOC Area, MNA Area in Figure 3. In April 2000, extraction wells (T2, T3 and T4) within the Trans Plume Area were shut off because geochemical conditions in the soils support biological reductive dechlorination of target VOCs. Monitoring of VOCs (TCE, cis-1,2-DCE and vinyl chloride) in the Trans Plume Area continues.

Additional Soil Removal
The 1995 ESD required treatment of another 5,000 cubic yards of contaminated soil. After the boundaries of a suspected hot spot were determined to include over 5,000 cubic yards of highly contaminated soil, the areas were excavated and disposed of off-site.[6] The excavation was backfilled with lifts of clean gravel and crushed rock. Hot spot cleanup activities began in March 1997 and finished in October 1997.

The 2000 Long-Term Contingency Plan (updated in 2009) identifies procedures for evaluating containment and actions to be taken if those procedures indicate a loss of containment (i.e., if CACs are exceeded). The Trust currently maintains the Site.

[6] Containing chlorinated VOCs higher than 10 milligrams per kilogram (mg/kg), aromatic VOCs higher than 20 mg/kg, total petroleum hydrocarbons (TPHs) higher than 10,000 mg/kg, and/or metals higher than 25,000 mg/kg.

Institutional Control Summary

Institutional controls are included as part of the remedy for OU2 and required by the 1995 ESD (Table 2). The 1986 RODA noted that institutional controls are required in the form of restrictive covenants or deed notices to prohibit use or extraction of groundwater and to prohibit any land use that would disturb the integrity of the final cover or any other component of the containment or monitoring system.[7] They have been drafted in the form of a 1999 Institutional Control Work Plan, which has been implemented for groundwater (informational institutional controls) but not for the capped area.

Surrounding property owners receive annual notifications listing restrictions to groundwater use and noting that remedy components may be located on their property, such as monitoring wells, clean cover soil, or other remediation measures. The letters state that any excavation, earthwork, or other property improvement work that has the potential to disturb these features should be carefully planned and coordinated with the Trust and that disturbance to these features must be promptly repaired (Appendix L). Additionally, existing local regulations prohibit groundwater extraction or use of the water for potable purposes in the affected area if water is publicly available. Existing regulations take the form of King County Health Department regulations,[8] Ecology water right permits, zoning, and additional local environmental permitting, see Appendix M for additional details. The existing and probable future zoning and land use near Western Processing consists of commercial and light industrial operations. The site property is fenced and the Trust maintains an office at the Site for added security and remedy maintenance purposes (Figure 1). Ownership issues have been a barrier to implementing institutional controls at the Site. See Table 2 for a summary of the institutional controls required and in place.

Table 2: Summary of Planned Institutional Controls (ICs)

Media, Engineered Controls and Areas That Do Not Support UU/UE Based on Current Conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcels[a]	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Final capped area (soil) and monitoring system	Yes	Yes	0122049022[b]	Restrict any use that would disturb the integrity of the final cover, or any other component of any containment system, or the function of the monitoring system	Not Implemented (1999 Institutional Control Work Plan)

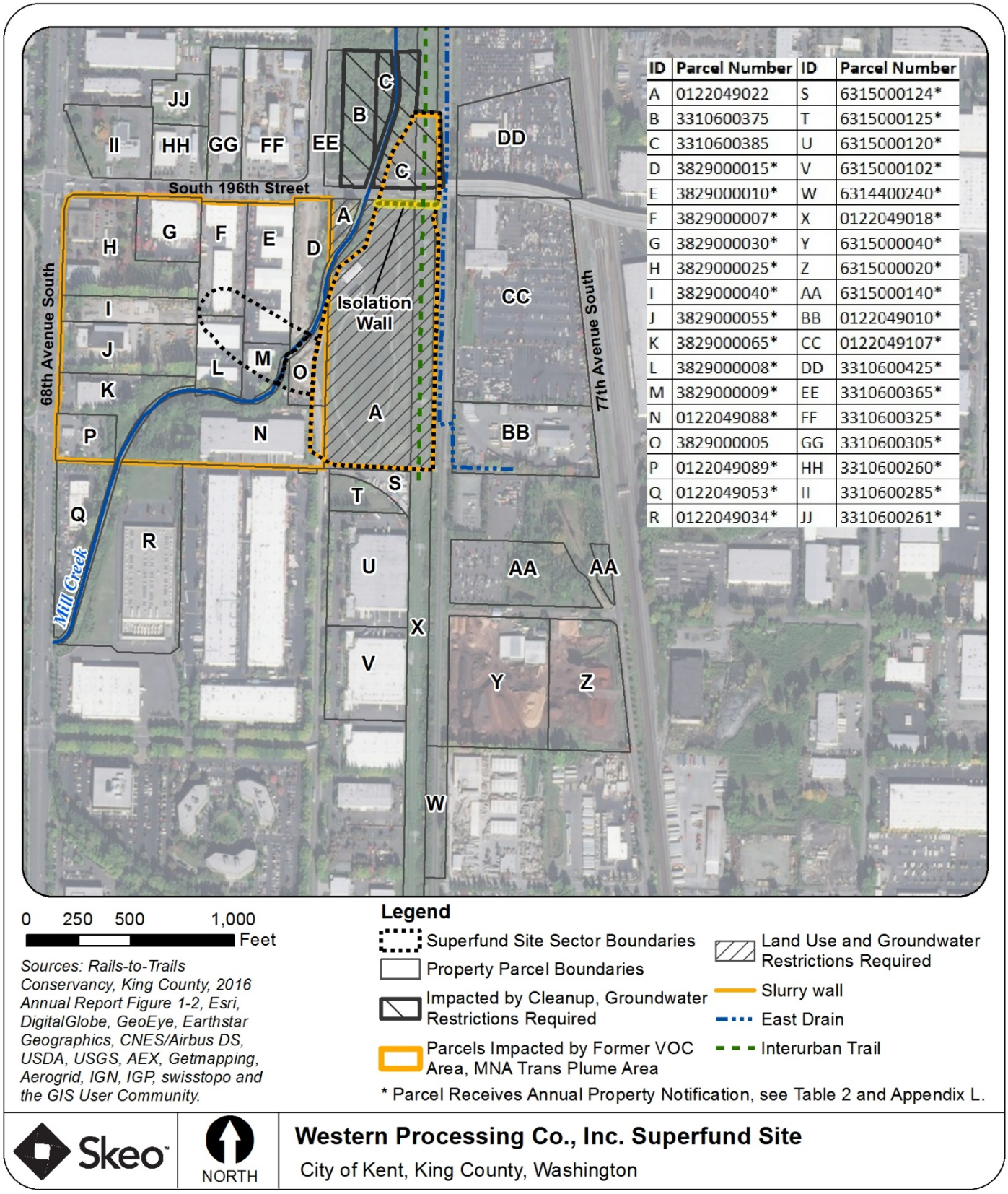
[7] According to the 1986 RODA, the 1985 ROD foresaw the need for such restrictions and the Consent Decree required them.
[8] King County regulations prohibit the installation of wells for the extraction and use of groundwater if there is a suitable public water supply within 1 mile of the property. Because the city of Kent operates a public water supply system within the area, all nearby owners should use the Kent water system, per King County regulations.

Media, Engineered Controls and Areas That Do Not Support UU/UE Based on Current Conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcels[a]	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Groundwater	Yes	Yes	3829000005[c] 3829000015[cg] 3829000010[cf] 3829000007[cg] 3829000030[cg] 3829000025[cf] 3829000040[cf] 3829000055[cf] 3829000065[cf] 3829000008[cf] 3829000009[cf] 3829000005[c] 3310600375[c] 3310600385[c] 0122049022[c] 0122049088[cg] 0122049018[cf] 0122049089[ef] 0122049053[ef] 0122049010[ef] 0122049107[eg] 0122049034[ef] 3310600425[eg] 3310600325[eg] 3310600260[ef] 3310600365[ef] 3310600285[ef] 3310600305[ef] 3310600261[ef] 6314400240[eg] 6315000124[eg] 6315000120[ef] 6315000102[ef] 6315000125[ef] 6315000140[eg] 6315000020[ef] 6315000040[ef]	Prohibit extraction and use of groundwater	King County regulations and annual property notifications as stated in the 1999 Institutional Control Work Plan[d]

Notes:

a. http://gismaps.kingcounty.gov/parcelviewer2.
b. Based on the maps of Area 1 as portrayed in the 1999 Institutional Control Work Plan.
c. Based on the Consent Decree references to "Area 1, Area V and Other Areas East of Mill Creek."
d. See Appendix M for additional details on existing regulations.
e. Based on property letter distribution list provided by Boeing on 5/30/2018.
f. Parcel receives Property Notification A, see Appendix L.
g. Parcel receives Property Notification B, see Appendix L.

Figure 2: Institutional Control Map



ID	Parcel Number	ID	Parcel Number
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B	3310600375	T	6315000125*
C	3310600385	U	6315000120*
D	3829000015*	V	6315000102*
E	3829000010*	W	6314400240*
F	3829000007*	X	0122049018*
G	3829000030*	Y	6315000040*
H	3829000025*	Z	6315000020*
I	3829000040*	AA	6315000140*
J	3829000055*	BB	0122049010*
K	3829000065*	CC	0122049107*
L	3829000008*	DD	3310600425*
M	3829000009*	EE	3310600365*
N	0122049088*	FF	3310600325*
O	3829000005	GG	3310600305*
P	0122049089*	HH	3310600260*
Q	0122049053*	II	3310600285*
R	0122049034*	JJ	3310600261*

Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

Systems Operations/Operation and Maintenance (O&M)

O&M activities required by the OU1 remedy were only necessary for the stormwater control portion of the project. OU2 and OU3 O&M activities required to ensure effectiveness of the remedy generally include:

- Operation of the groundwater extraction and treatment systems as long as necessary.
- Maintenance of the RCRA cap, soil covers, slurry wall and the stormwater control system.
- Long-term monitoring of the groundwater and Mill Creek.

All O&M activities are the responsibility of the Trust. Boeing, as Corporate Trustee for the Trust, is currently managing, operating, and maintaining site remedial components (including the Sector 1 cap, other soil covers, slurry walls and stormwater management facilities) in accordance with the 2000 Site Cap Operation & Maintenance Plan.

The treatment system has a programmable logic control (PLC) control which will either shut down the system or send out alarms and continue with operation if operating parameters are outside the design limits. Landau Associates has a Site O&M technician who is remotely connected to the system and able to respond (24 hours per day, 7 days a week). In addition, the Site O&M technician conducts daily system checks, conducts equipment inspections/troubleshooting/replacement/or repairs. System and monitoring program optimization are reviewed annually and presented in the annual report.

The Trust meets with EPA and the state biannually to discuss remedy performance and opportunities for O&M optimization such as discontinuing contaminant monitoring, decreasing or increasing monitoring frequency, and evaluating contingency plans. Technical evaluations of new monitoring data are also conducted during the biannual Governments' meeting to address any issues or adjust monitoring requirements as necessary, per the Long-Term Contingency Plan.

III. PROGRESS SINCE THE PREVIOUS REVIEW

This section includes the protectiveness determination and statement from the 2015 FYR Addendum as well as the recommendations from the 2013 FYR Report and 2015 FYR Addendum and the status of those recommendations. The 2013 FYR Report deferred sitewide protectiveness until further information could be obtained. A FYR Addendum was issued in 2015 to follow up on the relevant issues. Neither the 2013 FYR nor 2015 addendum made OU specific protectiveness determinations.

Table 3: Protectiveness Determinations/Statements from the 2013 FYR and 2015 FYR Addendum

Source	OU #	Protectiveness Determination	Protectiveness Statement
2013 FYR	Sitewide	Deferred	Based on this Technical Assessment, a protectiveness determination related to the remedy for the Western Processing Site cannot be made at this time. Additional data needs to be collected for the sediment portions of the remedy (East Drain and Mill Creek) to ensure they remain protective. With the exception of these sediment areas, the remedy currently protects human health and the environment in the short term because the contaminated groundwater and soil in the source area are contained within the slurry wall, the RCRA cap and the containment pumping and treatment system. The groundwater concentrations off the Western Processing property have decreased to below detection levels. There are no current exposures to site contaminants related to these portions of the remedy. However, for the remedy to be protective in the long term, institutional controls that will run with the land need to be placed on the properties located within the area bounded by the slurry wall.
2015 Addendum	Sitewide	Protective in the Short Term	The remedy at the Western Processing Site currently protects human health and the environment because the contaminated groundwater and soil in the source area are contained within the slurry wall, the RCRA cap and the containment pumping and treatment system. The groundwater concentrations off the Western Processing property have decreased to below detection levels. There are no current exposures to site contaminants related to these portions of the remedy. However, for the remedy to be protective in the long term, institutional controls that will run with the land need to be placed on the properties located within the area bounded by the slurry wall.

Table 4: Status of Recommendations from the 2013 FYR and 2015 FYR Addendum

OU #	Issue	Issue Source	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
2	Concentrations of PAHs in the East Drain are elevated considerably above the State of Washington's Freshwater Sediment Standards, calling into question the protectiveness of the sediment portion of the remedy.	2013 FYR	Evaluate PAH concentrations in Mill Creek and East Drain and determine whether contamination found is related to the site. Determine whether the sediment remedy is protective.	Evaluated and found to be protective	As part of the FYR Addendum, EPA determined that the East Drain is not capable of supporting a viable benthic community due to its ephemeral nature. Therefore, the application of standards to protect that community is not appropriate. Additionally, EPA dismissed concerns for benthic communities in Mill Creek sediment because concentrations were not found to exceed 1993 cleanup goals or the 2013 state Freshwater Sediment Standards.	9/28/2015
2	Permanent institutional controls that run with the land for those parcels which constitute Sector 1 (within the boundaries of the slurry wall) need to be developed and implemented.	2013 FYR and 2015 FYR Addendum	Develop and implement institutional controls.	Ongoing	Institutional controls have not been implemented. (1999 Institutional Control Work Plan)	Ongoing

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Community Involvement and Site Interviews

A public notice was made available by newspaper posting in *The Seattle Times* and the *Kent Reporter* on 1/5/2018 (Appendix D). The notices stated that the FYR was underway and invited the public to submit any comments to the EPA. The results of the review and the report will be made available at the Site's information repository, Kent Regional Library, located at 212 2nd Avenue North in Kent, Washington.

During the FYR process, interviews were conducted to document any perceived problems or successes with the remedy that has been implemented to date**.** The interviews are summarized below, and the interview forms are included in Appendix E.

Ching-Pi Wang with Ecology, Lindsey Mahrt with Boeing, and Christine Kimmel with Landau Associates were interviewed by email as part of the FYR process.

Ching-Pi Wang, with Ecology, stated that he thought the Site was mature and well managed, and that site procedures are well-known and effective. Mr. Wang noted that cleanup levels might have changed since the effective date of the Consent Decree and that he was comfortable with the status of the institutional controls at the Site.

Lindsey Mahrt with Boeing, representing the Trust, believes current remedial activities are effective and achieving goals of containment through the slurry wall, site cap and groundwater extraction treatment system. She does not think that the Site currently effects surrounding community. Additionally, Ms. Mahrt states that the Trust has been working with the city of Kent public works department to extend a public roadway over a portion of the Site. She believes the current remedy is effective in maintaining containment.

Christine Kimmel with Landau Associates, contractor for the Trust, stated that groundwater performance data supported the cessation of pumping from Sectors 3 and 4 and that the treatment system operates 24 hours a day, 7 days a week to maintain hydraulic containment goals in Sector 1. She notes that the extraction system achieves hydraulic containment goals, no evidence of cap erosion or damage has been observed, samples indicate compounds of interest are below the reporting limit in the downgradient MNA area, and no recent adverse impacts related to the Western Processing site have been observed in Mill Creek or East Drain. Elevated zinc concentrations were determined to be a local and limited source, as elevated zinc concentrations in Mill Creek (directly downgradient of Sector 4) were not reported. Zinc concentrations in Sector 4 continue to decrease.

Data Review

Data have been collected to assess the effectiveness of the containment remedy since the previous FYR, as reported in the Site's annual monitoring reports, prepared by Landau Associates for the Trust. The sections below describe the groundwater monitoring activities and analytical results for each containment area. Maps are provided in Appendix C to show the locations of monitoring wells and the extraction well system.

The 1999 Long-Term Contingency Plan establishes that containment occurs when the further spread of remaining site-related contamination is prevented. This occurs quantitatively in terms of three monitoring parameters:

- The difference in hydraulic heads measured at designated adjacent well or piezometer pairs.
- Groundwater quality measured at designated monitoring wells.
- Surface water quality measured at surface water monitoring stations.

For each of these parameters, contingent action criteria have been developed. These criteria represent the benchmarks against which site data are compared to demonstrate containment.

Monitoring Hydraulic Gradient for Containment
The containment remedy requires that shallow groundwater (Zone A) maintain an inward gradient within the slurry wall. PRPs collect groundwater elevation data from Zone A and Zone B monitoring well/piezometer pairs within the slurry wall on a quarterly basis and use these data to determine groundwater flow gradients.

From 2012 through 2017, all piezometer (P) and well pairs except for two pairs indicated a continuous inward/upward gradient. P26 (Zone B) had a slightly lower piezometric head (less than 1 foot) than RP28 (Zone A) in September 2016, October 2017 and November 2017, which indicates a downward gradient at this location. The nearest well pair in Sector 2, beyond the slurry wall, only showed contamination above CACs in Zone A (5M4A) over the last five years, not in Zone B (5M4B), which has not shown elevated cis-1,2-DCE, TCE or vinyl chloride concentrations since 2001. This suggests that despite an observed downgradient gradient in this area, contamination has not breached the slurry wall in the deeper Zone B. 1M33B (Zone B) had a slightly lower piezometric head (less than 1 foot) than P50 (Zone A) in March 2017 and in November 2017. There are no monitoring wells downgradient of that pair before Mill Creek. Both pairs showed positive piezometric head in readings in December 2017 and did not indicate a significant trend reversal in hydraulic gradient. The five-year averages per well/piezometer pair (Zone A and B) indicate that Zone B is maintained with a higher piezometric head than its Zone A counterpart, indicating an inward gradient is being maintained. Table I-1 in Appendix I provides the Sector 1 elevations. Additionally, during each sampling period, the average of the Zone B elevations within Sector 1 were higher than the Zone A elevations (Figure I-1, Appendix I).

Groundwater Quality
Groundwater monitoring takes place across the Site, in all four sectors. Figure C-1 shows monitoring locations.

Sector 1 Wells (inside slurry wall and capped area)
Monitoring wells within the Sector 1 slurry wall and screened within Zone A (shallow) continue to be contaminated due to the residual contamination on site. This groundwater is captured by the containment extraction system.

Four Zone B (deeper) wells (N1B, N3B, N4B, and N7B) are monitored on an annual basis. Two of those wells (N3B and N4B), had contaminant concentrations above the CACs during this. N4B had an isolated set of detected cis-1,2-DCE (8.3 µg/L, CAC 5 µg/L) and toluene (6.6 µg/L, CAC 5 µg/L) in 2017 (Table 5). Cis-1,2-DCE has not been detected in this well since 1988 and this was the first detection of toluene. N4B detections appear to be isolated events and monitoring will continue.

N3B had consistently high levels of zinc over the last five years, see Figure I-7 and Table 5, and had consistently lower levels prior to 2010. Zinc levels ranged from below the CAC of 45 µg/L to 2,680 µg/L. In addition, HPMO and OPMO (both oxazolidinones) were detected above CACs in 2016 and 2017 in N3B. The remaining two Zone B wells (N1B and N7B), have no detections above the respective CACs. Based on discussions during semiannual meetings, evaluation of the data indicates that monitoring at the Zone B wells in Sector 1 will continue.

Groundwater MNA Trans Plume[9]

Compliance with the 1,2-DCE performance standard is the CAC, which is when the total 1,2-DCE (cis- plus trans-) concentrations are at or below 70 µg/L. The historic plume area is monitored for TCE, cis-1,2-DCE and vinyl chloride to approximately 50 feet bgs.

Wells immediately downgradient of Sector 1, M4B, 7M26B, 15M38B, 15M40B and T2 (Figure C-1) are sampled annually. Wells further downgradient of Sector 1, 15M15B, 15M16B, 15M17B, 15M32B, 15M39B, 15M45B, T3 and T4, are sampled every five years. All MNA wells were sampled in 2017 to support the current FYR. The next sampling event for the further downgradient wells will be in 2022

Well 6M6B was decommissioned in October 2012 to facilitate the planned 72nd Avenue South roadway expansion. Well 15M42B is located between two traffic lanes of South 196th Street. For safety reasons, it is only sampled if VOCs are reported at the nearest upgradient well (15M45B). No VOCs were reported in well 15M45B; therefore, no sample was collected from 15M42B.

VOCs were not detected above CACs, nor above laboratory reporting limits, in any of these wells in the last five years. Cis-1,2-DCE was last detected above a CAC in December 2002 in 6M6B. The last time TCE was detected above a CAC was in November 1992 in 15M15B. The last time vinyl chloride was detected above a CAC was in December 2002 in 6M6B. These data continue to support the conclusion that breakdown of contaminants is occurring, and attenuation is happening, as expected.

Sector 2 Wells

5M4A monitors Zone A and 5M4B monitors Zone B and are downgradient from the Sector 1 slurry wall. 5M4A had levels of chlorobenzene that consistently exceeded the well's CAC of 5 µg/L in each of the last five years (ranging from 8.6 µg/L in 2013 to a high of 15 µg/L in 2015; see Table 5). In 2013, 2014 and 2017, the well exceeded the CAC for HPMO (2,010 µg/L, 1,060 µg/L and 1,360 µg/L; CAC 870 µg/L). It exceeded the CAC for OPMO (2,180 µg/L; CAC 1,600 µg/L) in 2013 only (see Figure I-3 and Table 5). Historically, shallow groundwater at well 5M4A was contaminated with chlorinated VOCs and zinc but generally, levels had decreased over time. Figure I-4 shows that vinyl chloride may have fluctuated and not noticeably decreased in the last decade. Vinyl chloride was not detected in 5M4A in 2017, 2016 or 2015.

5M4B has not shown elevated concentrations of cis-1,2-DCE, TCE or vinyl chloride since 2001. 5M4C was decommissioned in 2012. The nearest wells beyond the slurry wall, extraction wells U1 and U2, were not sampled for chlorobenzene but according to the annual reports, U1 has not shown elevated levels of vinyl chloride since 2008.

Sector 4 Wells

Over the last five years, only a few monitoring wells had groundwater exceedences of CACs (Table 5).

[9] The Consent Decree refers to an off-site plume of trans-1,2-DCE located west of the Site. Investigations since then have identified the 1,2-DCE present as primarily the cis isomer.

9M9B is the only Sector 4 monitoring well within the slurry wall that has contaminants above CACs. See Table 5. Cis-1,2-DCE was above the CAC in 2014 and 2017 (7.3 µg/L, 6.5 µg/L; CAC 5 µg/L); vinyl chloride has been above the CAC of 2 µg/L, fluctuating from under the reporting limit to a high of 6.8 µg/L in 2015 and most recently 4.1 µg/L in March 2018. Historical concentrations are charted in Figure I-6.

9M44A is located next to and downgradient of the Sector 4 slurry wall, between the slurry wall and Mill Creek. The well is positioned to monitor shallow groundwater exiting Sector 4 by the repaired slurry wall breach. This well has reported levels of vinyl chloride above the CAC annually since 2014, but previously had not exceeded these concentrations since 1999. There are no downgradient Zone A wells beyond 9M44A (see Figure C-1). It should be noted that groundwater is no longer extracted from the Sector 4 extraction wells. Extraction wells S16 and S17 were last operated in 1988. Increases in vinyl chloride concentrations are likely due to breakdown of cis-1,2-DCE in the area. These wells will continue to be monitored.

Table 5: Monitoring Wells with CAC Exceedances, 2013 to March 2018

Monitoring well	Contaminant	CAC (µg/L)	3rd Quarter 2013 (µg/L)	1st Quarter 2014 (µg/L)	3rd Quarter 2014 (µg/L)	1st Quarter 2015 (µg/L)	3rd Quarter 2015 (µg/L)	1st Quarter 2016 (µg/L)	3rd Quarter 2016 (µg/L)	Verification Sampling 2016 (µg/L)	1st Quarter 2017 (µg/L)	3rd Quarter 2017 (µg/L)	1st Quarter 2018 (µg/L)	Notes
5M4A	HPMO	870	**2,010 J**	NT	**1,060 J**	NT	141 J	NT	25 UJ	NT	NT	**1,360 J**	NT	Sector 2, right next to slurry wall, downgradient, Zone A
	OPMO	1,600	**2,180 J**	NT	1,360 J	NT	162 J	NT	25 UJ	NT	NT	808 J	NT	
	Chlorobenzene	5	**8.6**	NT	**11**	NT	**15**	NT	**15**	NT	NT	**12**	NT	
9M9B	cis-1,2-DCE	5	5 U	**7.3**	5 U	5 U	5 U	5 U	5 UJ	NT	**6.5**	5 U	5 U	Sector 4, within slurry wall, Zone B
	Vinyl chloride	2	2 U	**5.5**	**3.1**	**6.8**	2 U	**4.7**	2 U	NT	**5.7**	2 U	**4.1**	
9M44A	Vinyl chloride	2	2 U	2 U	**3.9**	**5 U**	**4.4**	2 U	**2.3**	NT	2 U	**2.4**	2 U	Right outside Sector 4 slurry wall, downgradient, Zone A
N3B	HPMO	25	25 U	NT	25 U	NT	25 U	NT	**352 J**	**43 J**	NT	**377**	NT	Sector 1, within slurry wall, Zone B
	OPMO	25	25 U	NT	25 U	NT	25 U	NT	**247 J**	25 U	NT	**293**	NT	
	Zinc (total)	45	**85.2**	**53.6**	**714 J**	**309**	**287**	**294**	**2,310**	**283**	34.7	**2,680**	**155**	
N3A1*	Zinc (total)	No CAC	84,100	NT	30,600J	NT	13,800	NT	14,000	NT	NT	9,950	NT	
N4B**	cis-1,2-DCE	5	5 U	5 U	5 U	NT	5 U	NT	5 U	NT	NT	**8.3**	NT	Sector 1, within slurry wall, Zone B
	Toluene	5	5 U	5 U	5 U	NT	5 U	NT	5 U	NT	NT	**6.6**	NT	

Notes:
J = Data validation flag indicating the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
U = Indicates compound was analyzed for but was not detected at the reported sample detection limit.
UJ= The compound was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate.
NT = Well was not sampled for this analyte.
* = Included for comparison with N3B because of proximity.
** = Specific data was not included in the 2016 annual report but report text stated that the 2016 analytical results were all below the respective laboratory reporting limits.
Bold indicates the value exceeds the CAC

Mill Creek and East Drain (Surface Water Quality)
Performance standards for Mill Creek surface water require that the concentrations of indicator chemicals (identified in the 1986 Consent Decree) and other priority pollutants at a designated downstream compliance point in Mill Creek meet federal AWQC for aquatic organisms. When the concentrations at the "background" upstream monitoring station approach or exceed an AWQC, the compliance level for site concentrations is adjusted based on a formula in the Consent Decree. Contaminants of interest in Mill Creek and the East Drain are zinc, chromium (total), cadmium, copper, nickel and lead.

EPA did not specify performance standards for water quality in the East Drain because the area is not capable of supporting a viable benthic community due to its ephemeral nature; application of standards to protect that community is not appropriate. However, as available, the area is sampled for cadmium and zinc.

Surface water monitoring takes place at three stations in Mill Creek (Stations upstream C1, downstream C3 and downstream C4) and at two stations in the East Drain (Stations D1 and D2), as shown on Figure 3. The Mill Creek stations are sampled semi-annually. The East Drain stations are sampled annually.

Concentrations of all metals analyzed at Stations C1, C3, and C4 in 2013, 2014, 2015, 2016 and 2017 were below their respective AWQC or performance standards, except for lead in 2014. Lead concentrations above the previously designated performance standard of 0.66 µg/L were reported during March 2014 at C1 (1.28 µg/L), C3 (1.27 µg/L) and C4 (1.32 µg/L). Since elevated lead concentrations were detected at upstream/background location C1, the performance standard was adjusted at C3 from 0.66 µg/L to 1.86 µg/L. The reported concentration at C3 is below the adjusted performance standard. Lead concentrations during September 2014 were all below the initial or adjusted performance standards.

Groundwater Extraction, Treatment and Discharge
Discharge Permit Compliance
As part of the Site's remedy, all air emissions were to comply with a discharge permit issued from the Puget Sound Air Pollution Control Agency. Additionally, the collected treated wastewater effluent from the treatment systems must meet discharge criteria specified in the POTW discharge permit.

Over the last five years, the treatment plant has operated continuously in compliance with the King County Industrial Waste Division (KCIWD) water discharge permit and a Puget Sound Air Pollution Control Agency permit, with brief shutdowns for routine maintenance. Under the Puget Sound Air Pollution Control Agency permit, the contractors must limit air emissions of vinyl chloride to less than 140 pounds during any 12-month period. Over the last five years, annual emissions have been well below the 140-pound limit, between 4 pounds and 6 pounds total (Table I-2). On June 26, 2018 the Puget Sound Clean Air Agency concluded that this project no longer requires a Notice of Construction permit because it has a de minimis impact on air quality and does not pose a threat to human health or the environment.

Groundwater Extraction System Performance
The groundwater extraction system at the Site operates to provide hydraulic containment of contaminated groundwater. Extracted groundwater is treated before discharge and meets KCIWD discharge permit standards. Between 2013 and 2017 the volume of groundwater extracted and then treated for Sector 1 and Sector 2 wells increased from 2,069,212 gallons annually to 3,728,813 gallons annually in 2017. This was mostly due to an increase in gallons extracted in Sector 1 (Figure I-2, Appendix I). In 2014, Sector 1 extraction wells were refurbished using acid cleaning methods to improve the performance of the extraction system; the average monthly extraction rates doubled (from 2.9 to 5.8 gallons per minute).

The mass removals for selected inorganic and organic contaminants in extracted groundwater were calculated for the entire system using contaminant concentrations in the treatment facility influent and the influent flow volumes from site annual reports. Table 6 provides additional information.

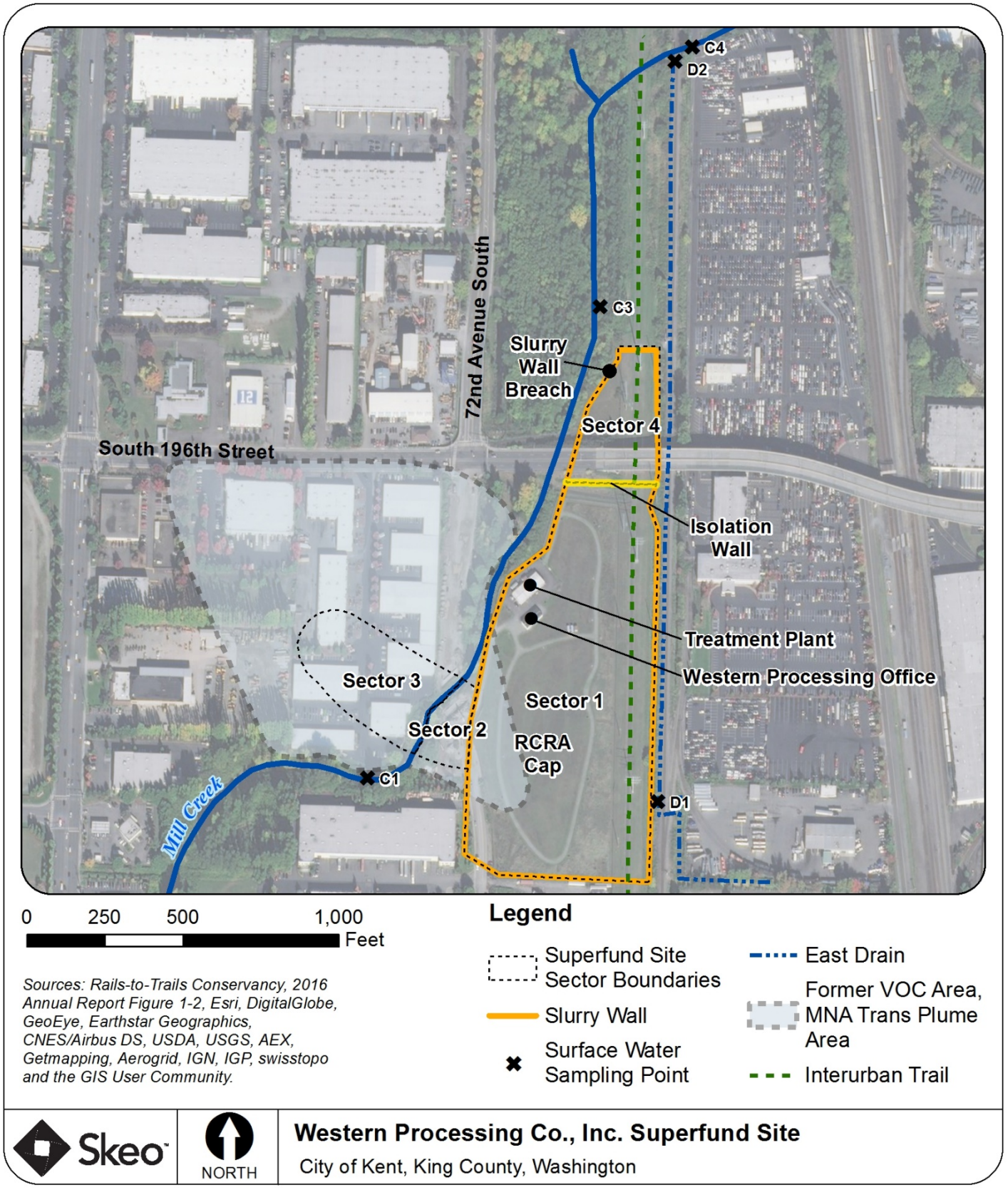
Table 6: Estimated Contaminant Mass Removed by Groundwater Extraction, 2013 to 2017*

Year	Zinc (pounds)	Cis-1,2-DCE (pounds)	TCE (pounds)	Vinyl Chloride (pounds)	HPMO (pounds)	OPMO (pounds)
2013	3.2	17.3	3.9	4.4	12.8	45.7
2014	5.3	18.9	4.7	5.0	17.5	67.2
2015	3.8	22.0	4.5	5.3	20.8	76.2
2016	3.6	20.0	4.2	4.8	23.7	90.6
2017	4.5	27.3	4.7	6.4	27.5	118.0

Notes:
* Table includes contaminant extractions of significant mass for contaminants of interest.

Extraction mass for contaminants of interest were similar across the last few years; masses generally increases with higher groundwater extraction rates. There are no targets for mass removal and gallons treated; this is a continuous containment effort.

Figure 3: Detailed Site Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

Site Inspection

The site inspection took place on 1/9/2018. Participants included EPA RPM Piper Peterson and EPA hydrologist Bernie Zavala, Ching-Pi Wang with Ecology, Lindsey Mahrt with Boeing, Christine Kimmel with Landau Associates (PRP contractor support), and Treat Suomi and Sarah Alfano with Skeo (EPA FYR support contractor). The purpose of the inspection was to assess the protectiveness of the remedy. The site inspection checklist is provided in Appendix F. Site inspection photos are provided in Appendix G.

Site participants met in the Western Processing Trust building on site and discussed site conditions, recent sampling and procedures before beginning the outdoor site tour, which included components of all four sectors. Participants toured the treatment building, identifying the monitoring system and power failure backup system as well as file storage. Treatment components for the air stripping system appeared to be in good condition. Participants also walked around the Site's capped area, noting that the area was secured and well-vegetated. Wells were easily identifiable. The tour continued outside the capped area where the East Drain was viewed. Remedial components in the area were secure, though one piezometer along the East Drain appeared to have exterior damage from lawncare services that were not part of site O&M activities. O&M contractor support made a note to contact the lawncare personnel and repair the cover. Participants walked through and around Sector 4, noting the location of the isolation wall. Participants also viewed wells in the commercial area where MNA took place and walked along the new on-site road before viewing the corresponding feeder vault for the in-road well. Participants noted various locations along Mill Creek, including surface sampling locations.

Afterwards, Skeo visited the Site's information repository, Kent Regional Library, located at 212 2nd Avenue North in Kent, Washington. Site records available included the 1994 Administrative Record and the 2013 FYR Report. Contact information was obtained for the government documents librarian. EPA will follow up to include the FYR.

V. TECHNICAL ASSESSMENT

QUESTION A: Is the remedy functioning as intended by the decision documents?

Question A Summary:

Yes, the remedies for OU1, OU2 and OU3 are functioning as intended by the decision documents.

The PRPs removed surficial hazardous waste and cleared surface structures before grading and other stormwater control measures were implemented. The remedies are currently maintained through a cap and a system of hydraulic containment of groundwater that includes a slurry wall, extraction and treatment of groundwater, and the assessment of groundwater quality within the MNA Trans Plume Area, the slurry wall and surface water. O&M activities are ongoing, in keeping with the Site Cap O&M Plan.

Monitoring wells within the Sector 1 slurry wall and screened within Zone A continue to indicate contamination above the reporting limits. These locations are representative of residual contamination on site and are in the area contained by the slurry wall and captured by the containment extraction system. N3B located in Sector 1, inside the slurry wall and within the capped area, continued to report concentrations of contaminants above the CACs during this FYR period. N3B had consistently high levels of zinc over the last five years and had consistently lower levels prior to 2010. Zinc levels ranged from below the CAC of 45 µg/L to 2,680 µg/L. In addition, N3B began to show levels of HPMO and OPMO above CACs in 2016. Elevated contaminants at N3B appear to be isolated as downgradient Zone B wells continue to report concentrations below the reporting limits.

5M4A, which monitors Zone A and is in Sector 2, has repeated exceedances for several contaminants.

Evaluation of wells occurs during biannual Governments' meetings with concurrence on any additional evaluations needed under the 1999 Long-Term Contingency Plan to determine any potential loss in containment.[10] Based on discussions during semiannual meetings, evaluation of the data indicates that monitoring of the wells with exceedances will continue.

Within the MNA Trans Plume Area wells, VOCs were not detected above laboratory reporting limits or CACs in the last five years. Results indicate that complete reductive dechlorination of TCE and breakdown products through to non-toxic products continues to occur.

Though the OU2 remedy requires institutional controls to protect the cap and slurry wall, and to limit groundwater usage on site and in the immediate area, institutional controls have only been implemented for groundwater and not for the capped area. There is no immediate risk of exposure due to the lack of on-site land use institutional controls. Groundwater and the capped area are managed appropriately on site and access is limited by a fence and a gate. Surrounding property owners receive annual notifications for relevant remedy component locations and groundwater areas (Appendix L) and existing local regulations restrict groundwater extraction and use. To ensure that there are no exposures in the future, institutional controls should be implemented for the capped area.

QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels and RAOs used at the time of the remedy selection still valid?

Question B Summary:

Yes, the exposure assumptions, toxicity data, cleanup levels and RAOs used at the time of the remedy selection are still valid.

A review of ARARs (Appendix J) and screening level risk review (Appendix K) indicates the remedy remains protective. There were no site-wide cleanup standards established for groundwater contaminants. The CACs are not based on MCLs or health-based concentrations, A screening-level health evaluation of the CACs (Appendix K) shows that most of the CACs fall within or are below EPA's risk management range of 1×10^{-6} to 1×10^{-4} except for vinyl chloride and chromium. The CAC for vinyl chloride is a statistically-based value which exceeds the upperbound of EPA's cancer risk range and the federal MCL. The CAC for lead exceeds the noncancer hazard quotient (HQ) of 1 however the concentration is equivalent to the background concentration and Superfund remediations cannot remediate to concentrations below background. Based on the screening-level risk evaluation, only the CAC for vinyl chloride exceeds the MCL and EPA risk range. The CAC remains valid because there are no current completed exposure pathways.

The only contaminant cleanup standard established at the time of remedy selection was for the cis-1,2-DCE off-site plume. A review of current federal groundwater MCLs indicates this remedial goal remains protective. Concentrations of chlorobenzene outside the slurry wall are below the current MCL but above the MCL for vinyl chloride.

The soil remedy included the excavation or covering and capping of all remaining contaminated soils outside the Western Processing Company property that are above background (i.e., the 1×10^{-5} excess cancer risk level), with bench-scale tests of soil solidification techniques. Off-site soils that exceeded the acceptable daily intake or cancer risk level of 1×10^{-5} were excavated. To determine if soil excavation levels remain protective, this FYR compared the excavation levels to EPA's current composite worker regional screening levels (RSLs) (Appendix K, Table K-1). Composite worker RSLs are used because the anticipated future use of the Site is industrial/commercial. The evaluation shows that the excavation levels for off-site and on-site PCBs remains protective because it falls within

[10] According to the 1999 Long-Term Contingency Plan, an indication of an exceedance will trigger a technical evaluation of the probable causes followed by notification and, if necessary, a remedial response recommendation to the governments for approval. The recommendation may consist of implementing predetermined contingent actions.

EPA's acceptable risk management range of 1×10^{-6} to 1×10^{-4} and is below the target risk level selected in the ROD of 1×10^{-5}. The lead cleanup goal of 1,000 mg/kg is based on outdated guidance. EPA OLEM Directive 9285.6-56 (May 17, 2017) recommends using the Adult Lead Methodology to assess lead risks from soil for the non-residential Superfund site scenarios. The recommended soil Preliminary Remediation Goal is 1,050 mg/kg which corresponds to a target blood lead concentration of 5 µg/deciliter. This updated goal is less stringent than the original cleanup goal, therefore the soil cleanup goal is still protective (Appendix K, Table K-2).

The 1985 FS identified 1,1,1-TCA as a frequently detected contaminant for both soil and groundwater inside Sector 1. Since the 1985 FS, a slurry wall and RCRA cap have been installed for Sector 1. Current groundwater results indicate 1,1,1-TCA is not present at concentration above the reporting limit in Zone A wells located outside Sector 1 and all Zone B wells (all Sectors). 1,1,1-TCA has been detected in limited groundwater samples outside of Sector 1 at wells 5M4A and 13M30A. Well 13M30A had two detections in 1994 and 2000 at concentrations slightly exceeding the reporting limit and at concentrations within the margin of error. Well 5M4A had six detections ranging from 6 to 156 ug/L with the last detection in 1991. Historically, 1,4-dioxane was used as a stabilizer for 1,1,1-TCA. Because early site investigations did not sample for 1,4-dioxane, PRPs should evaluate an appropriate plan to sample for 1,4-dioxane and take additional action if necessary.

QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?

Question C Summary:

No other information has come to light that could call into question the protectiveness of the remedy.

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the FYR:
OU1

Issues and Recommendations Identified in the FYR:

OU(s): 2	Issue Category: Institutional Controls			
	Issue: Institutional controls to protect the integrity of the final capped area and monitoring system have not been implemented, as required by decision documents.			
	Recommendation: Implement appropriate institutional controls.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA	10/31/2019

OU(s): 2 and 3	Issue Category: Remedy Performance			
	Issue: 1,1,1-TCA was identified as a frequently detected contaminant for soil and groundwater. Historically, 1,4-dioxane was used as a stabilizer for 1,1,1-TCA, however sampling for 1,4-dioxane has not occurred.			
	Recommendation: Evaluate an appropriate plan to sample for 1,4-dioxane and take additional action if necessary.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party/Support Agency**	**Milestone Date**
No	Yes	PRP	EPA	9/1/2019

VII. PROTECTIVENESS STATEMENT

Protectiveness Statement(s)	
Operable Unit: OU1	*Protectiveness Determination:* Protective
Protectiveness Statement: The remedy at OU1 is protective of human health and the environment. Surficial hazardous wastes were removed and surface structures were cleared so that no completed exposure pathways exist.	

Protectiveness Statement(s)	
Operable Unit: OU2	*Protectiveness Determination:* Short-term Protective
Protectiveness Statement: The remedy at OU2 currently protects human health and the environment because there are no current completed exposure pathways. The containment area is surrounded with a slurry wall to prevent migration of groundwater contamination. Groundwater and surface water monitoring do not indicate that contaminant concentrations have increased. However, for the remedy to be protective in the long-term, the following actions need to be taken to ensure protectiveness: implement appropriate institutional controls at the Site and evaluate appropriate sampling for 1,4-dioxane to determine if it is present in site media and take additional action if necessary.	

Protectiveness Statement(s)	
Operable Unit: OU3	*Protectiveness Determination:* Short-term Protective
Protectiveness Statement: The remedy at OU3 currently protects human health and the environment because there are no current completed exposure pathways. Contaminated sediment from the East Drain and Mill Creek has been removed and surface water monitoring continues. However, for the remedy to be protective in the long-term, the following action needs to be taken to ensure protectiveness: evaluate appropriate sampling for 1,4-dioxane to determine if it is present in site media and take additional action if necessary.	

Sitewide Protectiveness Statement
Protectiveness Determination: Short-term Protective
Protectiveness Statement: The remedy currently protects human health and the environment because the remedy at OU1 is protective, and there are no current completed exposure pathways at OU2 and OU3. However, for the remedy to remain protective in the long-term, the following actions need to be taken to ensure protectiveness: implement appropriate institutional controls at the Site and evaluate appropriate sampling for 1,4-dioxane to determine if it is present in site media and take additional action if necessary.

VIII. NEXT REVIEW

The next FYR Report for the Western Processing Co., Inc. Superfund site is required five years from the completion date of this review.

APPENDIX A – REFERENCE LIST

Record of Decision, Western Processing Superfund Site, U.S. EPA, August 1984.

Record of Decision, Western Processing Superfund Site, U.S. EPA, September 1985.

Amended Record of Decision, Western Processing Superfund Site, U.S. EPA, September 1986.

Copy of Western Processing Consent Decree, filed October 16, 1986.

Explanation of Significant Differences, Western Processing Superfund Site, U.S. EPA, December 11, 1995.

2013 Annual Evaluation Western Processing, Landau Associates, June 16, 2014.

2014 Annual Evaluation Western Processing, Landau Associates, June 3, 2015.

2015 Annual Evaluation Western Processing, Landau Associates, June 13, 2016.

2016 Annual Evaluation Western Processing, Landau Associates, June 12, 2017.

Second Five-Year Review, Western Processing Superfund Site, U.S. EPA, September 1998.

Third Five-Year Review Report, Western Processing Superfund Site, U.S. EPA, September 2003.

Fourth Five-Year Review Report, Western Processing Superfund Site, U.S. EPA, July 2008.

Fifth Five-Year Review Report, Western Processing Superfund Site, U.S. EPA, September 2013.

Addendum to Fifth Five-Year Review Report, Western Processing Superfund Site, U.S. EPA, September 2015.

Site Cap Operation & Maintenance Plan Western Processing, Western Processing Trust Fund, May 30, 2000.

Institutional Controls Work Plan, Western Processing, Western Processing Trust Fund, November 16, 1999.

Long-Term Contingency Plan Addendum, Western Processing, Landau Associates, January 7, 2009

APPENDIX B – SITE CHRONOLOGY

Table B-1: Site Chronology

Event	Date
Western Processing began operations on site	1961
EPA completed preliminary assessment/site investigation	December 1, 1982
EPA proposed the Site for listing on the NPL	December 30, 1982
Court order closed site operations	July 1983
EPA performed emergency removal of site wastes	July 1983
EPA placed the Site on the NPL	September 8, 1983
EPA began combined RI/FS for OU2	September 23, 1983
EPA began OU1 FS	June 13,1984
Site stakeholders began OU1 cleanup	July 21, 1984
Court and site stakeholders entered into Site's first Consent Decree	August 1984
EPA completed OU1 FS EPA issued OU1 ROD	August 5, 1984
Site stakeholders completed OU1 cleanup	September 30, 1984
EPA issued ROD for OU2 EPA completed combined RI/FS for OU2	September 25, 1985
EPA issued RODA	September 4, 1986
Court and site stakeholders entered into Site's second Consent Decree	October 16, 1986
Site stakeholders began OU2 remediation efforts	July 7, 1987
Remedial contractors began operations at groundwater treatment system	October 1988
Remedial contractors constructed the slurry wall	October 1988
EPA issued Site's Preliminary Close-Out Report	December 1991
EPA completed Site's first FYR Report	January 4, 1993
Remedial contractors began Mill Creek restoration (OU3)	July 1, 1993
Site remedial efforts achieved three-year performance standards for Mill Creek	August 1993
Site stakeholders began OU2 remediation	December 22, 1993
Remedial contractors installed East Drain extraction system	November 1994
Remedial contractors completed Mill Creek restoration (OU3)	March 7, 1995
EPA issued ESD for OU2	December 1995
Remedial contractors installed containment wells	June 1996
Remedial contractors started operating the new groundwater treatment system	July 1997
EPA completed Site's second FYR Report	September 1998
Remedial contractors completed construction of RCRA cap	October 1999
Remedial contractors started MNA for Trans Plume Area	April 2000
EPA issued Site's third FYR Report	September 30, 2003
EPA issued Site's fourth FYR Report	July 24, 2008
The City built the 72nd Avenue Extension	December 2012
EPA issued Site's fifth FYR Report	September 27, 2013
EPA issued Addendum to Site's fifth FYR Report	September 28, 2015

APPENDIX C – SITE MAPS

Figure C-1: Well and Piezometer Locations (Landau Associates, 2016 Annual Report)

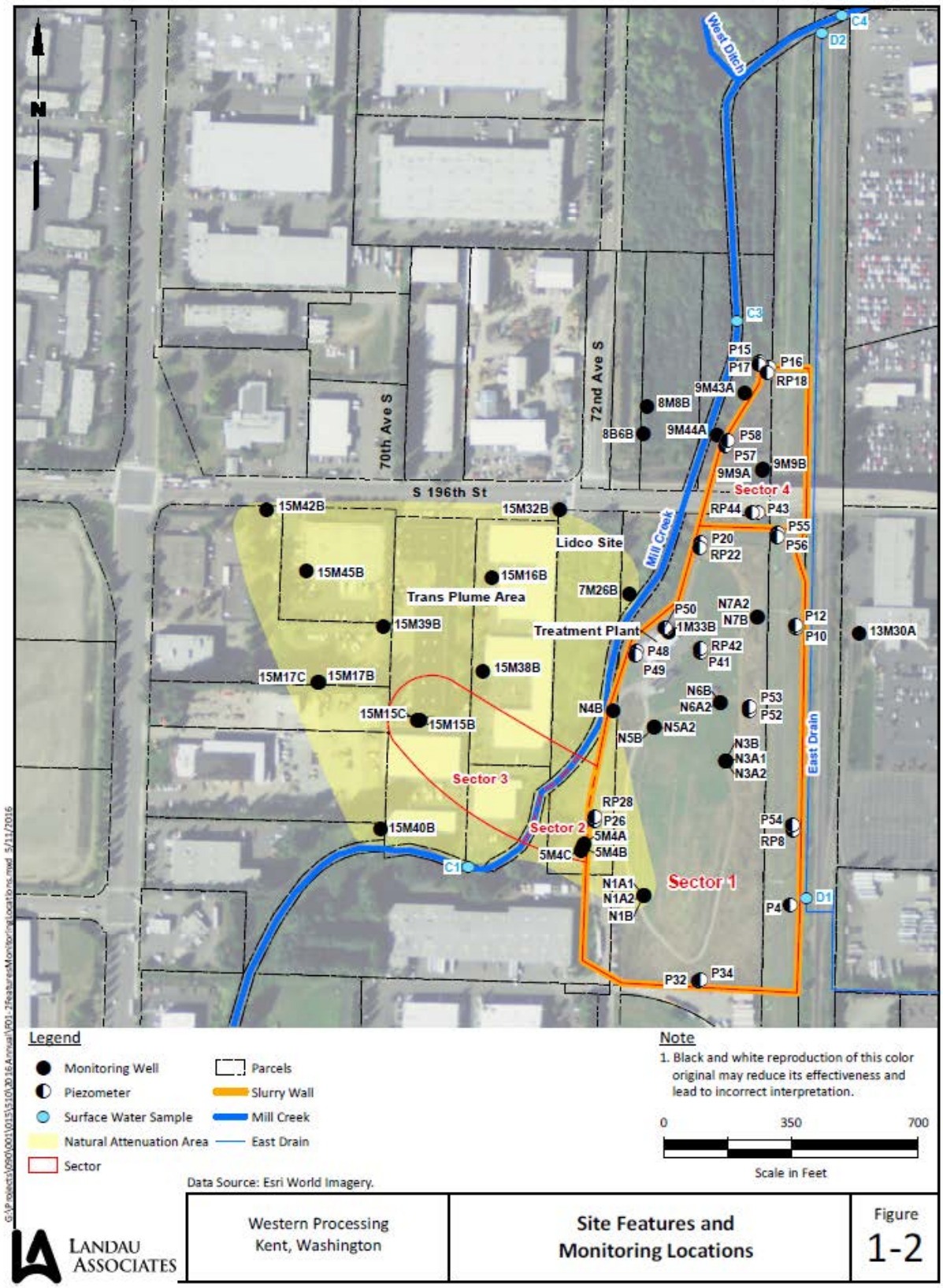
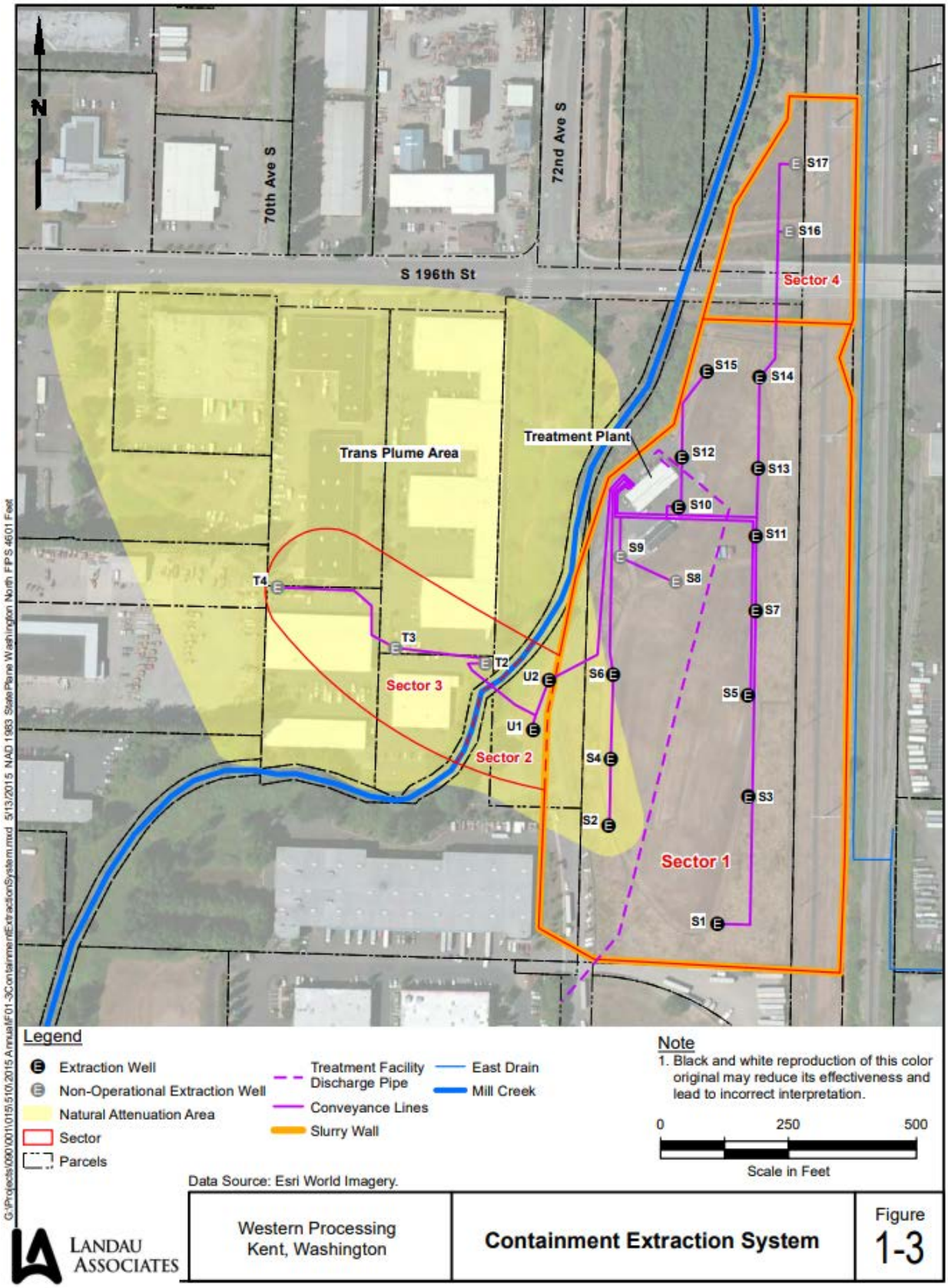


Figure C-2: Groundwater Extraction System (Landau Associates, 2016 Annual Report)



APPENDIX D – PRESS NOTICE

EPA United States Environmental Protection Agency

Cleanup Measures Reviewed for Western Processing Co., Inc. Superfund Site

We Want to Hear from You
We would like to make sure we keep you informed about site activities. We would also like to hear from you if you have information or observations that can help our review team. If you have questions about the site or would like to participate in an interview, ***the review team will be on-site in Kent on January 9, 2018.***

Contact Information: **Piper Peterson, EPA Project Manager (206) 553-4951**
peterson.piper@epa.gov

To Submit Written Comments:

Email to: peterson.piper@epa.gov

Mail to:
Piper Peterson, ECL-122
U.S. EPA Region 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101

Prior Five-Year Reviews, information and other documents are available.
Online:
https://www.epa.gov/superfund/western-processing

And at these locations:
Kent Regional Library
212 Second Avenue North
Kent, WA 98032 (253-859-3330)

EPA Superfund Record Center
1200 Sixth Ave, Suite 900 – ECL-161
Seattle, WA 98101 (206-553-4494)

The Sixth Five-Year Review Report will be ready after September 2018.

What and Why

The U.S. Environmental Protection Agency has started the Sixth Five-Year Review of the environmental cleanup at the Western Processing Co., Inc. Superfund Site, South 196th Street and Highway 167 (Valley Freeway), Kent, Washington. EPA reviews sites regularly when contaminants remain above levels that don't allow for unlimited use and unrestricted exposure. The five-year reviews ensure that cleanup actions continue to protect human health and the environment.

Site Background

The Western Processing Company operated from 1961 to 1983, when EPA ordered its closure. The company was originally an animal byproduct and brewer's yeast processor before transitioning to recycling, reclaiming, treating and disposing of industrial waste. Some of the Pacific Northwest's largest industries had contracts with Western Processing to handle a wide variety of chemicals and waste materials. Soil, sediments, and groundwater contamination was the result of operating practices and noncompliance to regulations.

Western Processing Co., Inc. Cleanup

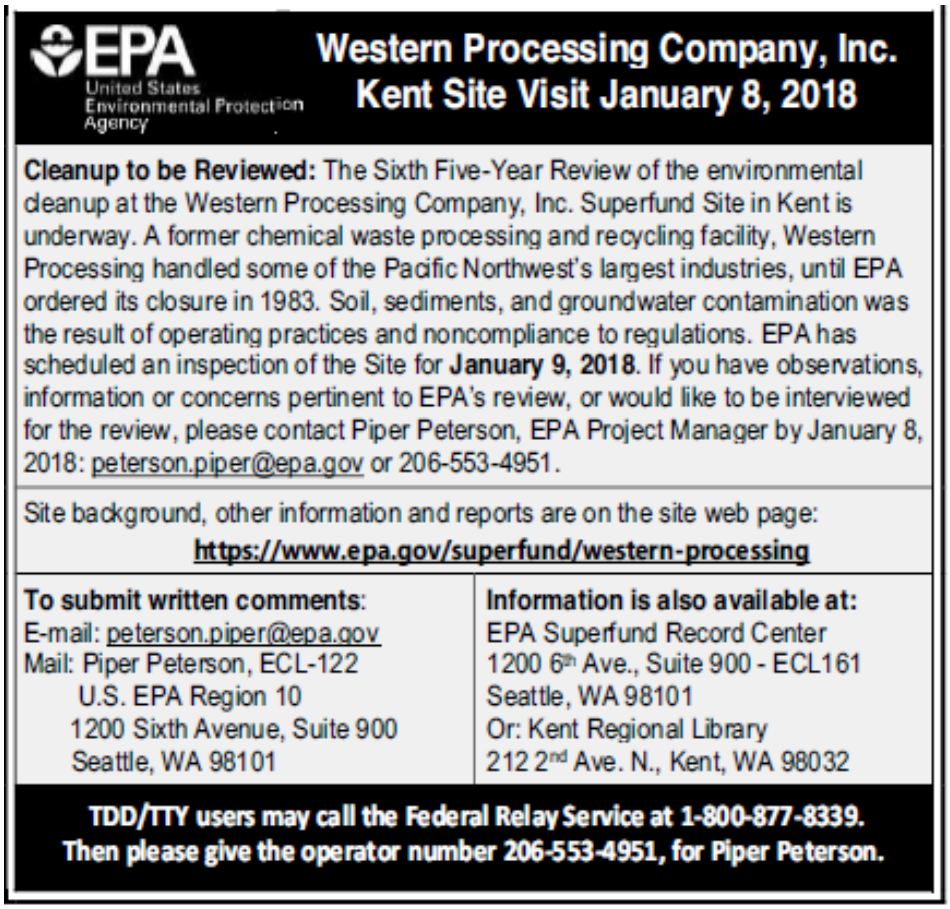
EPA's long-term cleanup started in 1984, which included:

- Excavation and disposal, by 1991, of 9.5 million pounds of highly contaminated soils and non-soil material.
- Containment of source contaminants on site with barrier walls, and a multilayered cap over the southern 13-acres.
- Groundwater treatment to remove contaminants. By 2000 groundwater pollutant levels had been reduced by 95%, when monitored natural recovery was put in place.

Additional measures completed since 2013:

- Additional sampling and evaluation of sediments in the East Drain and Mill Creek to ensure protection of bottom dwelling plant and animal life.
- Adding use restrictions (institutional controls) to the property deeds prohibiting wells for drinking water.

TDD / TTY users may call the Federal Relay Service at 800-877-8339. Please give the operator number (206) 553-4951.



EPA United States Environmental Protection Agency

Western Processing Company, Inc.
Kent Site Visit January 8, 2018

Cleanup to be Reviewed: The Sixth Five-Year Review of the environmental cleanup at the Western Processing Company, Inc. Superfund Site in Kent is underway. A former chemical waste processing and recycling facility, Western Processing handled some of the Pacific Northwest's largest industries, until EPA ordered its closure in 1983. Soil, sediments, and groundwater contamination was the result of operating practices and noncompliance to regulations. EPA has scheduled an inspection of the Site for **January 9, 2018**. If you have observations, information or concerns pertinent to EPA's review, or would like to be interviewed for the review, please contact Piper Peterson, EPA Project Manager by January 8, 2018: peterson.piper@epa.gov or 206-553-4951.

Site background, other information and reports are on the site web page:
https://www.epa.gov/superfund/western-processing

To submit written comments:
E-mail: peterson.piper@epa.gov
Mail: Piper Peterson, ECL-122
U.S. EPA Region 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101

Information is also available at:
EPA Superfund Record Center
1200 6th Ave., Suite 900 - ECL161
Seattle, WA 98101
Or: Kent Regional Library
212 2nd Ave. N., Kent, WA 98032

TDD/TTY users may call the Federal Relay Service at 1-800-877-8339.
Then please give the operator number 206-553-4951, for Piper Peterson.

APPENDIX E – INTERVIEW FORMS

Western Processing Co., Inc. Superfund Site — Five-Year Review Interview Form

Site Name: Western Processing Co., Inc. **EPA ID No.:** WAD009487513

Interviewer Name: Sarah Alfano **Affiliation:** Skeo
Subject Name: Christine Kimmel **Affiliation:** Landau Associates
Subject Contact Information:
Time: 09:10 a.m. **Date:** 02/07/2018
Interview Location: Landau Associates Edmonds, Washington office

Interview Format (circle one): In Person Phone Mail Other: *Email*

Interview Category: O&M Contractor

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)? Western Processing is an older project with investigation and cleanup activities starting in the 1990s. The cleanup generally included installation of a slurry wall and CAP in the Sector 1 area, installation of groundwater extraction wells in Sectors 1 through 4, and dredging of sections of Mill Creek and the East Drain. Groundwater performance data has supported the cessation of pumping from Sectors 3 and 4. The treatment system operates 24/7 to maintain hydraulic containment goals in Sector 1. Treatment system consists of an air stripper with a granular-activated carbon polisher. The treatment system is controlled by an automated programmable logic control (PLC) center that can send out alarms or shut down the system if conditions are outside of the design settings. Landau Associates has remote access and manual access to the treatment plant to address alarms. Site reuse activities include the extension of two public roadways crossing sections of the Site.

2. What is your assessment of the current performance of the remedy in place at the Site? The treatment system is able to achieve hydraulic containment goals. No evidence of CAP erosion or damage have been observed. Analytical results indicate compounds of interest have been reported below the reporting limit in the downgradient monitoring for the MNA area. Additionally, no adverse impacts related to the Site have been observed in Mill Creek or the East Drain since the dredging activities of these two surface water bodies in the 1990s. This data suggests the current performance of the remedy is sufficient to meet established goals.

3. What are the findings from the monitoring data? What are the key trends in contaminant levels that are being documented over time at the Site? Groundwater analytical results from the MNA area indicate the last compound of interest with concentrations above the laboratory report limit was vinyl chloride in March 2011. Analytical results from the downgradient MNA area indicate natural attenuation is effective in this area. Historical concentrations in the background well (13M30A) have decreased to below the laboratory reporting limit and agencies decided to reduce the sampling frequency from semiannual to annual. Historical elevated concentrations of zinc in Sector 4 wells resulted in an increase in the sampling frequency from annual to semiannual at the associated monitoring wells. The elevated zinc concentrations were evaluated as a local and limited source as elevated zinc concentrations in Mill Creek (directly downgradient of Sector 4) were not reported. Zinc concentrations in Sector 4 continue to decrease in concentration. Groundwater quality within Sector 1 (area of site within the slurry wall and under the engineer CAP) continue to have elevated concentrations of VOCs, SVOCs and metals.

4. Is there a continuous on-site O&M presence? If so, please describe staff responsibilities and activities. Alternatively, please describe staff responsibilities and the frequency of site inspections and activities if there is not a continuous on-site O&M presence. The treatment system has a PLC control which will either shut down the system or send our alarms and continue with operation if operating parameters are outside the design limits. Landau Associates has a site O&M technician who is remotely connected to the system continuously (24 hours per day, 7 days a week). The technician will respond to system alarms either remotely

or manually. In addition, technician is physically on site approximately 32 hours per week. The technician conducts daily system checks and conducts equipment inspections/troubleshooting/replacements/repairs. The technician also conduct site inspections per the plan on a weekly, monthly and quarterly basis.

5. Have there been any significant changes in site O&M requirements, maintenance schedules or sampling routines since start-up or in the last five years? If so, do they affect the protectiveness or effectiveness of the remedy? Please describe changes and impacts. Upgrades to a new computer and communications software for the PLC took place in 2016. The surfactant donor material automatic pump and feeder system were upgraded in 2017.

6. Have there been unexpected O&M difficulties or costs at the Site since start-up or in the last five years? If so, please provide details. No.

7. Have there been opportunities to optimize O&M activities or sampling efforts? Please describe changes and any resulting or desired cost savings or improved efficiencies. System and monitoring program optimization are reviewed annually and presented in the annual reports. Changes to the monitoring program are based on analytical results (increase frequency if concentrations increase, decrease if concentrations are stable to decreasing). Optimization of the treatment system is based on upgrading software or equipment as they age.

1. Do you have any comments, suggestions or recommendations regarding O&M activities and schedules at the Site? No.

2. Do you consent to have your name included along with your responses to this questionnaire in the FYR Report? Yes.

Western Processing Co., Inc. Superfund Site — Five-Year Review Interview Form

Site Name: Western Processing Co., Inc. **EPA ID No.:** WAD009487513

Interviewer Name: Sarah Alfano **Affiliation:** Skeo
Subject Name: Lindsey Mahrt **Affiliation:** Western Processing Trust
Subject Contact Information:
Time: 12:30 p.m. **Date:** 02/13/2018
Interview Location: Western Processing Site

Interview Format (circle one): In Person Phone Mail Other: *Email*

Interview Category: Potentially Responsible Parties (PRPs)

1. What is your overall impression of the remedial activities at the Site? Current remedial activities are effective and achieving goals of containment by the slurry wall, site cap and groundwater extraction treatment system.

2. What have been the effects of the Site on the surrounding community, if any? Previous effects were associated with the Trans Plume Area (downgradient from the Site), but concentrations in groundwater have decreased to below the reporting limit in this off-site area with the remedial activities and currently MNA is conducted. Current conditions indicate no effects on the surrounding community from the Site. The Trust regularly communicates with surrounding property owners via an annual notification letter. The Trust has been working with the City of Kent's Public Works department to extend a public roadway over a portion of the Site. As a result of the roadway expansion, site modifications were conducted to some subsurface utilities and monitoring wells.

3. What is your assessment of the current performance of the remedy in place at the Site? The current performance of the remedy in place at the Site is effective in maintaining containment. The slurry wall and treatment system maintain an inward and upward hydraulic gradient at the Site.

4. Are you aware of any complaints or inquiries regarding environmental issues or the remedial action from residents since implementation of the cleanup? I am not aware of any recent complaints or inquiries from residents.

5. Do you feel well-informed regarding the Site's activities and remedial progress? If not, how might EPA convey site-related information in the future? I feel well-informed regarding the Site's activities and remedial progress.

6. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy? I do not have any comments, suggestions or recommendations regarding management or operation at this time.

7. Do you consent to have your name included along with your responses to this questionnaire in the FYR Report? Yes.

Western Processing Co., Inc. Superfund Site **Five-Year Review Interview Form**

Site Name: **Western Processing Co., Inc.** **EPA ID No.:** **WAD009487513**

Interviewer Name: **Sarah Alfano** **Affiliation:** **Skeo**
Subject Name: **Ching-Pi Wang** **Affiliation:** **Ecology**
Subject Contact Information:
Time: **6:36 p.m.** **Date:** **February 27, 2018**
Interview Location: **Bellevue, WA**

Interview Format (circle one): **In Person** **Phone** **Mail** **Other:** ***Email***

Interview Category: **State Agency**

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)? A mature site; very well managed. Procedures well known and effective.

2. What is your assessment of the current performance of the remedy in place at the Site? Excellent.

3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years? None.

4. Has your office conducted any site-related activities or communications in the past five years? If so, please describe the purpose and results of these activities. None.

5. Are you aware of any changes to state laws that might affect the protectiveness of the Site's remedy? Cleanup levels may have changed since the effective date of the Consent Decree.

6. Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues? Yes.

7. Are you aware of any changes in projected land use(s) at the Site? A elevated roadway was built over the Site.

8. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy? No.

9. Do you consent to have your name included along with your responses to this questionnaire in the FYR Report? Yes.

APPENDIX F – SITE INSPECTION CHECKLIST

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site Name: Western Processing Co., Inc.	**Date of Inspection:** 1/9/18
Location and Region: Kent, Washington 10	**EPA ID: WAD009487513**
Agency, Office or Company Leading the Five-Year Review: EPA Region 10	**Weather/Temperature:** chilly and overcast

Remedy Includes: (Check all that apply)

- ☒ Landfill cover/containment
- ☒ Access controls
- ☒ Institutional controls
- ☒ Groundwater pump and treatment
- ☒ Surface water collection and treatment
- ☒ Other: Surface water monitoring for Mill Creek
- ☒ Monitored natural attenuation
- ☒ Groundwater containment
- ☒ Vertical barrier walls

Attachments: ☐ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (check all that apply)

1. **O&M Site Manager** Lindsey Mahrt (Name) | Project Manager (Title) | 2/19/18 (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone ☒ by email
   Problems, suggestions ☒ Report attached: See Appendix E

2. **O&M Staff** Christine Kimmel (Name) | ____ (Title) | 2/19/18 (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone ☒ by email
   Problems, suggestions ☒ Report attached: See Appendix E

3. **Local Regulatory Authorities and Response Agencies** (i.e., state and tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices). Fill in all that apply.

   Agency Washington Dept. of Ecology
   Contact Ching-Pi Wang (Name) | Uplands Unit Supervisor (Title) | 02/27/2018 (Date) | ____ (Phone No.)
   Problems/suggestions ☒ Report attached: See Appendix E

III. ON-SITE DOCUMENTS AND RECORDS VERIFIED (check all that apply)

1. **O&M Documents**

☒ O&M manual	☒ Readily available	☐ Up to date	☐ N/A
☒ As-built drawings	☒ Readily available	☐ Up to date	☐ N/A
☒ Maintenance logs	☒ Readily available	☐ Up to date	☐ N/A

Remarks: The site team visited the records/documents area during the inspection.

2.

Site-Specific Health and Safety Plan	☒ Readily available	☒ Up to date	☐ N/A
☒ Contingency plan/emergency response plan	☒ Readily available	☒ Up to date	☐ N/A

Remarks: The site team visited the records/documents area during the inspection.

3.	**O&M and OSHA Training Records**	☒ Readily available	☒ Up to date	☐ N/A	
	Remarks: The site team visited the records/documents area during the inspection.				
4.	**Permits and Service Agreements**				
	☒ Air discharge permit	☒ Readily available	☒ Up to date	☐ N/A	
	☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A	
	☒ Waste disposal, POTW	☒ Readily available	☒ Up to date	☐ N/A	
	☐ Other permits: _____	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: On June 26, 2018 the Puget Sound Clean Air Agency concluded that this project no longer requires a Notice of Construction permit because it has a de minimis impact on air quality and does not pose a threat to human health or the environment.				
5.	**Gas Generation Records**	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
6.	**Settlement Monument Records**	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
7.	**Groundwater Monitoring Records**	☒ Readily available	☒ Up to date	☐ N/A	
	Remarks: _____				
8.	**Leachate Extraction Records**	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
9.	**Discharge Compliance Records**				
	☒ Air	☒ Readily available	☒ Up to date	☐ N/A	
	☒ Water (effluent)	☒ Readily available	☒ Up to date	☐ N/A	
	Remarks: _____				
10.	**Daily Access/Security Logs**	☐ Readily available	☐ Up to date	☐ N/A	
	Remarks: Boeing Security is doing security checks at the Site for unusual activities.				

IV. O&M COSTS

1.	**O&M Organization**	
	☐ State in-house	☐ Contractor for state
	☐ PRP in-house	☒ Contractor for PRP
	☐ Federal facility in-house	☐ Contractor for Federal facility
	☐ _____	
2.	**O&M Cost Records**	
	☐ Readily available	☐ Up to date
	☐ Funding mechanism/agreement in place	☒ Unavailable
	Original O&M cost estimate: _____ ☐ Breakdown attached	
3.	**Unanticipated or Unusually High O&M Costs during Review Period**	
	Describe costs and reasons: _____	

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing Damaged** ☐ Location shown on site map ☒ Gates secured ☐ N/A

   Remarks: _____

B. Other Access Restrictions

1. **Signs and Other Security Measures** ☐ Location shown on site map ☒ N/A

   Remarks: _____

C. Institutional Controls (ICs)

1. **Implementation and Enforcement**

   Site conditions imply ICs not properly implemented ☐ Yes ☒ No ☐ N/A

   Site conditions imply ICs not being fully enforced ☐ Yes ☒ No ☐ N/A

   Type of monitoring (e.g., self-reporting, drive by):

   Self-reporting; office on site

   Frequency: Security does checks at the Site for unusual activities and there is a full-time technician on call and at the Site 3-4 times a week.

   Responsible party/agency: PRP

Contact	Lindsey Mahrt	Boeing	_____	_____
	Name	Title	Date	Phone no.

Reporting is up to date	☒ Yes	☐ No	☐ N/A
Reports are verified by the lead agency	☒ Yes	☐ No	☐ N/A
Specific requirements in deed or decision documents have been met	☐ Yes	☒ No	☐ N/A
Violations have been reported	☐ Yes	☐ No	☒ N/A

   Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☐ ICs are adequate ☒ ICs are inadequate ☐ N/A

   Remarks: Institutional controls still need to be implemented.

D. General

1. **Vandalism/Trespassing** ☐ Location shown on site map ☒ No vandalism evident

   Remarks: _____

2. **Land Use Changes On Site** ☐ N/A

   Remarks: A new roadway was completed in 2017, construction started in 2016.

3. **Land Use Changes Off Site** ☐ N/A

   Remarks: _____

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. **Roads Damaged** ☐ Location shown on site map ☒ Roads adequate ☐ N/A

   Remarks: _____

B. Other Site Conditions

Remarks: _____

VII. LANDFILL COVERS ☒ Applicable ☐ N/A

A. Landfill Surface

1. **Settlement** (low spots) ☐ Location shown on site map ☒ Settlement not evident
   Area extent: _____ Depth: _____
   Remarks: _____

2. **Cracks** ☐ Location shown on site map ☒ Cracking not evident
   Lengths: _____ Widths: _____ Depths: _____
   Remarks: _____

3. **Erosion** ☐ Location shown on site map ☒ Erosion not evident
   Area extent: _____ Depth: _____
   Remarks: _____

4. **Holes** ☐ Location shown on site map ☒ Holes not evident
   Area extent: _____ Depth: _____
   Remarks: _____

5. **Vegetative Cover** ☒ Grass ☒ Cover properly established
   ☒ No signs of stress ☐ Trees/shrubs (indicate size and locations on a diagram)
   Remarks: _____

6. **Alternative Cover** (e.g., armored rock, concrete) ☒ N/A
   Remarks: _____

7. **Bulges** ☐ Location shown on site map ☒ Bulges not evident
   Area extent: _____ Height: _____
   Remarks: _____

8. **Wet Areas/Water Damage** ☒ Wet areas/water damage not evident

   ☐ Wet areas ☐ Location shown on site map Area extent: _____
   ☐ Ponding ☐ Location shown on site map Area extent: _____
   ☐ Seeps ☐ Location shown on site map Area extent: _____
   ☐ Soft subgrade ☐ Location shown on site map Area extent: _____
   Remarks: _____

9. **Slope Instability** ☐ Slides ☐ Location shown on site map
   ☒ No evidence of slope instability
   Area extent: _____
   Remarks: _____

B. Benches ☐ Applicable ☒ N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

C. Letdown Channels ☐ Applicable ☒ N/A

(Channel lined with erosion control mats, riprap, grout bags or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

D. Cover Penetrations ☒ Applicable ☐ N/A

1. **Gas Vents** ☐ Active ☐ Passive
   ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
   ☐ Evidence of leakage at penetration ☐ Needs maintenance ☒ N/A
   Remarks: _____

2. **Gas Monitoring Probes**
   ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
   ☐ Evidence of leakage at penetration ☐ Needs maintenance ☒ N/A
   Remarks: _____

3. **Monitoring Wells** (within surface area of landfill)
   ☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition
   ☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A
   Remarks: _____

E. Gas Collection and Treatment ☐ Applicable ☒ N/A

F. Cover Drainage Layer ☒ Applicable ☐ N/A

1. **Outlet Pipes Inspected** ☒ Functioning ☐ N/A
   Remarks: _____

2. **Outlet Rock Inspected** ☐ Functioning ☒ N/A
   Remarks: _____

G. Detention/Sedimentation Ponds ☒ Applicable ☐ N/A

1. **Siltation** Area extent: _____ Depth: _____ ☒ N/A
   ☐ Siltation not evident
   Remarks: _____

2. **Erosion** Area extent: _____ Depth: _____
   ☒ Erosion not evident
   Remarks: _____

3. **Outlet Works** ☒ Functioning ☐ N/A
   Remarks: _____

4. **Dam** ☐ Functioning ☒ N/A
   Remarks: _____

H. Retaining Walls ☐ Applicable ☒ N/A

I. Perimeter Ditches/Off-Site Discharge ☒ Applicable ☐ N/A

1. **Siltation** ☐ Location shown on site map ☒ Siltation not evident

Area extent: _____ Depth: _____

Remarks: _____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A

☒ Vegetation does not impede flow

Area extent: _____ Type: _____

Remarks: _____

3. **Erosion** ☐ Location shown on site map ☒ Erosion not evident

Area extent: _____ Depth: _____

Remarks: _____

4. **Discharge Structure** ☒ Functioning ☐ N/A

Remarks: _____

VIII. VERTICAL BARRIER WALLS ☒ Applicable ☐ N/A

1. **Settlement** ☐ Location shown on site map ☒ Settlement not evident

Area extent: _____ Depth: _____

Remarks: _____

2. **Performance Monitoring** Type of monitoring: See FYR body text.

☐ Performance not monitored

Frequency: _____ ☐ Evidence of breaching

Head differential: _____

Remarks: _____

IX. GROUNDWATER/SURFACE WATER REMEDIES ☒ Applicable ☐ N/A

A. Groundwater Extraction Wells, Pumps and Pipelines ☒ Applicable ☐ N/A

1. **Pumps, Wellhead Plumbing and Electrical**

☒ Good condition ☒ All required wells properly operating ☐ Needs maintenance ☐ N/A

Remarks: A couple of piezometer casings had been run over by a mower. The O&M contractor indicated that he would replace them as part of normal O&M. The damage did not impact the operation or integrity of the equipment.

2. **Extraction System Pipelines, Valves, Valve Boxes and Other Appurtenances**

☒ Good condition ☐ Needs maintenance

Remarks: _____

3. **Spare Parts and Equipment**

☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: Spare parts were not confirmed but system was working well upon inspection and remedy failure alarms are in place if anything fails.

B. Surface Water Collection Structures, Pumps and Pipelines ☒ Applicable ☐ N/A

1. **Collection Structures, Pumps and Electrical**

☒ Good condition ☐ Needs maintenance

Remarks: _____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes and Other Appurtenances**

☒ Good condition ☐ Needs maintenance

Remarks: _____

3. **Spare Parts and Equipment**

☒ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: Spare parts were not confirmed but system was working well upon inspection and remedy failure alarms are in place if anything fails.

C. Treatment System ☒ Applicable ☐ N/A

1. **Treatment Train** (check components that apply)

☐ Metals removal ☐ Oil/water separation ☐ Bioremediation

☒ Air stripping ☒ Carbon adsorbers

☐ Filters: _____

☒ Additive (e.g., chelation agent, flocculent): _____

☐ Others: _____

☒ Good condition ☐ Needs maintenance

☒ Sampling ports properly marked and functional

☒ Sampling/maintenance log displayed and up to date

☐ Equipment properly identified

☒ Quantity of groundwater treated annually: Annual average of almost 3 million gallons

☐ Quantity of surface water treated annually: _____

Remarks: _____

2. **Electrical Enclosures and Panels** (properly rated and functional)

☐ N/A ☒ Good condition ☐ Needs maintenance

Remarks: _____

3. **Tanks, Vaults, Storage Vessels**

☐ N/A ☒ Good condition ☐ Proper secondary containment ☐ Needs maintenance

Remarks: _____

4. **Discharge Structure and Appurtenances**

☐ N/A ☒ Good condition ☐ Needs maintenance

Remarks: _____

5. **Treatment Building(s)**

☐ N/A ☒ Good condition (esp. roof and doorways) ☐ Needs repair

☒ Chemicals and equipment properly stored

Remarks: _____

6. **Monitoring Wells** (pump and treatment remedy)

☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition

☒ All required wells located ☐ Needs maintenance ☐ N/A

Remarks: _____

D. Monitoring Data

1. **Monitoring Data**

☒ Is routinely submitted on time ☒ Is of acceptable quality

2. **Monitoring Data Suggests:**

☒ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition

☒ All required wells located ☐ Needs maintenance ☐ N/A

Remarks: _____

X. OTHER REMEDIES

If there are remedies applied at the site and not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is designed to accomplish (e.g., to contain contaminant plume, minimize infiltration and gas emissions).

The remedy selected for the Western Processing site involves containment of the source contaminants on site through the use of barrier walls, a RCRA cap, institutional controls and sufficient extraction of groundwater to prevent outward migration.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

O&M procedures are discussed and verified with EPA. Current monitoring appears to be on track for monitoring the progression of the remedy and maintaining protectiveness.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

Site conditions did not indicate any issues with remedy protectiveness.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

None noted during this FYR. EPA, the PRPs and O&M contractors regularly communicate and implement optimization methods over time as needed.

APPENDIX G – SITE INSPECTION PHOTOS

Treatment plant

Site entrance gate

Capped area in Sector 1

Sector 1 Extraction Well, S-6

Paved trail looking north, along boundary of Sector 1 and the East Drain

East Drain area

Sector 4, facing south

C3 surface water sampling location in Mill Creek

APPENDIX H – DETAILED REMEDIAL BACKGROUND

EPA determined risk to public health with an endangerment assessment, as documented in the 1985 FS Report. EPA investigated the risks associated with contaminants known or suspected to be carcinogens as well as non-carcinogens. Assuming that a person worked on site for 40 years, ingestion of on-site soils up to 12 feet deep would lead to a maximum excess lifetime cancer risk of 2×10^{-4}, principally from PCB contamination. There is a potential excess lifetime cancer risk of 5×10^{-7} associated with the ingestion of on-site surface soils with site mean concentrations in a future worker scenario. An estimated potential cancer risk of 5×10^{-6} is associated with the ingestion of soils if the maximum surface concentrations are used. The potential excess lifetime cancer risks associated with ingestion of off-site surface soils contaminated with PCBs ranged from 9×10^{-6} to 3×10^{-5}.

No known domestic or industrial water supplies were affected by the Site. Use of on-site groundwater as a potable water source for a work place, however, would present an estimated excess lifetime cancer risk of 2×10^{-1} using maximum on-site concentrations and 8×10^{-3} using mean on-site concentrations. Cancer risk would increase to an estimated 5×10^{-1} under a residential scenario with maximum concentrations and 2×10^{-2} with the use of mean on-site concentrations. Organic compounds contribute most of this excess lifetime cancer risk. A number of average daily intakes were also exceeded, with an assumed consumption of 0.1 gram of soil per day or 2 liters of groundwater per day. These contaminant exceedances included lead, chromium, cadmium, toluene, 1,1,1-TCA, phenol, mercury, and bis(2-ethylhexyl) phthalate.

OU2 – Containment Components (slurry wall, groundwater treatment, cap and VOC plume)
OU3 – Remedial Components Related to Mill Creek and the East Drain

In the fall of 1986, the Trust conducted the soil and soil/waste sampling program and geophysical investigation. These data were used to determine the limits of excavation of on-site subsurface wastes and off-property contaminated soils. In January 1987, the Trust conducted the Phase 2 subsurface cleanup. Subsurface remedial design and construction proceeded at the same time.

Construction activities began in summer 1987. They included excavation and Class 1 RCRA landfill disposal of over 25,000 cubic yards of highly contaminated soil and sludge as well as installation of the original groundwater extraction and treatment systems.

Groundwater extraction and treatment in the original system began in October 1988 and ended in 1996. The system had two major components – air stripping for VOCs, followed by thermally regenerated carbon adsorption units to capture vapor-phase contaminants. After processing, extracted groundwater was discharged to the local POTW or reinjected into the ground through the infiltration system. The extraction system had four shallow groundwater extraction and infiltration areas; these systems were spread across areas of the Site in Sectors 1 through 4 as defined in the FYR Site Background section. Seven barrier monitoring wells were installed west of Mill Creek.

As remediation progressed, and in compliance with the ESD, many old wells, piezometers, vacuum extraction wells and infiltration lines were decommissioned. A new main extraction and treatment system was installed in 1996 to provide automated operation of hydraulic containment. The treatment system added 15 new extraction wells in Sector 1 (wells S-1 through S-15). Two extraction wells (U1 and U2) were installed directly west of Sector 1, outside the slurry wall, in 1993. The new system also added two extraction wells in Sector 4, which was known to have lower levels of contamination (wells S-16 and S-17), in 1997 though the ultimate goal of the remedial system in Sector 4 was to establish passive treatment. The Sector 4 wells stopped operation in September 1998 (Figure C2). Sector 3 extraction wells (T2, T3 and T4) were discontinued in 1999. Construction of the new (current) groundwater treatment facility plant finished in 1997. Groundwater extraction continues for hydraulic containment in the part of the site enclosed by the Sector 1 slurry wall and for isolated area remedy directly west of the Sector 2 slurry wall. Treated water is discharged under permit to the King County POTW. Off gas from the air stripper was carbon-treated prior to atmospheric release under a Puget Sound Air Pollution Control Agency permit. On June 26, 2018 the Puget Sound Clean Air Agency concluded that this project no

longer requires a Notice of Construction permit because it has a de minimis impact on air quality and does not pose a threat to human health or the environment.

Remedial workers installed a 40-foot-deep, 4,400-foot-long slurry wall (Figure 2) in October 1988. It was a field modification that supplemented the remedial action described in the 1985 ROD and the RODA before issuance of the 1995 ESD. According to the 2000 Cap O&M Plan, a shallow breach in the slurry wall (250 foot section) was replaced with sand backfill to an elevation of more than 7 feet. This segment is monitored for groundwater quality discharge to Mill Creek. (see Figure 2).

The ESD maintained the slurry wall containment remedy and added the construction of a supplemental isolation wall immediately south of the South 196th Street right-of-way. The isolation wall was constructed using a soil-cement-bentonite backfill material, which varied from the original slurry wall mix to ensure additional structural stability required to facilitate plans by the city of Kent to construct an embankment across the Site at the South 196th Street corridor for a major east-west arterial. The isolation wall was designed to continue to protect Mill Creek and the East Drain from remaining site contamination in Area I and to further reduce the groundwater pumping necessary to maintain containment. With the isolation wall, the area north of South 196th Street, Sector 4, was segregated from the Sector 1 source area.

Implementation of the monitoring program, including Mill Creek and East Drain surface water monitoring, began in January 1988. In April 1990, the cleanup achieved interim goals for Mill Creek. EPA issued an Interim Close-Out Report for the Site in December 1991.

Remediation of East Drain sediments took place in 1993; over 1,140 tons of sediment were disposed of off-site and gravel borrow was used as backfill. An interceptor system between the Interurban Trail and the East Drain was constructed; it included a well point extraction system installed in late 1993. The East Drain interceptor system operated for two years, beginning in November 1994. Use was discontinued in December 1996 as part of implementation of the containment remediation strategy and the elimination of the groundwater recharge system. The Trust completed work on the placement of a RCRA cap over Sector 1 (Figure 2) in 1999.

In 1999, EPA approved the transition of the Trans Plume Area (Sector 3) to MNA. In April 2000, extraction wells within the trans plume were shut off because geochemical conditions in the soils support biological reductive dechlorination of target VOCs. Monitoring of VOCs (TCE, cis-1,2-DCE and vinyl chloride) in the trans plume continues. Because Sector 1 field tests indicated that ongoing natural processes (intrinsic bioremediation) would not be significantly improved in this area by enhanced bioremediation, the technique was used only in Sector 3, the Trans Plume Area.

The 1995 ESD required treatment of another 5,000 cubic yards of contaminated soil. After the boundaries of the hot spot were determined to include over 5,000 cubic yards of the most contaminated soil, the areas were excavated and disposed of off-site.[11] The excavation was backfilled with lifts of clean gravel and crushed rock. Hot spot cleanup activities began in March 1997 and finished in October 1997.

The site decision documents did not select chemical-specific ARARs as performance objectives for the remedy to achieve. Instead, they developed site-, well- and contaminant-specific CACs, which are based on the historical concentrations at individual wells or sampling locations per contaminant and not based on MCLs. The Long-Term Contingency Plan identifies procedures for evaluating containment and actions to be taken if those procedures indicate a loss of containment (i.e., if CACs are exceeded) and was approved in March 2000, then updated in 2009. The Trust currently maintains the Site.

[11] Containing chlorinated VOCs higher than 10 mg/kg, aromatic VOCs higher than 20 mg/kg, TPHs higher than 10,000 mg/kg, and/or metals higher than 25,000 mg/kg.

APPENDIX I – DETAILED DATA ANALYSIS

Figure I-1: Average Groundwater Elevation in Sector 1

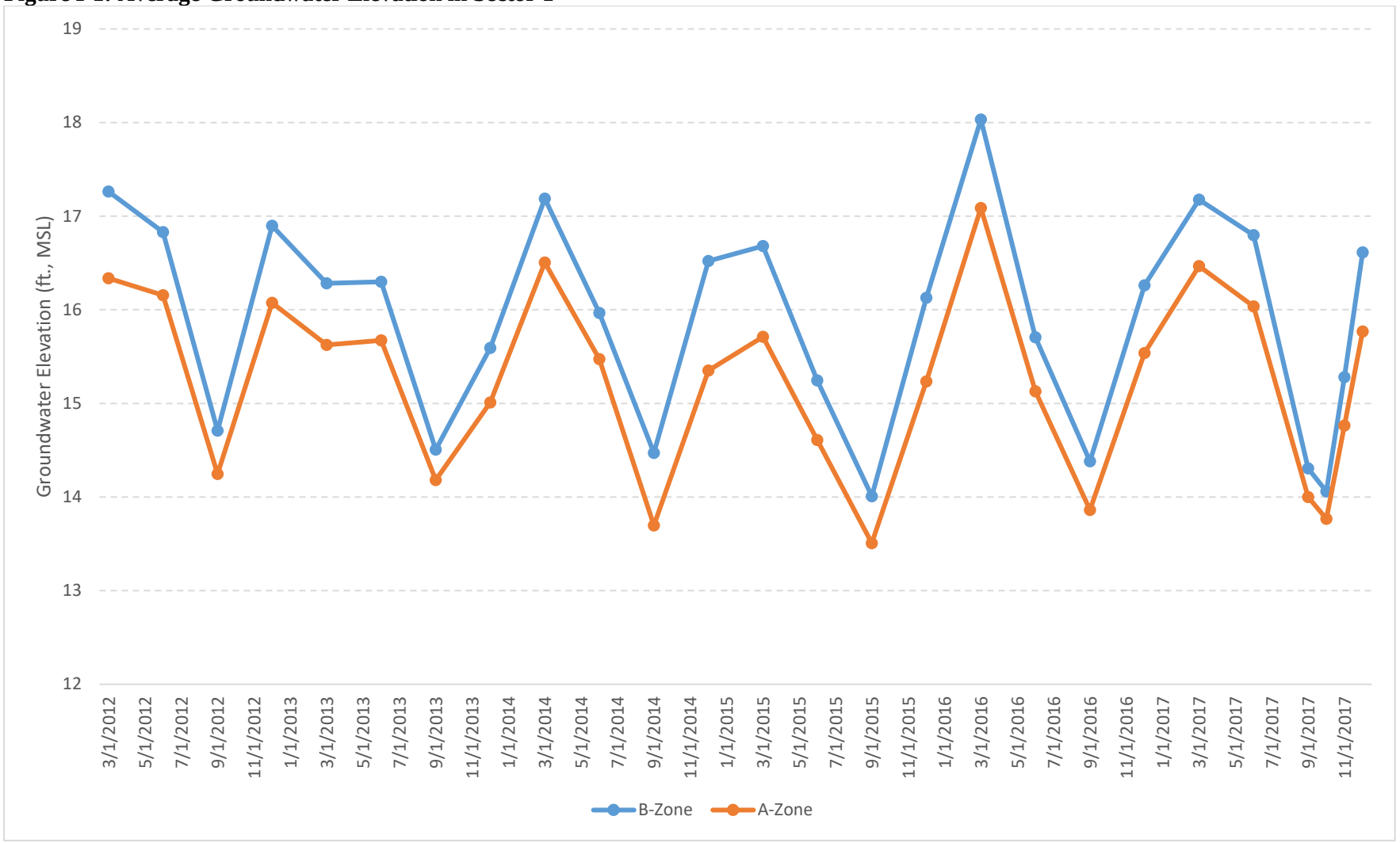


Figure I-2: Annual Gallons of Groundwater Extracted

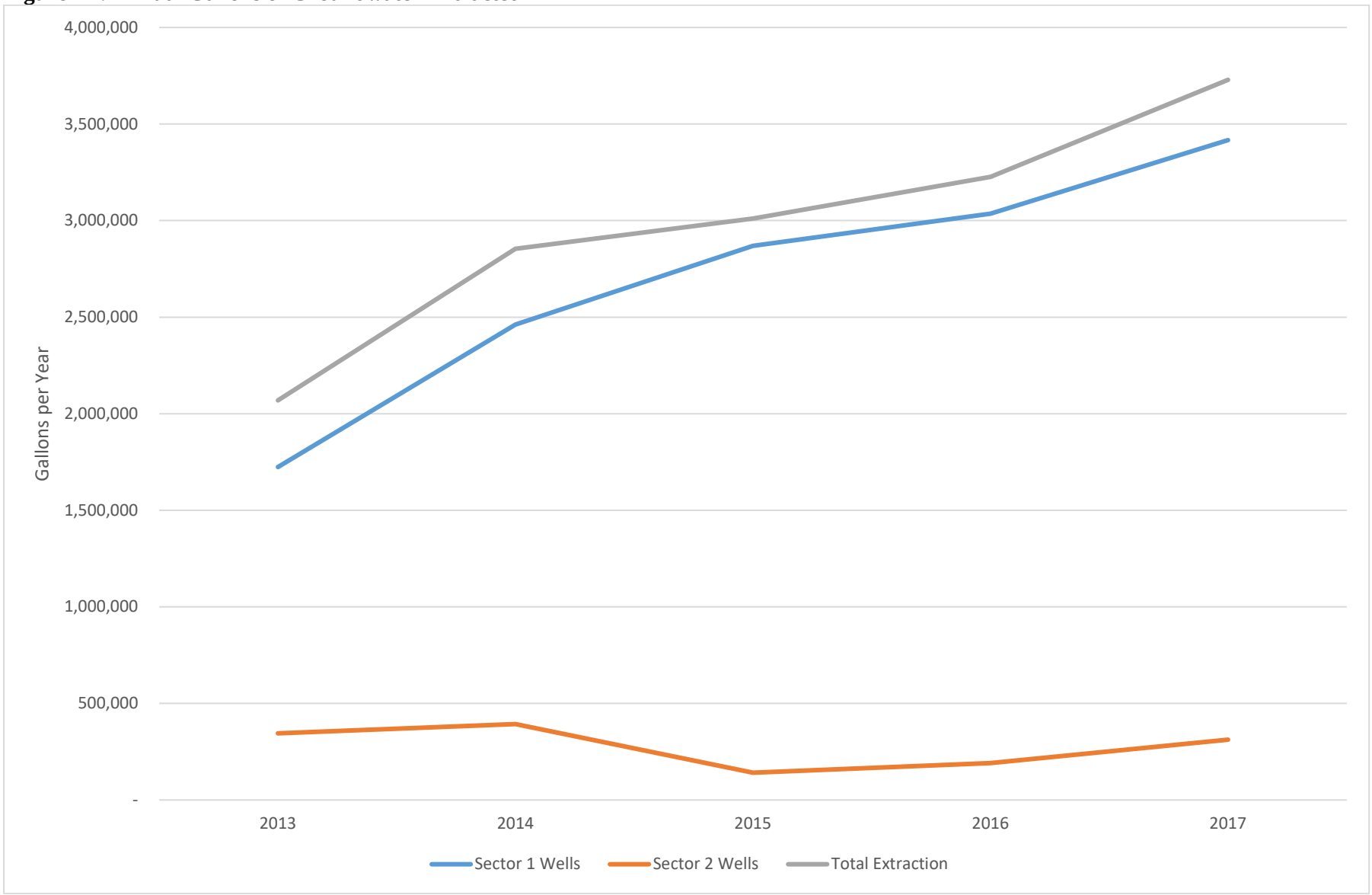


Figure I-3: Well 5M4A Historical Levels of HPMO, OPMO

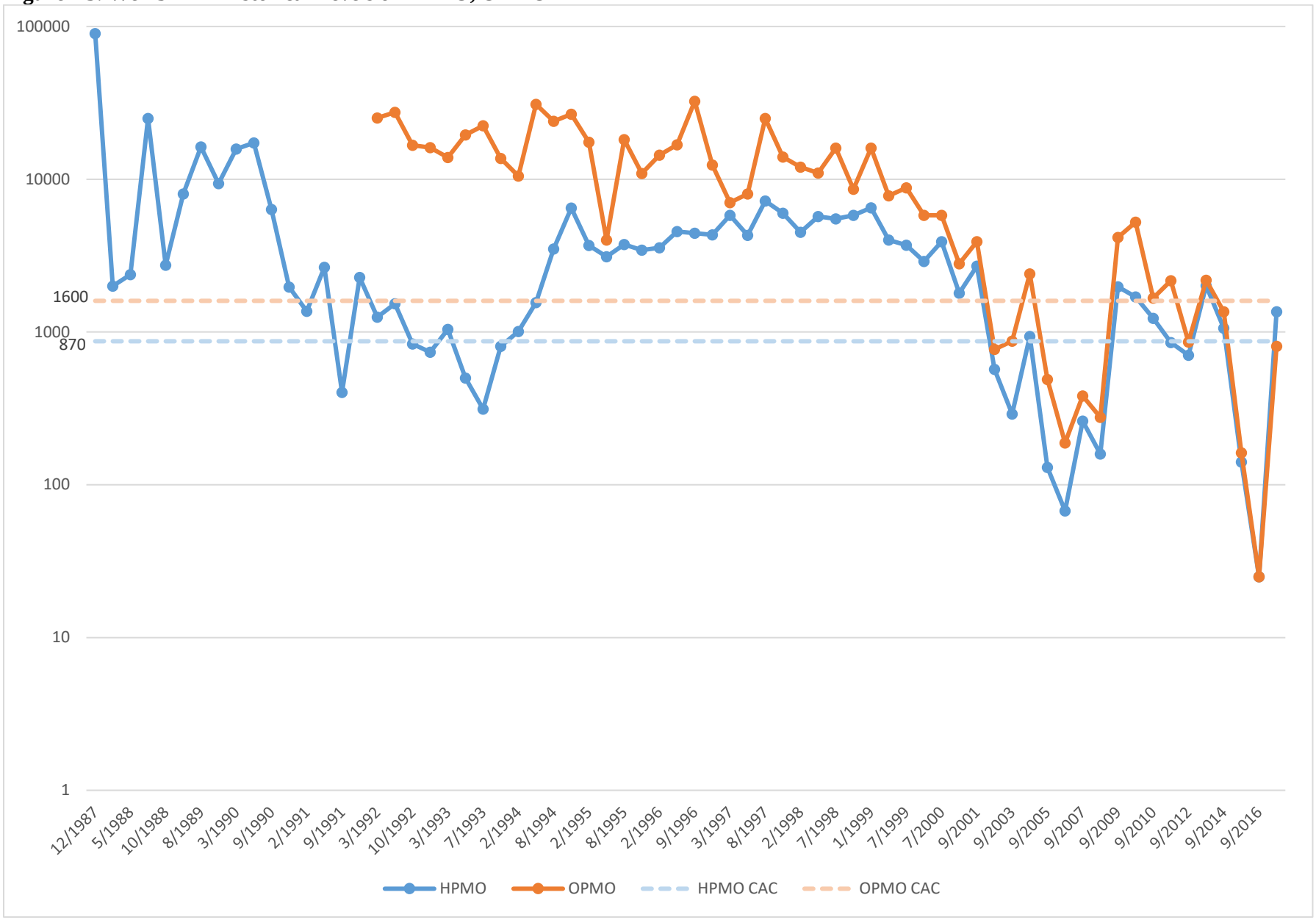
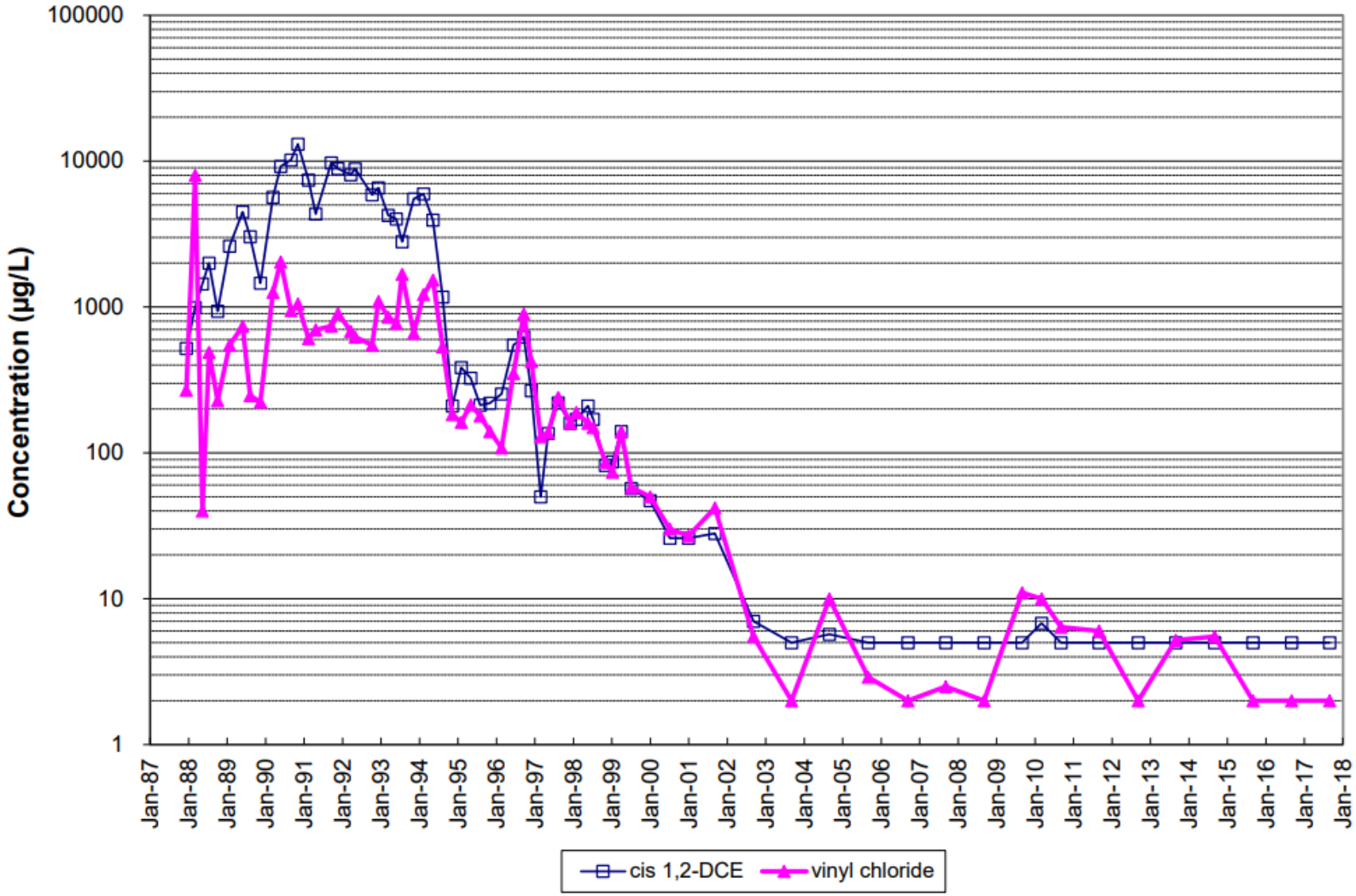


Figure I-4: Well 5M4A Historical Levels of cis-1,2-DCE and Vinyl Chloride from 2017 Annual Report



LANDAU ASSOCIATES

Western Processing Kent, Washington	**Well 5M4A cis-1,2-Dichloroethene and Vinyl Chloride**

Figure I-5: Well 9M44A Historical Levels of Zinc

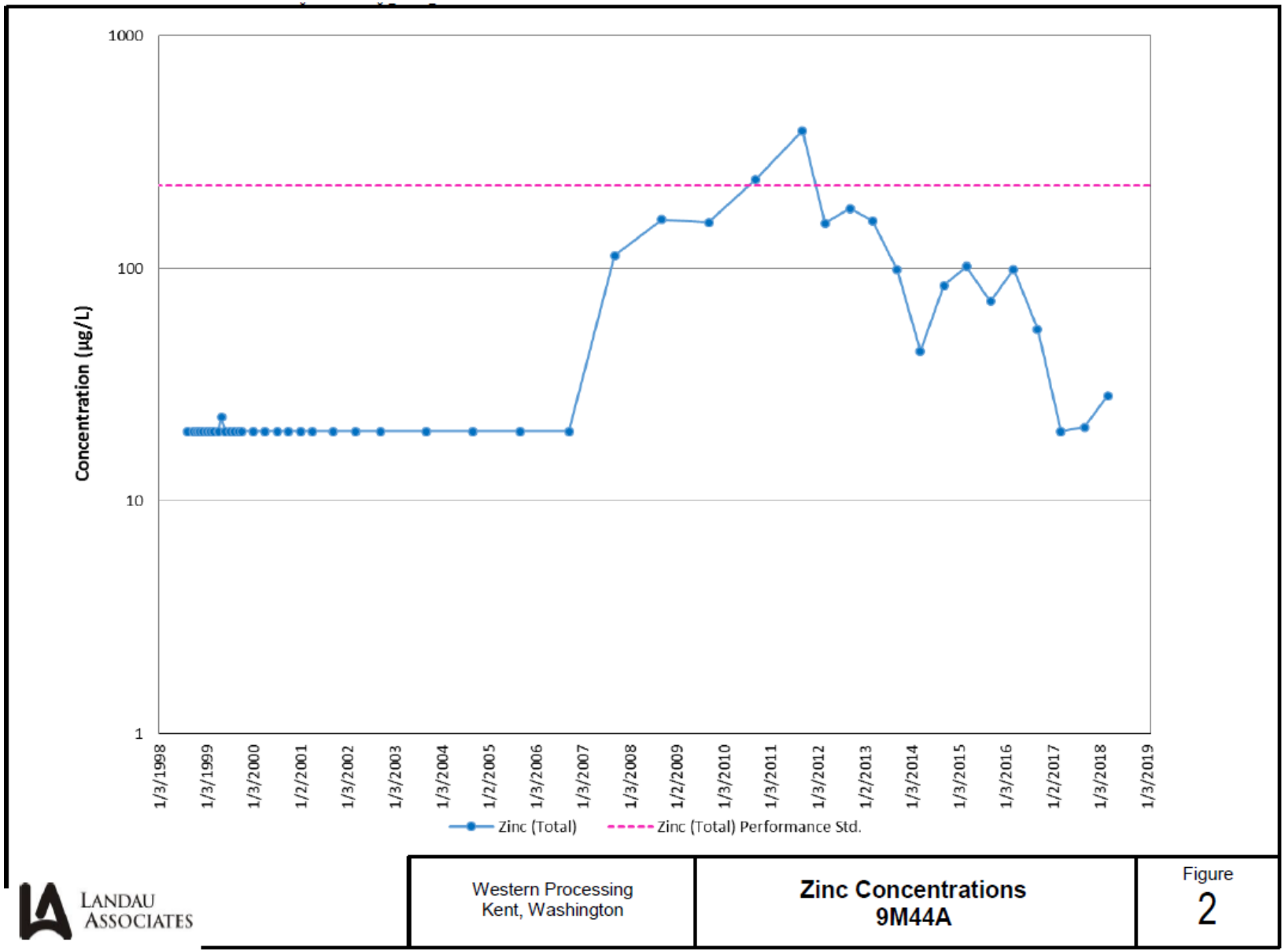
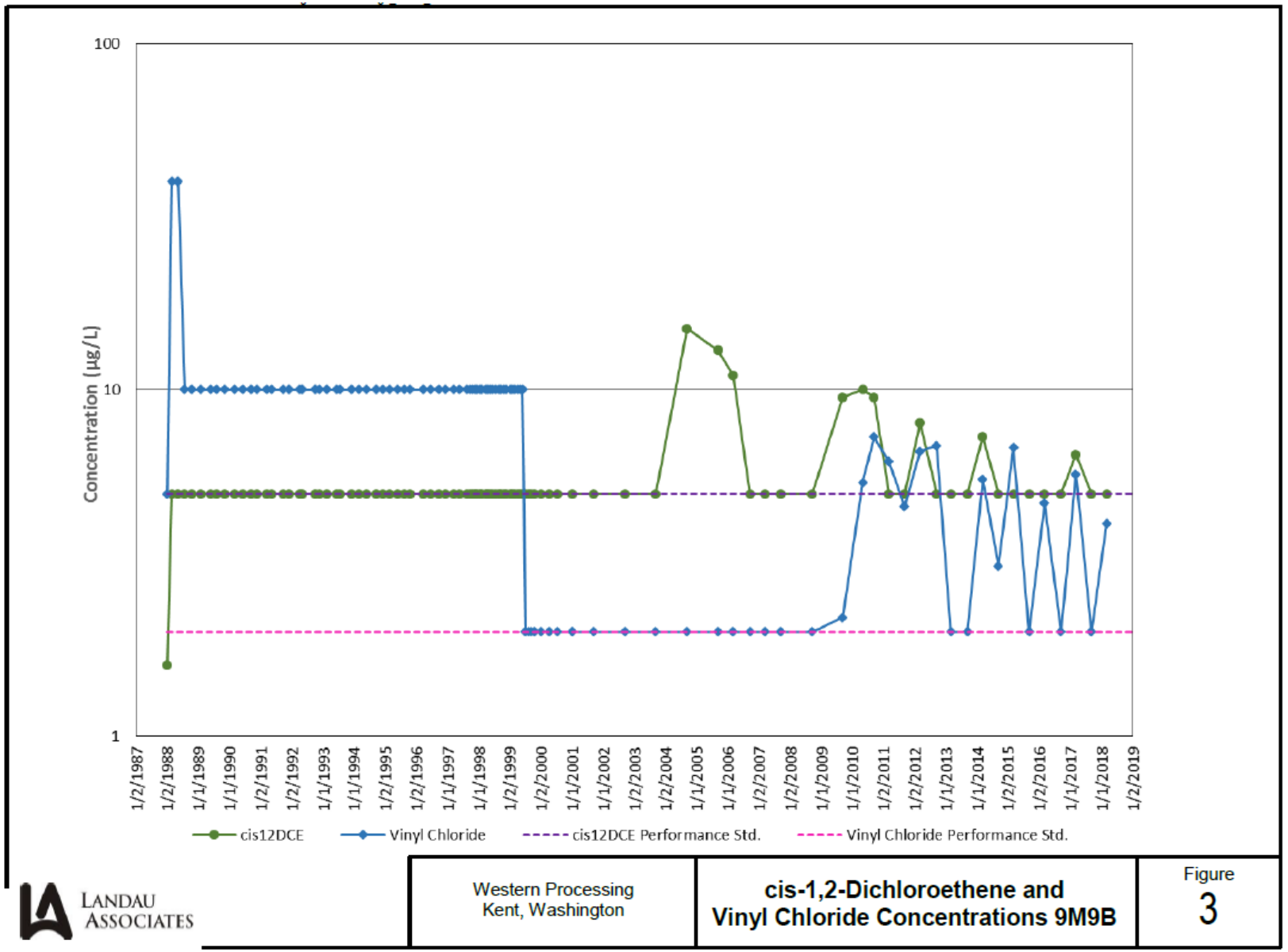
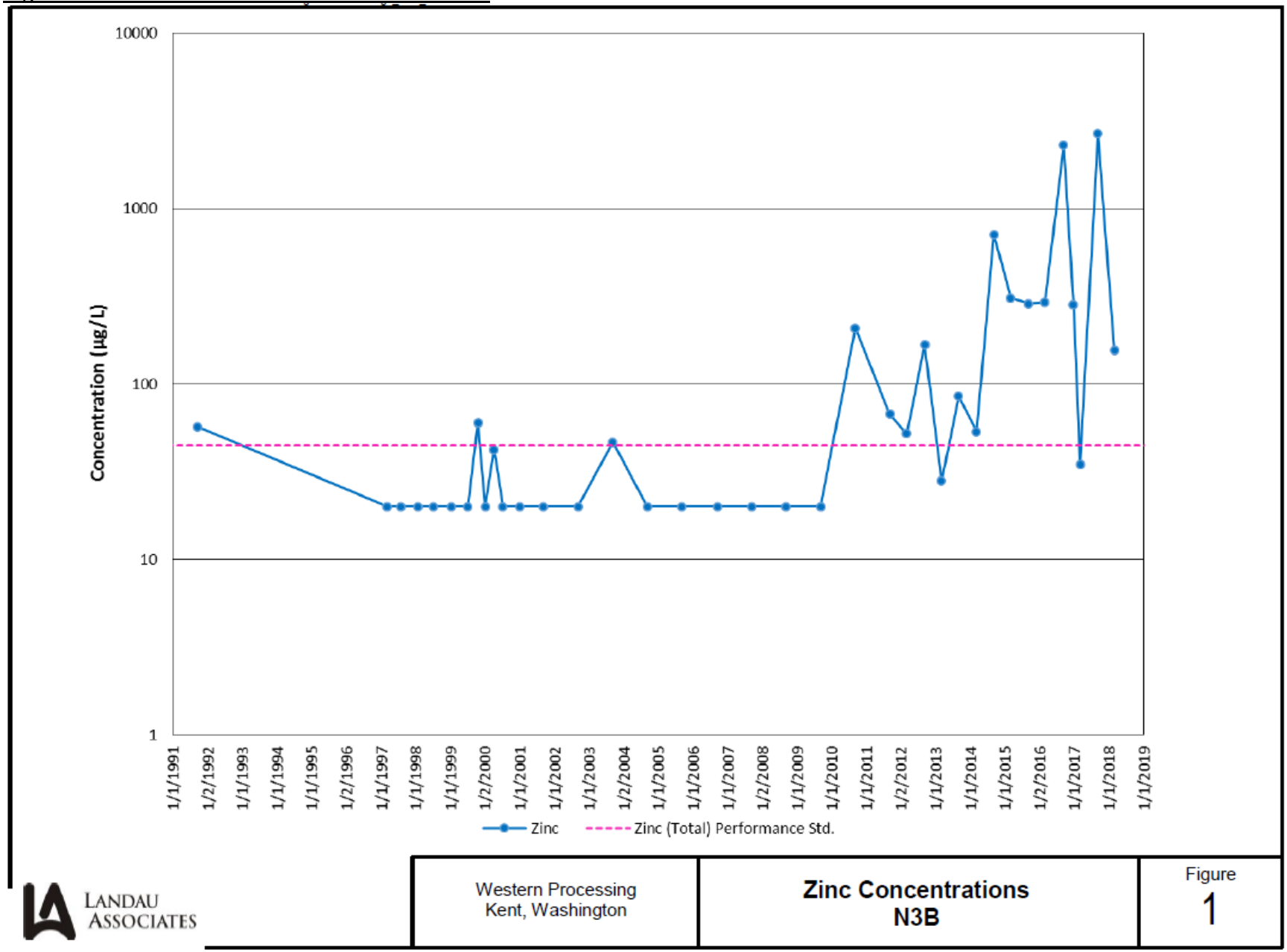


Figure I-6: Well 9M9B Historical Levels of cis-1,2-DCE and Vinyl Chloride



LANDAU ASSOCIATES	Western Processing Kent, Washington	**cis-1,2-Dichloroethene and Vinyl Chloride Concentrations 9M9B**	Figure 3

Figure I-7: Well N3B Historical Levels of Total Zinc



LANDAU ASSOCIATES

Western Processing Kent, Washington	**Zinc Concentrations N3B**	Figure 1

Table I-1: Groundwater Elevations (ft., MSL)

Date	SECTOR 1															
	P10	P12	P20	RP22	P26	RP28	P32	P34	P41	RP42	P48	P49	1M33B	P50	P53	P52
	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A
3/1/2012	17.13	16.66	17.18	16.66	17.18	15.95	17.55	15.94	17.80	16.96	16.96	16.60	17.04	16.98	17.18	16.37
6/1/2012	16.71	16.47	16.83	16.32	16.76	15.96	17.09	15.97	16.98	16.56	16.54	16.37	16.65	16.55	16.78	16.20
9/7/2012	14.63	14.48	14.62	13.38	14.58	14.31	15.04	14.38	15.31	14.39	14.40	14.30	14.53	14.42	14.64	14.31
12/4/2012	16.79	15.41	16.79	16.61	16.87	15.69	17.28	15.65	16.69	16.59	16.64	16.31	16.73	16.59	16.80	16.05
3/1/2013	16.15	15.30	16.16	15.52	16.29	15.47	16.66	15.51	16.23	15.93	15.99	15.76	16.12	15.97	16.21	15.65
6/4/2013	16.12	15.76	16.21	15.58	16.15	15.54	16.56	15.54	16.78	15.90	15.95	15.79	16.11	15.94	16.17	15.66
9/3/2013	14.29	14.14	14.28	14.11	14.50	14.23	15.16	14.27	14.37	14.16	14.26	14.13	14.33	14.20	14.41	14.05
12/3/2013	15.32	14.34	15.51	14.59	15.52	14.91	16.07	15.13	15.34	15.26	15.43	15.15	15.51	15.31	15.53	15.01
3/4/2014	17.13	16.58	17.17	16.60	17.26	16.35	17.35	16.24	16.93	16.86	16.99	16.68	17.10	16.88	17.13	16.41
6/24/2014	16.12	15.84	16.18	15.30	16.06	15.02	16.24	15.53	15.88	15.58	15.70	15.51	15.80	15.61	15.83	15.40
9/9/2014	14.29	14.28	14.37	13.11	14.41	13.46	14.91	13.61	14.45	14.29	14.31	13.88	14.27	14.20	14.38	13.40
12/3/2014	16.36	15.69	16.42	15.11	16.47	14.87	17.01	14.93	16.59	16.34	16.44	15.71	16.34	16.21	16.37	15.13
3/4/2015	16.66	16.47	16.39	15.66	15.98	15.27	17.13	15.34	16.80	16.53	16.68	15.96	16.56	16.39	16.59	15.52
6/3/2015	15.17	15.08	15.11	14.31	15.53	14.71	15.62	14.50	15.15	15.08	14.88	14.65	15.03	14.91	15.12	14.41
9/1/2015	13.75	13.45	13.85	12.95	13.87	13.25	14.42	13.55	14.38	13.88	13.90	13.78	13.81	13.72	13.93	13.34
12/2/2015	15.99	15.80	16.13	15.00	16.27	14.83	15.47	14.87	16.39	15.91	15.88	15.52	15.99	15.90	16.05	15.18
3/1/2016	18.03	16.60	17.74	17.17	17.37	16.71	17.21	16.67	18.86	17.92	17.32	16.99	18.02	17.97	18.08	17.06
6/1/2016	15.53	15.32	15.58	14.04	14.87	14.80	16.11	15.22	16.84	15.43	15.30	15.18	15.49	15.41	15.63	15.06
9/1/2016	14.24	14.19	14.22	12.75	13.44	14.25	15.94	14.20	15.53	14.05	13.90	13.65	14.17	14.02	14.18	13.77
12/1/2016	16.11	16.02	15.74	15.48	16.17	16.00	16.74	15.11	16.05	15.92	15.97	15.45	16.18	16.08	16.22	15.41
3/6/2017	17.27	17.10	17.15	16.99	16.86	16.14	17.78	16.25	17.39	17.12	17.16	16.60	16.04	16.74	17.38	16.64
6/1/2017	16.91	16.76	16.66	15.89	16.43	14.94	17.10	15.91	17.21	16.66	16.66	16.10	15.48	15.41	16.99	16.35
9/1/2017	14.27	14.25	14.27	13.83	13.73	13.57	14.87	14.63	14.46	14.18	13.97	13.68	14.13	14.03	14.30	14.01
10/4/2017	13.97	13.88	13.82	13.51	13.53	14.09	14.44	13.77	14.28	13.96	13.74	13.45	13.89	13.85	14.08	13.72
11/1/2017	15.11	14.42	15.22	14.49	14.75	14.93	15.64	14.32	15.24	15.19	14.97	14.42	15.12	15.67	15.28	14.72
12/1/2017	16.49	14.60	16.63	16.08	16.21	16.17	17.41	15.35	16.72	16.60	16.41	15.76	16.36	16.28	16.70	15.77
Average Elevation	15.79	15.34	15.78	15.04	15.66	15.05	16.26	15.09	16.10	15.66	15.63	15.28	15.65	15.59	15.84	15.18

Notes:

= Groundwater elevation in Zone B is lower than Zone A in piezometer pair.

Source: Data compiled from Table B-1 in 2017 annual report and Table B-1 in 2013 annual report.

Table I-1. Hydraulic Gradients (cont.)

Date	SECTOR 1															
	P54	RP8	P55	P56	N-1	N-1	N-3	N-3	N-5	N-5	N-6	N-6	N-7	N-7	5M4B	5M4A
	B	A	B	A	B	A-2	B	A-2	B	A-2	B	A-2	B	A-2	B	A
3/1/2012	17.42	16.04	17.25	16.86	17.32	15.74	17.31	16.33	17.33	16.34	17.28	16.43	17.07	16.82	17.23	14.72
6/1/2012	17.07	16.02	16.81	16.65	16.84	15.75	16.94	16.24	16.88	16.26	16.89	16.28	16.71	16.54	16.78	14.36
9/7/2012	14.92	14.34	14.62	14.57	14.65	14.20	14.80	14.51	14.72	14.37	14.75	14.37	14.50	14.49	14.63	13.13
12/4/2012	17.12	15.80	16.92	16.46	17.14	15.42	17.02	16.09	16.98	16.04	16.74	15.97	17.01	16.71	16.82	15.80
3/1/2013	16.52	15.56	16.34	15.97	16.20	15.17	16.39	15.74	16.31	15.66	16.33	15.71	16.42	16.22	16.22	14.85
6/4/2013	16.49	15.66	16.33	16.02	16.41	15.80	16.37	15.80	16.24	15.70	16.28	15.74	16.41	16.24	16.19	14.11
9/3/2013	14.75	14.25	14.47	14.36	14.55	14.40	14.63	14.37	14.48	14.20	14.56	14.17	14.62	14.49	14.46	13.36
12/3/2013	15.86	15.10	15.62	15.23	15.56	15.11	15.76	15.25	15.57	15.10	15.66	15.11	15.72	15.48	15.51	14.07
3/4/2014	17.50	16.47	17.20	16.66	17.38	16.15	17.28	16.56	17.17	16.37	17.19	16.51	17.00	16.76	17.21	16.02
6/24/2014	16.10	15.52	15.94	15.69	16.05	15.53	16.08	15.70	15.83	15.50	15.97	15.57	15.83	15.66	15.86	14.62
9/9/2014	14.74	13.62	14.47	13.64	14.73	13.54	14.57	13.80	14.45	13.68	14.47	13.56	14.25	13.70	14.46	13.36
12/3/2014	16.70	15.05	16.52	15.54	16.74	14.75	16.59	15.29	16.48	15.24	16.52	15.22	16.26	15.70	16.55	14.85
3/4/2015	16.98	15.42	16.82	15.90	16.83	15.25	16.84	15.66	16.67	15.56	16.75	15.60	16.53	16.02	16.68	14.82
6/3/2015	15.48	14.49	15.26	14.59	15.44	14.23	15.41	15.30	15.16	14.48	15.31	14.51	15.03	14.68	15.22	13.80
9/1/2015	14.18	13.34	13.92	13.49	14.04	13.35	14.23	14.02	13.97	13.52	14.10	13.43	13.81	13.52	13.98	13.54
12/2/2015	16.40	14.95	16.25	14.81	16.40	14.72	16.22	15.30	16.17	15.19	16.26	15.23	15.99	15.54	16.18	14.99
3/1/2016	18.35	16.80	18.38	17.49	18.39	16.71	18.18	17.14	18.22	17.08	18.29	17.15	18.03	17.57	18.06	16.38
6/1/2016	15.94	15.19	15.79	15.30	15.90	15.21	15.75	15.32	15.63	15.14	15.77	15.12	15.47	15.19	under construction	under construction
9/1/2016	14.49	13.88	14.33	14.03	14.48	13.96	14.36	13.97	14.22	13.86	14.33	13.83	14.05	13.83	14.21	13.57
12/1/2016	16.62	15.32	16.42	15.75	16.50	14.94	16.39	15.44	16.36	15.39	16.27	15.49	16.13	15.76	16.32	15.05
3/6/2017	17.68	16.38	17.66	16.95	16.53	14.97	17.55	16.61	17.49	16.57	17.41	16.69	17.15	16.73	16.34	15.01
6/1/2017	17.24	16.22	17.24	16.63	16.48	14.93	17.12	16.40	17.03	16.34	17.01	16.47	16.91	16.61	16.29	14.98
9/1/2017	14.58	14.08	14.42	14.20	14.48	14.02	14.43	14.16	14.31	13.98	14.29	14.02	14.17	13.99	14.22	13.35
10/4/2017	14.30	13.81	14.17	13.97	14.28	13.78	14.17	13.90	14.09	13.79	14.10	13.74	13.89	13.75	14.20	13.30
11/1/2017	15.49	14.77	15.44	15.04	15.59	14.66	15.43	14.92	15.37	14.77	15.34	14.76	15.03	14.80	15.46	14.35
12/1/2017	16.93	15.56	16.86	16.20	16.95	15.25	16.78	15.80	16.77	15.75	16.63	15.80	16.45	16.10	15.50	15.24
Average Elevation	16.15	15.14	15.98	15.46	15.99	14.91	16.02	15.37	15.92	15.23	15.94	15.25	15.79	15.50	15.78	14.47

Notes:

= Groundwater elevation in Zone B is lower than Zone A in piezometer pair.

Source: Data compiled from Table B-1 in 2017 annual report and Table B-1 in 2013 annual report.

Table I-2: Annual Vinyl Chloride Emissions, 2013 to 2017

Year	Total Emissions (lbs)
2013	4.43
2014	5.32
2015	5.48
2016	4.75
2017	6.07
Notes: Source: Table 3-8 from 2017 annual report.	

APPENDIX J – DETAILED ARARs REVIEW TABLES

There were no site-wide cleanup standards established for groundwater contaminants. The only contaminant cleanup standard established in the RODA required a cleanup level of 70 µg/L for the cis-1,2-DCE off-site plume. The site decision documents did not select chemical-specific ARARs as performance objectives for the remedy to achieve. Instead, they developed site-, well- and contaminant-specific CACs, which are based on the historical concentrations at individual wells or sampling locations per contaminant and not based on MCLs.

The 1986 Consent Decree states that the remedial goal for trans-1,2-DCE should be at or below 70 µg/L. Since the cis isomer of the 1,2-DCE was determined to be the relevant isomer since that time, compliance with the 1,2-DCE performance standard is currently interpreted to occur when the total 1,2-DCE (cis- plus trans-) concentrations remain at or below 70 µg/L. A review of current federal groundwater MCLs indicate this remedial goal remains valid.

Table J-1 presents groundwater contaminants at the Site and their respective federal MCLs.

Table J-1: Groundwater ARARs

Contaminant[a]	2017 MCL (µg/L)[b]
VOCs	
Clorobenzene	100
cis-1,2-DCE	70
trans-1,2-DCE[c]	100
Vinyl chloride	2

Notes:

a. Groundwater contaminants listed in Table 2-2 of the 2016 Annual Sampling Report.
b. National Primary Drinking Water Regulations available at: https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations (accessed 3/8/2018).
c. The 1986 Consent Decree states that the remedial goal for trans-1,2 DCE should be at or below 70 µg/L. Because the cis isomer of the 1,2-DCE was determined to be the relevant isomer since that time, compliance with the 1,2-DCE performance standard is currently interpreted to occur when the total 1,2-DCE (cis- plus trans-) concentrations remain at or below 70 µg/L.

µg/L = micrograms per liter

The 1986 Consent Decree designated AWQC for freshwater as the basis for surface water monitoring. The data review section of this FYR discusses current surface water quality in relation to these AWQC. Table J-2 presents surface water contaminants monitored at the Site and their respective AWQC.

Table J-2: Surface Water ARAR

Contaminant[a]	2017 Federal AWQC (µg/L)[b]
Cadmium	0.72
Lead	2.5
Nickel	52
Zinc	120
Chromium (Total)	74[c], 11[d]
Copper	NA

Notes:

a. Surface water contaminants listed in Table 2-5 of the 2016 Annual Sampling Report.
b. Federal Ambient Water Quality Criteria available at: https://www.epa.gov/wqc/national-recommended-water-quality-criteria-aquatic-life-criteria-table (accessed 3/8/2018).
c. There is no AWQC for total chromium, but there is an AWQC for chromium III, which is included in the table.
d. There is no AWQC for total chromium, but there is an AWQC for chromium IV, which is included in the table.

µg/L = micrograms per liter

NA = Not Applicable (no AWQC designated)

APPENDIX K – SCREENING-LEVEL RISK REVIEW

The 1985 ROD selected off-site soil excavation levels based on exceedances of Acceptable Daily Intakes (ADIs) for noncarcinogens or the 1 x 10^{-5} excess cancer level for carcinogenic contaminants of concern (COCs). The only COC where the ADI was exceeded was lead, and PCBs exceeded the 1 x 10^{-5} excess cancer level. For PCBs, the ROD selected a site-specific excavation level of 2 mg/kg. For on-site soils, the ROD selected a site-specific excavation level of 50 mg/kg. Table K-1 evaluates the current validity of these cleanup levels using 2017 EPA composite worker RSLs; the RSLs incorporate current toxicity values and standard default exposure factors. Composite worker RSLs are used because the anticipated future use of the Site is industrial/commercial.

Based on the evaluation, the excavation level for off-site PCBs remains valid because it is equivalent to a cancer risk that falls within EPA's acceptable risk management range of 1 x 10^{-6} to 1 x 10^{-4} and is below the target risk level for off-site soils of 1 x 10^{-5}. The excavation level for on-site PCBs remains valid because it is equivalent to a cancer risk that falls within EPA's acceptable risk management range of 1 x 10^{-6} to 1 x 10^{-4}.

Table K-1: Review of Soil Excavation Levels – Human Health Direct Contact

COC	Soil Excavation Level (mg/kg)	Composite Worker RSL[a](mg/kg)		Risk[b]	HQ[c] (Hazard Quotient)
		Cancer-Based RSL (10^{-6} Risk)[d]	Non-Cancer RSL (HQ = 1.0)[e]		
Total PCBs	2[e]	0.94	-	2.1 x 10^{-6}	NA
Total PCBs	50[f]	0.94	-	5.3 x 10^{-5}	

Notes:

a. EPA's composite worker RSLs, dated November 2017, available at https://semspub.epa.gov/work/HQ/197033.pdf (accessed 4/19/18).

b. Cancer risk calculated using the following equation, based on the fact that RSLs are derived based on 1 x 10^{-6} risk: cancer risk = (remedial goal ÷ cancer-based RSL) × 10^{-6}.

c. Noncancer HQ calculated using the following equation: HQ = (remedial goal ÷ noncancer RSL).

d. Soil excavation levels derived from ADI values in the 1985 FS.

Noncancer-based level:

Excavation level = ADI (mg/day) ÷ (ingestion rate x conversion factor for kg/gm)

= ADI ÷ (0.1 gm/day x 0.001 kg/gm)

e. EPA selected the excavation level as 2 mg/kg for off-site soils rather than the 1 x 10^{-5} risk-based level of 7 mg/kg calculated as follows:

Excavation level = Target risk ÷ Cancer potency factor x (lifetime daily intake x exposure fraction x conversion factor kg/gm)

= Target risk ÷ Cancer potency factor x (0.00082 gm-day/kg x 0.41 x 0.001 kg/gm)

f. EPA selected the on-site excavation level for PCBs to be 50 mg/kg.

NA = not applicable

- = EPA has not finalized a carcinogenic or noncarcinogenic toxicity value for this compound.

For groundwater, the site decision documents did not select risk-based cleanup levels as performance objectives for the remedy to achieve. Instead, they developed site-, well- and contaminant-specific CACs, which are based on one of the following: background concentrations, statistically based values (nonparametric prediction interval or a control chart limit) or the analytical reporting limit. None of the CACs were based on health-based criteria. To determine if the CACs are protective of human health, the CACs were compared to EPA's Regional Screening Levels (RSLs) for tap water which are health-based levels based on EPA approved toxicity values and default exposure assumptions for drinking water. In addition, the CACs were compared to the federal MCLs established for drinking water. As shown in Table K-2 below, most CACs fall within or are below EPA's risk management range of 1 x 10^{-6} to 1 x 10^{-4} except for vinyl chloride and chromium. The CAC for vinyl chloride is a statistically-based value which exceeds the upperbound of EPA's cancer risk range and the federal MCL. The CAC for chromium is below the MCL and the MCL remains current for chromium. Only two CACs, TCE and lead exceed

the noncancer hazard quotient (HQ) of 1. The CAC for lead is the background concentration thus, Superfund remediation cannot remediate to concentrations below background. The CAC for TCE is equivalent to the enforceable drinking water standard, the MCL. EPA is currently reviewing the MCL fpr TCE and in the interim the current MCL remains valid. Except for HPMO and OPMO, all indicators had an established toxicity value for carcinogenic effects or noncancer effects. EPA has not yet established health-based toxicity values for HPMO and OPMO, since these compounds are a relatively new class of antibiotics use to treat human health infections. Thus, these two compounds are not considered hazardous substances at this time. Based on this screening-level risk evaluation, even though four indicator chemicals exceed the RSLs (TCE, vinyl chloride, chromium and lead) the CACs remain valid because there are no current completed exposure pathways.

Table K-2: Risk Evaluation of Human Health-based Groundwater CACs

Indicator Chemical	2009 Maximum CAC (µg/L)	MCL (µg/L)	EPA Tap Water RSL[b] (µg/L)		Future Groundwater Use	
			1 x 10^{-6} Risk	HQ=1.0	Risk[c]	Noncancer HQ[d]
Benzene	5 rl	5	0.46	33	1.1 x 10^{-5}	0.2
Chlorobenzene	5 rl	100	-	78	-	0.06
Chloroform	5 rl	80	0.22	97	2.2 x 10^{-5}	0.05
1,2-Dichlorobenzene	10	600	-	300	-	0.03
1,1-Dichloroethane	5 rl	-	2.8	3800	1.8 x 10^{-6}	0.001
1,1-Dichloroethylene	5 rl	7	-	280	-	0.02
cis-1,2-DCE[b]	23 cc	70	-	36	-	0.64
Trans-1,2-dichloroethylene [a] (trans-1,2-DCE)	5 rl	100	-	360	-	0.01
Ethylbenzene	5 rl	700	1.5	810	3.3 x 10^{-6}	0.01
Methylene chloride	5 rl	5	11	110	4.5 x 10^{-7}	0.05
Styrene	5 rl	100	-	1200	-	0.004
Tetrachloroethylene (PCE)	5 rl	5	11	41	4.5 x 10^{-7}	0.12
Toluene	5 rl	1000	-	1100	-	0.004
1,1,1-Trichloroethane (1,1,1-TCA)	5 rl	200	-	8000	-	0.001
Trichloroethylene (TCE)	5 rl	5	0.49	2.8	1.0 x 10^{-5}	**1.8**
Vinyl chloride [b]	19 cc	2	0.019	44	**1.0 x 10^{-3}**	0.43
O-xylene	5 rl	10000	-	190	-	0.03
M, p-xylene	5 rl	10000	-	190	-	0.03
Metals						
Cadmium	6.8 bg	5	-	9.2	-	0.74
Chromium	44 np	100	0.035	44	**1.0 x 10^{-3}**	1.0
Copper	129 bg	1300	-	800	-	0.16
Lead	99 bg	15	-	15	-	**6.6**
Nickel (as soluble salts)	40 bg	-	-	390	-	0.10
Zinc	227 bg	0	-	6000	-	0.74
Oxazolidinones[d]						
HPMO	870 cc	-	-	-	-	-
OPMO	1600 cc	-	-	-	-	-

Indicator Chemical	2009 Maximum CAC (µg/L)	MCL (µg/L)	EPA Tap Water RSL[b] (µg/L)		Future Groundwater Use	
			1 x 10^{-6} Risk	HQ=1.0	Risk[c]	Noncancer HQ[d]

Notes:

a. The current EPA RSLs, dated May 2018, are available https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables (accessed 8/23/2018).

b. The cancer risks were calculated using the following equation, based on the fact that RSLs are derived based on 1 x 10^{-6} risk:

Cancer risk = (2009 Maximum CAC ÷ Tap water Cancer RSL) × 10^{-6}

c. The noncancer hazard index was calculated using the following equation:

Hazard Index = (2009 Maximum CAC ÷ Tap water Non-cancer RSL)

d. Class of antimicrobial agents or antibiotics used to treat infections however, screening criteria have not been established for these compounds.

HQ = noncancer hazard quotient

Bold = cancer risk exceeds 1 x 10^{-4} or the noncancer HQ of 1.0

bg – site background concentration

cc – based on a statistical control chart

np – based on a statistical nonparametric prediction interval

RL – laboratory reporting limit.

- = EPA has not finalized a carcinogenic or noncarcinogenic toxicity value for this compound

The lead cleanup goal of 1,000 mg/kg is based on outdated guidance. EPA OLEM Directive 9285.6-56 (May 17, 2017) recommends using the Adult Lead Methodology to assess lead risks from soil for the non-residential Superfund site scenarios. The recommended soil Preliminary Remediation Goal is 1,050 mg/kg which corresponds to a target blood lead concentration of 5 µg/deciliter. This updated goal is less stringent than the original cleanup goal, therefore the soil cleanup goal is still protective (Table K-3).

Table K-3: Screening-level Risk Evaluation of Soil Cleanup Goals – Industrial Scenario

COC	1988 ROD Cleanup Goal (mg/kg)	EPA Industrial Soil PRG[a] (mg/kg)
Lead	1,000	1,050

Notes:

[a] PRG is based on guidance from the 2017 Update to the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters

PRG = Preliminary Remediation Goal

APPENDIX L – ANNUAL PROPERTY NOTICE EXAMPLES

Example of Letter Type A

January 10, 2017
G1243-MG-1705

Holland Four LLC
16775 16th Ave NW
Shoreline, WA 98177

RE: Your property at 6912 South 196th Street, Kent, WA 98032

Dear Property Owner:

As you may be aware, a cleanup of groundwater and soil contamination has been ongoing since 1983 at the Western Processing Superfund site near your property in Kent, Washington. Although the majority of contamination has been removed from the site, low concentrations of heavy metals and volatile organic compounds remain in the groundwater in the vicinity of the Western Processing property. This groundwater does not pose a threat to human health because it is not a source of drinking water and other exposure routes do not normally exist. Cleanup efforts continue to reduce the extent and level of residual contamination through groundwater extraction and treatment, source control, and natural biodegradation processes.

While it is highly unlikely that a property owner such as you would pump groundwater from this area for any purpose or use due to the presence of a public water supply system in the area, such pumping could yield contaminated groundwater, cause spreading of the residual contamination, and interfere with the continuing cleanup efforts at Western Processing. Accordingly, we provide this notification annually to property owners in the vicinity of Western Processing as a reminder that King County regulations prohibit you from installing wells for the extraction and use of groundwater if there is a suitable public water supply within 1 mile of your property. Because the City of Kent operates a public water supply system within the area, you should use the Kent water system for your water needs. You must contact King County, the Washington State Department of Ecology, and the U.S. Environmental Protection Agency if you wish to install a well on your property.

These measures and this reminder are for your continued safety during cleanup efforts at the Western Processing site and to prevent interference with cleanup operations. We greatly appreciate your cooperation in support of our cleanup efforts. Your property address and mailing address have been obtained from public records available through King County, Washington. If you do not own the referenced property; if we do not have your correct name, property address, or mailing address; or if you otherwise believe that this letter was sent to you in error, please notify Michael Gleason of the Western Processing Trust. In addition, if you have tenants or other entities utilizing or managing the referenced property, please forward a copy of this letter to them or, if you prefer, contact Michael Gleason to forward this information.

Thank you for your attention to this matter. If you have any questions or comments, please contact Michael Gleason, or you may contact Ching-Pi Wang of the Washington State Department of Ecology at (425) 649-7134.

Sincerely,

Michael Gleason
Western Processing Trust Fund II
20015 72nd Avenue South
Kent, WA 98032
(206) 290-6576

January 10, 2017
G1243-MG-1701

Example of Letter Type B

City of Kent
400 W Gowe St.
Kent, WA 98032

RE: Your property at 7101 South 196th Street, Kent, WA 98032

Dear Property Owner:

As you may be aware, a cleanup of groundwater and soil contamination has been ongoing since 1983 at the Western Processing Superfund site near your property in Kent, Washington. Although the majority of contamination has been removed from the site, low concentrations of heavy metals and volatile organic compounds remain in the groundwater in the vicinity of the Western Processing property. This groundwater does not pose a threat to human health because it is not a source of drinking water and other exposure routes do not normally exist. Cleanup efforts continue to reduce the extent and level of residual contamination through groundwater extraction and treatment, source control, and natural biodegradation processes.

While it is highly unlikely that a property owner such as you would pump groundwater from this area for any purpose or use due to the presence of a public water supply system in the area, such pumping could yield contaminated groundwater, cause spreading of the residual contamination, and interfere with the continuing cleanup efforts at Western Processing. Accordingly, we provide this notification annually to property owners in the vicinity of Western Processing as a reminder that King County regulations prohibit you from installing wells for the extraction and use of groundwater if there is a suitable public water supply within 1 mile of your property. Because the City of Kent operates a public water supply system within the area, you should use the Kent water system for your water needs. You must contact King County, the Washington State Department of Ecology, and the U.S. Environmental Protection Agency if you wish to install a well on your property.

In addition, monitoring wells, clean cover soil, or other remediation measures are located on your property as part of the remediation implemented at the Western Processing site. Any excavation, earthwork, or other property improvement work that has the potential to disturb these features should be carefully planned and coordinated with the Western Processing Trust. Disturbance to these features must be promptly repaired.

These measures and this reminder are for your continued safety during cleanup efforts at the Western Processing site and to prevent interference with cleanup operations. We greatly appreciate your cooperation in support of our cleanup efforts. Your property address and mailing address have been obtained from public records available through King County, Washington. If you do not own the referenced property; if we do not have your correct name, property address, or mailing address; or if you otherwise believe that this letter was sent to you in error, please notify Michael Gleason of the Western Processing Trust. In addition, if you have tenants or other entities utilizing or managing the referenced property, please forward a copy of this letter to them or, if you prefer, contact Michael Gleason to forward this information.

Thank you for your attention to this matter. If you have any questions or comments, please contact Michael Gleason, or you may contact Ching-Pi Wang of the Washington State Department of Ecology at (425) 649-7134.

Sincerely,

Michael Gleason
Western Processing Trust Fund II
20015 72nd Avenue South
Kent, WA 98032
(206) 290-6576

APPENDIX M – EXISTING REGULATIONS RESTRICTING LOCAL GROUNDWATER USE

As stated in the 1999 Institutional Controls Work Plan, the following existing regulations restrict groundwater use at the Site and the surrounding areas:

King County Health Department regulations
These regulations provide that sites greater than 5 acres in size can install a well for the extraction and use of groundwater only if there is no suitable public water supply within 1 mile of that property. The City of Kent currently operates a public water supply network with water lines available to the area from both 72nd Avenue S., immediately south of the site, and S. 196th Street, which intersects the northern part of the site.

Washington State Department of Ecology
Ecology requires a water right permit for groundwater withdrawals of 5,000 gallons per day or more (RCW 90.40.050). Ecology also requires permits to drill any type of well. This permit is enforceable by fines against drillers, who would generally not assume the risk of drilling a well without a properly obtained permit. Ecology would not issue such permits based on the King County Health Department regulations discussed above.

Zoning and land use
The existing and probable future zoning and land use in the vicinity of Western Processing consists of commercial and light industrial operations that are likely to have little or no need for the withdrawal of groundwater for their operations. This, together with the enforceable King County Health Department regulations, suggests that the chance of groundwater development by business operations consistent with zoning and land use patterns around Western Processing is negligible.

Environmental permitting
Any type of land development, including most modifications to existing facilities in the vicinity of Western Processing, would be subject to building permits, grading permits, Shorelines Management Act, State Environmental Policy Act, and potentially other permitting processes. These provide yet another checkpoint against the use of groundwater within the vicinity of Western Processing.

SIXTH FIVE-YEAR REVIEW REPORT FOR WESTERN PROCESSING CO., INC. SUPERFUND SITE KING COUNTY, WASHINGTON

Prepared by

U.S. Environmental Protection Agency
Region 10
Seattle, Washington

---------- for

Sheryl Bilbrey, Director
Office of Environmental Cleanup

9/12/2018

Date