



DEPARTMENT OF  
**ECOLOGY**  
State of Washington

## **RESPONSIVENESS SUMMARY**

for

**Landsburg Mine Site**  
**October 11 – December 12, 2013 Public Comment Period**

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***Cleanup Consent Decree including Draft Cleanup Action Plan and SEPA  
Determination***

**Prepared by**  
Washington State Department of Ecology  
Northwest Regional Office  
Toxics Cleanup Program  
Bellevue, Washington

**March 2017**

Location: Ravensdale, King County, Washington  
CS ID: 60  
FS ID 2139  
Site Manager: Jerome B. Cruz  
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## More Information

The Consent Decree, Consent Decree exhibits (including cleanup action plan), SEPA Checklist and Determination of Non-Significance are available at:

Washington State Department of Ecology  
Northwest Regional Office Central Records  
3190 160th Ave SE Bellevue, WA 98008

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Hours: Tuesday – Thursday  
8:00 a.m. – 12:00 p.m.  
1:00 p.m. – 4:30 p.m.

The above documents and Responsiveness Summary including all original comments are also available electronically on the web at Ecology's Landsburg Mine site web page:

<https://fortress.wa.gov/ecy/gsp/Sitepage.aspx?csid=60>

### **Accommodation Requests:**

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## LIST OF ACRONYMS

ARAR	Applicable, Relevant and Appropriate Requirements
APA	Administrative Procedure Act
BIOSCREEN	BIOSCREEN Natural Attenuation Decision Support System
CAP	Cleanup Action Plan
CUL	Cleanup Level
CRC	Cedar River Council
CGTS	Contingent Groundwater Treatment System
DCAP	Draft Cleanup Action Plan
DNS	Determination of Nonsignificance
DOH	Department of Health
GMVUAC	Great Maple Valley Unincorporated Area Council
MTCA	Model Toxics Control Act
O&M	Operation & Maintenance
PLP	Potentially Liable Persons
POTW	Publicly Owned Treatment Works
RCW	Revised Code of Washington
RI/FS	Remedial Investigation/Feasibility Study
SEPA	State Environmental Policy Act
TCP	Toxics Cleanup Program
WAC	Washington Administrative Code

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## Executive Summary

The Washington State Department of Ecology (Ecology) held a comment period from October 11 through December 12, 2013 on the proposed environmental cleanup of the Landsburg Mine Site in Ravensdale, Washington. Ecology reviewed all the comments to the Draft Cleanup Action Plan. This response to comments (Responsiveness Summary) contains Ecology's answers and changes to the cleanup plan in response to input from the public, stakeholder groups, the City of Kent, and the Washington Department of Health (DOH).

The 2013 Draft Cleanup Action Plan (DCAP) proposed the following cleanup actions:

- Cover and contain the waste disposal area at the Site and cap it with soil that reduces infiltration by rainwater.
- Install early warning monitoring wells to find out if contamination is moving in groundwater and to be able to respond quickly to prevent it from moving off-site .
- Monitor groundwater coming from the Site for contamination.
- If contamination is detected in Site groundwater at certain trigger levels, PLPs will pump, contain, and treat any contaminated groundwater as described in the contingency plan. The treated water will be safely discharged to the sewer.
- Install infrastructure (cement pad, electrical connections, fencing, pipeline, and improved road access) to speed up the time needed to implement the contingency plan.
- Apply legal restrictions that restrict future land use, groundwater use, and any activities that could affect the cleanup remedy to protect human health and the environment.

In response to comments received, the final cleanup plan will be changed to:

- Increase how often the monitoring wells are tested to ensure that groundwater is protected over the long-term.
- Test groundwater for 1,4-dioxane in addition to existing list of chemicals that will be routinely monitored.
- Revise the triggers for the contingency plan, so that the PLPs will take the actions in the contingency plan sooner.
- Install additional performance monitoring wells to verify that contaminated groundwater is not leaving the Site.
- Ecology has agreed to incorporate the actions suggested by the Washington State Department of Health. These include the following:
  - Perform targeted private well surveys and test nearby private water wells annually for five years and re-evaluate if necessary.
  - Describe in the cleanup plan the public water systems that are near the site.
  - Collect water table data to better understand flow directions in the former mine.
  - Conduct additional testing of soils just outside the edge of the proposed cap.
  - Perform surface water testing at the former mine portals.
  - Change the depth of the proposed deep sentinel well at the north end of the site to provide better vertical coverage of the groundwater.

- Explain how the contingent treatment system will operate to prevent contaminated groundwater, if ever detected, from existing the Site.

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## **I. Introduction**

This document summarizes and responds to public comments received on the proposed Consent Decree and State Environmental Policy Act (SEPA) determination for the environmental cleanup of the Landsburg Mine Site located in Ravensdale, Washington (Site). The Consent Decree includes a cleanup plan describing the proposed remediation of this Site following the requirements of the Model Toxics Control Act (MTCA).

The Washington State Department of Ecology (Ecology) and the Potentially Liable Persons (PLPs) will enter into a legal agreement called a Consent Decree. The PLP Group includes Browning-Ferris Industries of Illinois, Inc., BNSF Railway Company, PACCAR Inc, Weyerhaeuser Company, TOC Holdings Co., and Palmer Coking Coal Company. Burlington Environmental Inc., a subsidiary of Philip Services Corporation or PSC, settled its liability under a 2003 bankruptcy settlement. Under the Consent Decree, the PLPs will agree to and will become legally obligated to clean up the Site in accordance with the Final Cleanup Action Plan (CAP). The CAP has been finalized after Ecology made minor revisions in response to public comments, as discussed below. The Final CAP will be an exhibit to the Consent Decree, which will be filed in King County Superior Court.

In 2013, the public was invited to review and comment on the draft Consent Decree and its exhibits.

Ecology made available the following documents for public review and comment:

- Consent Decree and exhibits, including the Draft Cleanup Action Plan (DCAP).
- SEPA Checklist.
- SEPA Determination of Non-Significance (DNS).

The initial comment period ran from October 11 through November 11, 2013. In response to a request from the City of Kent, the comment period was extended through December 12, 2013.

Ecology held a public meeting at the Tahoma Junior High School on October 24, 2013 to provide information and take comments. Twenty-one people attended this meeting. The public meeting included an open question and answer session. The question and answer session was designed to provide immediate responses to the public's questions and concerns.

In December 2013, the City of Kent asked the Washington State Department of Health (DOH) to evaluate the site characterization work. DOH completed their evaluation in November 2016, and recommended that Ecology conduct some additional work (add link to the health consultation report). Ecology and the PLPs have agreed on appropriate responses to many of DOH's recommendations.

This responsiveness summary provides Ecology's responses to all of the written comments received from interested parties during the comment period.

This document is organized into seven parts:

- 1) Site background
- 2) Cleanup Action Plan description
- 3) Summary of Public Involvement for Consent Decree
- 4) Comments received and Ecology's responses
- 5) Summary of DOH Consultation and Ecology's responses
- 6) Summary of changes to be made to the Final CAP
- 7) Compilation of all written comments and documents (Appendix A). The complete comment document from the City of Kent is also provided in an accompanying compact disc in Appendix A

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## **II. Site Background**

The Landsburg Mine Site is a former underground coal mine located approximately 1.5 miles northwest of Ravensdale in southeast King County (Figure 1). Due to the mining operations, the ground above the mined coal seam subsided, forming a long, narrow trench above the former mine (Figure 2). The northern half of this trench was used to dispose of a variety of industrial wastes during the late 1960s and late 1970s. Detailed records indicate that approximately 4,500 drums and 200,000 gallons of oily wastes were disposed of in the trench. Contaminants of concern, based on limited sampling of the northern trench area, include chromium, lead, PCBs (polychlorinated biphenyls), bis(2-ethylhexyl)phthalate, methylene chloride, TCE (trichloroethene), and petroleum hydrocarbons.

Environmental investigations began in 1990. In 1991, a number of accessible drums were removed from the site. The environmental investigations and groundwater testing conducted over the last 25 years indicate that groundwater discharging from the former mine is not contaminated. The surrounding geology and the results of remedial investigations beginning in 1994 indicate the wastes are confined to the northern trench and possibly within the mine workings beneath this area of the former mine. However, contamination from the wastes could still be released from the Site and transported off-site via groundwater, despite the fact that to date, no groundwater contamination has been detected coming from the former mine. The potential for any off-site migration of contamination is a concern because water from the mine discharges towards Cedar River and Rock Creek and because groundwater in the area outside of the Site is a source of drinking water.

Groundwater movement away from the Site generally occurs in all directions. However, it appears to be highly directional, i.e. flow is chiefly along the mine workings to the former mine entrances or "portals" located at the north and south ends of the subsidence trench. As a result, if contaminants were released, it would likely be to the north and/or south of the Site.

The focus of the investigative and cleanup approach has been to monitor the discharge points of the groundwater flow system. As a precaution, it is assumed that the wastes or their leachates could migrate out of the former coal mine from these points at some time in the future. This cautionary approach, while conservative, was adopted due to several factors including:

- the lack of groundwater impacts outside of the mined coal seam,

- high hydraulic conductivity within the mined-out seam,
- known discharge points for groundwater from the mine workings at the portal areas, and
- the geometry of the mined out seam with respect to surrounding geology.

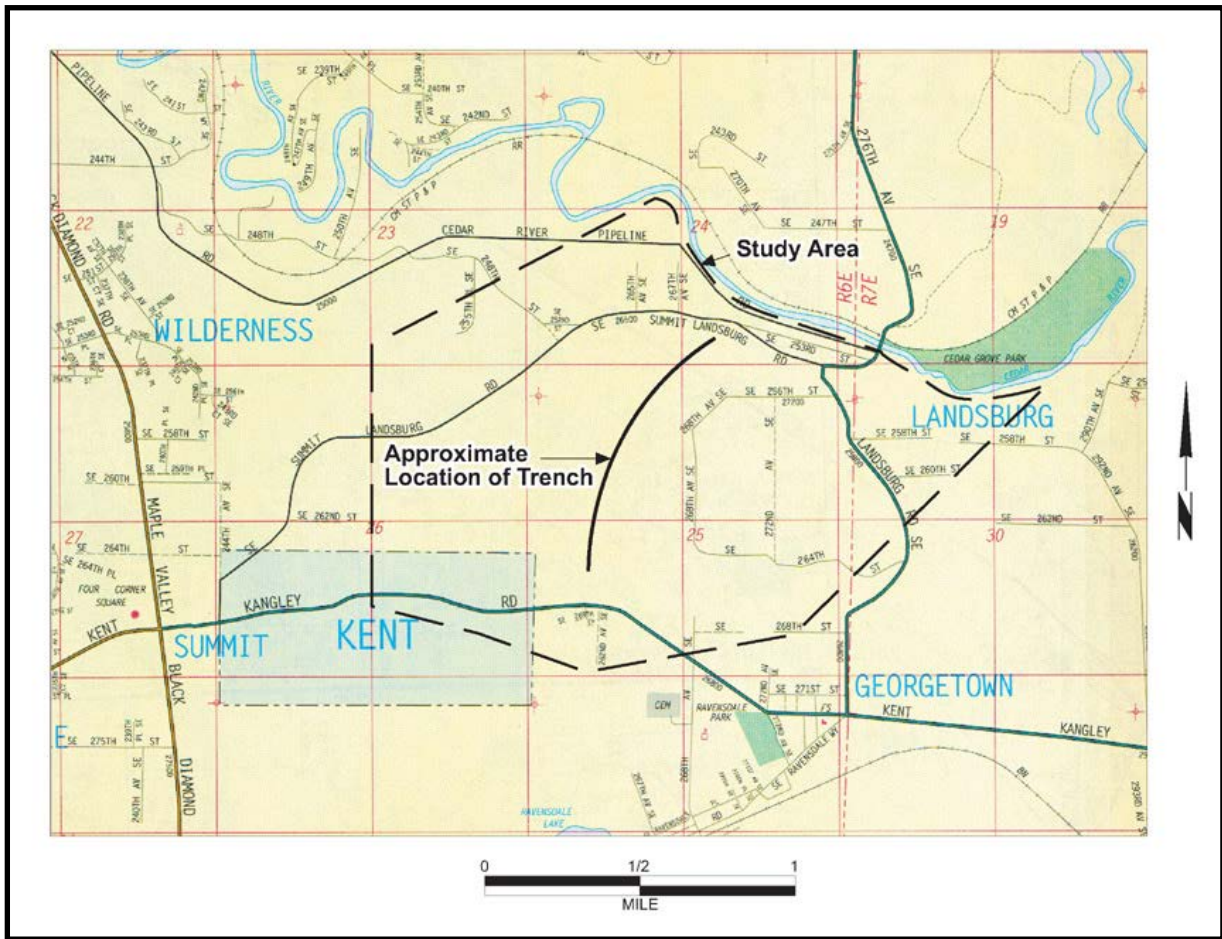
The Site has been under a MTCA Agreed Order since 1993. The Remedial Investigation/Feasibility Study (RI/FS) report was completed in 1996 after undergoing a public comment period. Ongoing semi-annual groundwater monitoring has continued through the present under the requirements of the 1993 Agreed Order. A public review version of the Draft CAP was completed in 2013. Following the MTCA process, the Consent Decree, including the Draft CAP, underwent a public comment period that began on October 11, 2013 and ended on December 12, 2013.

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### **III. Cleanup Action Plan (CAP)**

In order to protect human health and the environment, as required by MTCA, the following objectives will be met by implementing the remedial action as described in the 2017 Final CAP (which reflects changes to the 2013 DCAP as described in Sections VI and VII below):

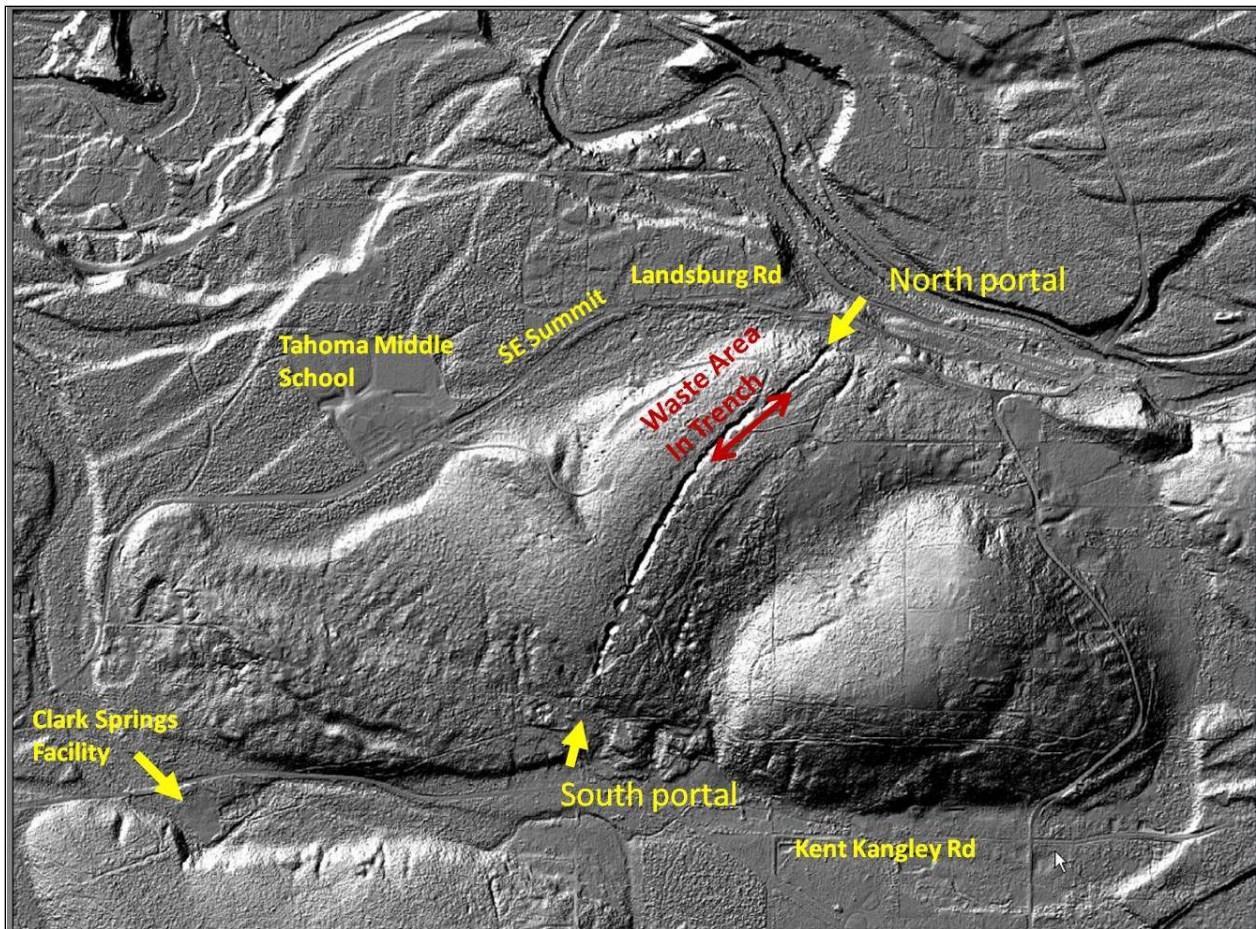
- Isolate and contain the wastes in the northern trench,
- Prevent or reduce leaching of the wastes by rain and groundwater,
- Reduce the amount of groundwater emanating from the mine, and
- Implement the contingency plan in the event contaminants are detected at a certain level in groundwater discharging from the former mine.



**Figure 1. Location of Landsburg Mine site**

Based on Site work, previous investigations, and limited physical surveys, it appears that the wastes are confined to the northern trench. Groundwater is the most likely pathway for any contaminants to migrate. To date, there have been no impacts to groundwater emanating from the mine at the Site. No contaminants associated with the historic waste disposal have been detected in over 25 years of groundwater testing. This cleanup action will:

- Cover the areas of known waste deposits,
- Monitor groundwater at the Site indefinitely
- Implement the contingency plan and detection system if certain triggering events occur, and
- Establish financial assurance for Operation & Maintenance and corrective measures.



**Figure 2. Lidar (Light radar) image showing the "bare earth" surface without trees or vegetation. Trench that formed above the former coal mine is linear feature between north and south portals.**

The Final CAP calls for covering the waste deposit areas in the northern portion of the trench with clean fill to bring the grade to the surface. A low-permeability soil cap, with vegetation, will be placed as the final surface of the trench to minimize water infiltration. This final surface will be graded to direct surface water away from the trenches. Long-term groundwater monitoring will be performed indefinitely to test for any contamination from the former mine.

The Final CAP also includes a Contingent Groundwater and Extraction Treatment System Plan that will be installed if the concentration of a Site-related contaminant is detected in any of the sentinel wells at or above the cleanup levels. The treatment system will be activated and operated if the contaminant concentrations reach or exceed one-half the cleanup levels at a compliance well. These more protective trigger levels were included in the Final CAP in direct response to public comments received on the DCAP. The system will include groundwater pumping to contain and prevent contaminated groundwater from leaving the Site.

The Final CAP also requires monitoring groundwater at the Site indefinitely and establishing financial assurance for Operation & Maintenance and corrective measures. The documents containing these additional requirements will be referenced throughout this document as follows:

- Compliance Monitoring Plan: Part A of Exhibit D to the draft Consent Decree
- Operation and Maintenance (O&M) Plan: Part B of Exhibit D to the draft Consent Decree
- Contingent Groundwater Extraction and Treatment System Plan (Groundwater Contingency Plan): Part C of Exhibit D to the draft Consent Decree

In those instances where changes to the 2013 DCAP were made in the 2017 Final CAP, whether in response to the DOH Consultation or public comments, the changes are described in the appropriate portions of Section V below.

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#### **IV. Summary of Public Involvement for Consent Decree**

Public Involvement activities at this Site have included the following:

- Publication of paid display ads in *King County Journal* on October 20, 2005 and February 2, 2006.
- Publication of notice in the Washington State Site Register, October 3, 2013.
- Distribution of a fact sheet describing the Site and the proposed cleanup through a mailing to approximately 4,715 addresses, including the Ravensdale community and other interested parties (mailed October 4, 2013).
- Dissemination of Press Releases announcing the proposed plan, comment period and public meeting. These press releases were sent to daily newspapers and broadcasters in King County, Kent/Renton/Auburn reporters, Voice of the Valley, Puget Sound Business Journal, King 5 television, and to subscribers who receive all of Ecology's news releases.
- Interview with the King 5 News Reporter Gary Chittim during a Site visit. Subsequently, King 5 broadcast its news piece on October 14, 2013 (see <https://fortress.wa.gov/ecy/gsp/DocViewer.ashx?did=61936> for video of newscast).
- Attending the monthly meetings of the Greater Maple Valley Area Council on October 7, 2013 and Cedar River Council on October 22, 2013 to announce the proposed cleanup and answer questions.
- Posting of the documents on the Washington State Department of Ecology (Ecology) website (<https://fortress.wa.gov/ecy/gsp/Sitepage.aspx?csid=60>) and announcements on social media
- Public meeting held on October 24, 2013 to present the cleanup and answer questions. "Flyover" video presentation that provides background and graphics of the site, made available during the public meeting and via Ecology's website.
- Providing copies of the above documents through information repositories at Ecology and at the Maple Valley Library.

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## V. Public Comments Received and Ecology's Responses

Ecology received sixteen (16) written comments on the 2013 DCAP from individuals and interested parties during the comment period. The submissions were from residents, area councils, and the City of Kent. Ecology reviewed all comments received. In this document, the written comments are summarized or quoted directly where appropriate.

**Table 1. List of Commenters**

Name	Date submitted:	Submitted as:
Gary Habenicht	10-24-2013	Email
Gordy & Leah George	10-24-2013	Sign-up sheet from 10-24-2013 public meeting
Jim Lee	10-24-2013	Comment from 10-24-2013 public meeting
Bill & Jane Nation	10-24-2013	Comment from 10-24-2013 public meeting
Gretchen Gibbs	10-27-2013	Email
Jon Parkinson	10-28-2013	Email
Craig Weinstein	10-28-2013	Email
John McTighe	10-24-2013	Comment from 10-24-2013 public meeting
	11-2-2013	Email
Sam R. Gallant	11-4-2013	Mailed comment form
Jason Howell	11-12-2013	Email
Brad and Becky Lake	12-5-2013	Email
Steve Hiester, on behalf of the Greater Maple Valley Unincorporated Area Council	12-11-2013	Email letter attachments
Larry Phillips and Reagan Dunn co-chairmen on behalf of the Cedar River Council	12-12-2013	Email letter attachment
Timothy LaPorte, on behalf of the City of Kent	12-12-2013	Email and hardcopy

A copy of the complete comment document by the City of Kent may be found in the accompanying compact disc in Appendix A, or may be viewed at Ecology Northwest Regional Office at the address listed on page 4.

Ecology grouped all the comments into related topics, as shown in Table 2. Ecology's response follows each comment.

**Table 2. Public Comments by Topic**

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F	Installing a Well in the Center of the Wastes/Disposal Area	<a href="#">24</a>
G	Covering Wastes (Containment Remedy)	<a href="#">25</a>
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Section	TOPIC	Page
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Z	Determination of Compliance Boundary for Groundwater Protection Area	<a href="#">59</a>
AA	Covenant Not to Sue and Contribution Protection	<a href="#">61</a>
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This responsiveness summary does not include requests for information by contractors on potential contracting opportunities in connection with the proposed cleanup, requests for contact information, or requests to be included in mailing lists, since those requests were not directly related to the contents of the DCAP and proposed remedial action.

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### **A. Private Well Testing**

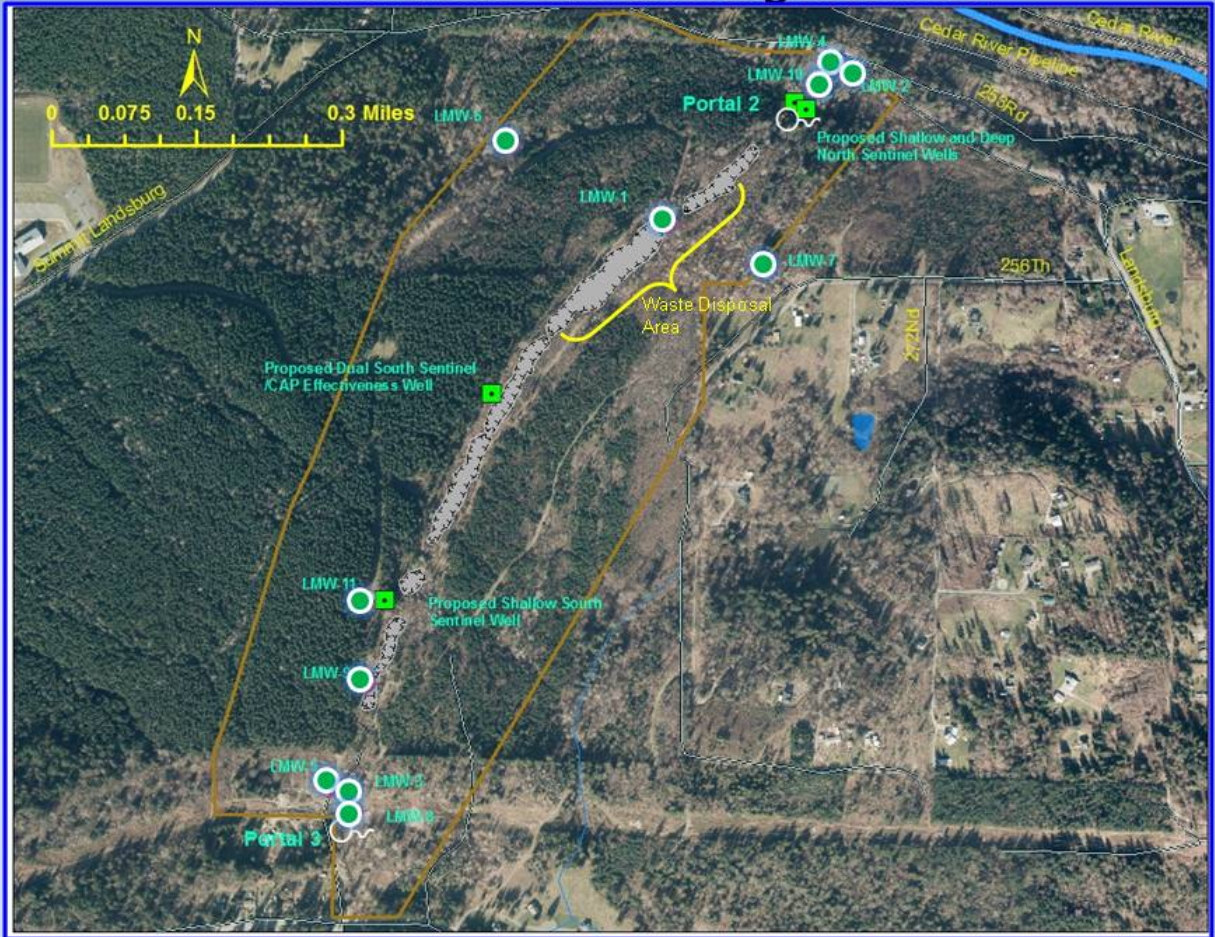
(Gordy & Leah George, Jim Lee, Bill & Jane Nation, John McTighe, Brad and Becky Lake, Cedar River Council)

Gordy & Leah George, Jim Lee, Bill & Jane Nation, John McTighe, Brad and Becky Lake and the Cedar River Council requested that private drinking water wells be tested for contaminants.

#### **Ecology's Response**

The requests for testing appear to be based on a concern that contamination from the Site has impacted surrounding groundwater, including private drinking water wells near the Site. Private well testing was done in 1992 by the Department of Health (DOH) and in 1994-95 for the remedial investigation (RI). No contamination was detected in private wells during either of these investigations. In addition, interim groundwater testing has been conducted at the Site since 2000, and continues to show no negative impacts to groundwater at the Site.

## Groundwater Monitoring Network



**Figure 3. Location of existing and proposed monitoring wells at the site.**

In 2014, Ecology responded to this concern by offering to test nine nearby private wells for the full suite of contaminants analyzed at the Site. Two owners agreed. In the fall of 2014, Ecology tested water in these wells for the same contaminants as those being tested for at the Site. Although the samples contained a few detections of common trace metals and in one well, substances called phthalates, no contaminants related to the Landsburg Mine Site were detected.

Furthermore, the detected contaminants were below state cleanup levels and EPA's maximum contaminant levels (MCLs) for drinking water. These substances are commonly found in drinking water and natural water. For the chemicals tested, Ecology considers the well water from those two wells to be as good or better than other public drinking water systems.

The on-site monitoring wells are also closer to the former mine than any of the surrounding private wells (see Figure 3). The Site wells are located in the immediate path where potentially contaminated groundwater could flow from the waste area. These wells will detect any contamination before it reaches the private wells.

In addition, in response to the recommendations made by DOH, the Final CAP has been modified to require testing of active private wells nearest the north and south portals annually for five years, for the same chemicals as the on-site monitoring wells. Ecology and the PLPs will re-evaluate the need for further private well testing during each five year periodic review.

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## **B. Wildlife**

(Gary Habenicht, Bill & Jane Nation)

Concerns were raised about the fate of wildlife (such as bears) that might live in the trench area. Mr. Habenicht contends that bears den there for the winter.

### **Ecology's Response**

The industrial wastes deposited in the northern mine trench contain hazardous substances or toxins that can threaten human health and the environment. This would include a risk to the health of wildlife through direct contact (exposure to soil and surface water in the waste area). By filling in the northern trench with clean fill and capping it with a low permeability cap, the remedial action will isolate the wastes (encapsulate it), prevent direct contact, and minimize the amount of water that could leach through the wastes. Over the long-term, this will protect wildlife that could otherwise be exposed to the hazardous substances.

Before infilling, there will be clearing and grubbing that may be expected to drive off wildlife that may be in the trench area. The Engineering Design Report (EDR) for the cleanup will address the appropriate measures such as using air horns to drive off wildlife during tree clearing and grubbing to avoid unnecessary impacts to wildlife.

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## **C. Property Values**

Bill & Jane Nation asked, “What happens to our property value?”

### **Ecology’s Response:**

Ecology has no knowledge of whether the property values near the Site have been impacted by proximity to Landsburg Mine Site. However, if property values have been impacted, property values typically recover after cleanup and Site improvements.

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## **D. Noise and Pollution**

Bill & Jane Nation expressed a concern about the noise level and an increase in pollution caused by the cleanup process.

### **Ecology’s Response:**

There will be a temporary increase in truck traffic and machinery operations at the Site and in the surrounding area during cleanup construction. Appendix B in the DCAP contains the SEPA checklist, which addresses these types of environmental health concerns.

Construction activities for the cleanup are not anticipated to occur for a period exceeding 6 to 8 months. The construction activities will be conducted during daylight hours. If on-Site sources of backfill are used, only minimal impact to public traffic is anticipated due to the majority of truck traffic being primarily confined to the Site. If off-Site material is used for backfill during the first construction phase, it is estimated that approximately 50 to 60 trucks will be hauling fill to the Site per day on public roads for 100 to 120 days over approximately 20 to 25 weeks during the first phase of construction. The amount of truck traffic during the second construction phase would be much less and should not pose a significant impact on public traffic.

The cleanup will be carried out under a Health and Safety Plan by workers properly trained for hazardous waste work. Standard engineering and operational practices will be used as needed to control fugitive dust from source material, excavation, hauling the clean backfill and cap materials, and placement of the materials within the trenches. The Health and Safety Plan will require protection monitoring during construction and will include air monitoring requirements for ensuring that the workers and off-site public are not exposed to potential Site contaminants. The Health and Safety Plan will be submitted for Ecology’s review and approval before construction activities begin at the Site.

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## **E. Site Characterization and Investigation**

(Gretchen Gibbs, Jon Parkinson, Craig Weinstein, Jason Howell, Brad and Becky Lake and the City of Kent)

1. The City of Kent commented that there has been little characterization of the Site and no waste characterization. Gretchen Gibbs, Jon Parkinson, Craig Weinstein, Jason Howell, Brad and Becky Lake stated that they did not believe that the characterization work conducted at the Site was sufficient for Ecology to accurately assess the potential risk to local schools, residents, and watersheds.

### **Ecology's Response:**

Ecology concluded that the Site investigation and characterization were adequate based on the results of the following investigations and technical assessments using empirically collected data and reliable data sources:

- 1990: Surface Water Sampling (Geraghty and Miller, 1990)
- 1990: Soil Gas Survey (Applied Geotechnology, 1990)
- 1991: Site Hazard Assessment (Ecology and the Environment, Inc. 1991)
- 1991: Emergency Drum Removal (Burlington Environmental, 1991)
- 1992: Interviews with mine personnel with firsthand experience during the period of disposal (Golder Associates Inc., January 1992)
- 1992: Private Well and Surface Water Sampling (State of Washington Department of Health, 1992)
- 1994-1996: Remedial Investigation and Feasibility Study (Golder Associates Inc., 1996)
- 2000 to Present: Interim Groundwater Monitoring (17 volumes of Landsburg Mine Site Interim Groundwater Monitoring Results) (Golder Associates Inc.)
  - 2004: South Portal Hydrogeologic Study: Installed and monitored three new wells (LMW-8, LMW-9 and P-2) at the southern end of the former mine to better understand hydrogeology.
  - 2004: Installed a deep well (LMW-10) (at approximately 300 feet depth) at the north portal area to monitor potential deep contamination migrating to the north.
  - 2005: Installed another deep well (LMW-11) (at approximately 700 feet depth) at the south mine interior to monitor potential deep contamination migrating to the south.
- 2005: Landsburg Mine—Formal Coal Mine Hazard Assessment (SubTerra, May 2005)
- 2006: Rogers Mine Groundwater Geochemistry Testing for Natural Attenuation Evaluation (Golder Associates Inc., April 27, 2006)
- 2009: Landsburg Potential Contaminant Adsorption Testing (assorted documents, Golder Associates Inc., 2009)
- 2008: BIOSCREEN Modeling for Determination of Protective Groundwater Monitoring Frequency (Golder Associates Inc., October 13, 2008)
- 2016 : Health consultation by DOH on site characterization. Ecology and the PLP Group made minor modifications to the DCAP in response to DOH's recommendations.

The above investigations and technical studies obtained sufficient information about the wastes and Site characteristics to allow Ecology to make a decision regarding the remedial action. For example, sampling and analyses of the soil and drum contents conducted during the 1991 Site Hazard Assessment (SHA) and Emergency Drum Removal established that wastes, waste area soils, and water in the trench contained hazardous substances in concentrations exceeding

MTCA cleanup levels. The SHA included the collection of 14 surface and subsurface soil samples from within the northern trench, surface water samples from two ponds, and liquid samples from three exposed drums.

In addition, sufficient investigation of the Site was carried out in the 1996 RI/FS to adequately characterize the Site for purposes of development and evaluation of cleanup action alternatives. The 1996 RI/FS included the following investigative activities:

- Phase I Site assessment
- Mine history and hazard assessment
- Air monitoring
- Source identification/location characterization in Rogers trench (geophysical surveys)
- Private well survey and sampling (including the Clark Springs water supply) for four quarters
- Monitoring well installation, including hydraulic tests and water level monitoring
- Quarterly surface and groundwater monitoring (sampling and chemical analysis)
- Surface soil sampling of trench rim and portal areas with bedrock fracture characterization
- Topographic survey and geologic reconnaissance

The soil sampling for the 1996 RI/FS was limited to the portal areas and trench rim because the interior trench area was previously sampled during the SHA and Drum Removal project in 1991. Undisturbed soil samples collected on the trench rim and in the portal areas showed no chemicals above natural background levels. Therefore, there was no need to expand the soil sampling program. The record of soil testing and analysis is presented in the final RI/FS report. Based on a recommendation by DOH, the Final CAP has been revised to require that additional soil samples be collected at the edge of the proposed cap and tested for volatile chemicals will be conducted.

The approach taken during the 1996 RI was to focus environmental sampling efforts on potential pathways of contaminants leaving the former mine and not on wastes present within the former mine itself. The presence of wastes in the trench is sufficiently known based on extensive review of disposal records, manifests, and interviews. This was in addition to in-trench sampling completed during the 1991 SHA. Further invasive investigations in the former mine were limited due to physical constraints and dangers. Record and Site investigation results indicated that the following wastes are isolated in the northern portion of the trench:

- An estimated 4,500 drums of waste
- Approximately 200,000 gallons of oily waste and sludge
- Wastes included paint wastes, solvents, and metal sludges

Site characterization must include hydrogeology to characterize aquifers, aquitards, groundwater flow directions, and for this Site, potential contaminant transport pathways. Detailed hydrogeologic investigations have concluded the following:

- Preferential flowpaths are to the north and south portals
- Vertically dipping bedrock layers on either side of the former mine greatly limit lateral or side flow

- Upward vertical gradients exist at the portal wells
- Precipitation is the primary source of groundwater recharge in the former mine

Subsequent to the 1996 RI/FS, other subsurface remedial actions were carried out that included the following:

- 2004: hydrogeologic investigation of the south portal
- 2005: installation of a 700-foot deep well in order to sample groundwater from the southern interior of the former mine

Results from periodic monitoring (conducted since 1996) continue to show no detection of contaminants in existing and new wells.

Based on the above work, Ecology concluded that sufficient characterization work was performed at the Site. Consistent with WAC 173-340-130(5) (“Scope of Information”) and WAC 173-340-350(7)(a), adequate information was gathered at the Site to determine a preferred cleanup alternative for the protection of human health and the environment.

2. Gretchen Gibbs, Jon Parkinson, Craig Weinstein, and Jason Howell suggested that Ecology consult with an independent third party to improve the groundwater monitoring plan for the Site and that the monitoring network use automated sensors for continuous sampling.”

**Ecology’s Response:**

Ecology experts, which include professional engineers, hydrogeologists, and chemists, have reviewed the Site investigation results and concluded that the Site is adequately characterized. Therefore, Ecology does not believe there is a need for an independent third party to review the information. The CAP is compliant with MTCA and is the best alternative for this Site. Please see Section I (below) for a discussion on the use of automated sensors.

Based on a request from the public, DOH completed a health consultation in 2016 which focused on site characterization work. DOH provided recommendations for the site characterization and cleanup plan, many of which Ecology has incorporated into the Final CAP. This consultation was carried out by DOH itself (a separate agency) and was a methodical technical review of the site characterization and cleanup plan.

3. Jason Howell commented that there is a lack of knowledge about the hydrodynamics of the Site and the surrounding area.

**Ecology’s Response:**

The groundwater flow system is well understood, as discussed above in Section E (1).

Furthermore, the Final CAP has been revised to require that additional sentinel wells be installed, which will provide a better understanding of the water level configuration within the mine, including the location of the groundwater divide located close to the south portal area. An effort

will be made to install the sentinel wells before the waste area in the trench is filled in and capped in order to collect baseline water level measurements.

4. Brad and Becky Lake requested that Ecology modify the assumption that the trench sidewalls are unlikely pathways for migration of contamination from the mine. They commented that crevices and seams in the surrounding sandstone formation transport a substantial volume of groundwater. In support, they noted that there are a number of wells in the area that can produce up to 30 gallons/minute from a depth of 300 feet or more.

### **Ecology's Response:**

Detailed Site investigations indicated that the sidewalls consist of vertically layered sandstones, shales, and siltstones, which have low permeability across bedding planes and therefore would not convey significant quantities of groundwater in this direction compared to what discharges at the portal areas. See section 3.6.3.2 in the 1996 RI/FS report<sup>1</sup>.

The reported higher groundwater production may be due to groundwater storage in the well casing rather than a sustainable yield from a hydraulically connected aquifer(s). High yields from wells in the area may also be due to other factors such as long well screen that taps into multiple aquifers or a local aquifer layer or seam interbedded with the lower permeability units further away from the Site. The latter may be the crevices and seams referred to in this comment.

The mine records and data do not indicate significant groundwater flow paths through the adjacent bedrock walls. The mine history, records, and data were gathered and compiled in a comprehensive study by SubTerra, Inc. (Landsburg Mine-Coal Mine Hazard Assessment, May 2005). The mine records contain detailed documentation of water infiltration into the mine and show that the amount of groundwater entering the mine from faults and fractures was minimal.

Furthermore, monitoring wells LMW-6 and LMW-7, located west and east of the disposal trench respectively, would detect any contaminants migrating across the bedding planes. To date, no contaminants have been detected in these wells, nor in any of the other Site wells.

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## **F. Installing a Well in the Center of the Wastes/Disposal Area**

Brad and Becky Lake suggested that additional wells be installed within and on the edges of the former waste disposal area in order to better characterize the waste and its associated contamination. They proposed that the wells should be drilled “to the full depth of the mine” and should include “casing perforations at 10-20 foot intervals.”

### **Ecology's Response:**

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<sup>1</sup> The 1996 RI/FS report can be downloaded at: <https://fortress.wa.gov/ecy/gsp/DocViewer.aspx?did=4382>



The requested well (containing casing perforations or well screens at multiple intervals along its length) may be interpreted as a nested well, which is prohibited under WAC 173-160-420(3). What follows below is a more thorough explanation as to why more intrusive investigations of the mine and the waste area were not carried out.

In 2004, Ecology held discussions with the City of Kent on site characterization and installation of deep wells in the former mine interior including through the waste area. In the same year, Ecology instructed the PLPs to install a 700 foot well within the southern deepest interior of the mine workings. The 700 foot well was installed because of the City of Kent's concerns over possible deep-seated contamination, which if released could impact the Clark Springs Water Supply (located west of the south portal of the Site). The volume of wastes estimated in the trench (4,500 55-gallon drums) and the amount of time that had passed since disposal of the wastes could allow for water to mix and circulate in the mine interior. Therefore, Ecology found it reasonable to expect that residual contamination would have been detected in groundwater within the mine if contamination was escaping the waste trench and infiltrating the deeper southern mine workings.

No contaminants have been detected in the 700-foot well. By installing this well in the mine interior, more reassurance on the water quality and level of risk at deeper levels of the Site was achieved. The deep well provided better characterization and a better perspective of the degree of risk from possible deep-seated contamination at the Site.

Ecology decided that installing an additional deep well in the waste disposal area was not essential for several reasons. No groundwater contamination is coming from the Site and the approach for the preferred remedial alternative, determined after the RI/FS, is to monitor the outputs of the former mine. Furthermore, given the results from the 700-foot well in the former mine's deep southern interior, drilling another well beneath the wastes would not provide additional value to the cleanup solution in this case. Hypothetically, even if such a well detected contaminants within the former waste disposal area, it is well established that the contaminants are not exiting the mine (possibly due to low contaminant source flux, attenuation, dilution/adsorption, and dispersion processes). Such a result would not change the preferred cleanup alternative in the DCAP.

Moreover, drilling through the wastes could create a new pathway for contaminants to migrate away from the Site. Please refer to Section K. "Monitoring Well Installation for Cap Performance Monitoring" for an explanation of risks associated with drilling into the wastes and with installing additional wells at the edges of the waste area.

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## **G. Covering Wastes (Containment Remedy)**

(Gary Habenicht, Sam R. Gallant, Jason Howell, City of Kent)

1. Gary Habenicht, Sam R. Gallant, and Jason Howell questioned the decision to cover and cap the wastes at the Site and whether a containment remedy constitutes a "true" cleanup given that hazardous wastes will remain on-Site. The City of Kent commented that "Ecology has failed to make, and cannot make, the determinations required by MTCA to

approve a containment remedy that leaves all hazardous waste in place at the Site forever.”

**Ecology’s Response:**

Ecology concluded that the waste containment by cover is the most appropriate remedy for the Site. Cleanup remedies like waste removal/retrieval are not feasible because it is physically dangerous at the Site, as described further in the next Comment/Response. Additionally, waste removal/retrieval at the Site fails the disproportionate cost analysis criteria under WAC 173-340-360. Ecology further concluded that it has sufficient information about the Site to select a cleanup remedy, in accordance with WAC 173-340-350(7). This allowed Ecology to determine that the most appropriate remedy is containment with long-term monitoring to confirm that the waste remains isolated in accordance with WAC 173-340-350(8) and -360.

The proposed remedy to backfill the areas where the wastes are located and capped with a low permeability cover is known as a containment remedy (an “engineered control”) and is a well-established cleanup alternative under MTCA. The RI/FS report details the data collection, rationale, and procedural determinations for choosing this as the preferred alternative for cleanup under MTCA. WAC 173-340-200 defines “Engineered Controls” as:

“containment and/or treatment systems that are designed and constructed to prevent or limit the movement of, or the exposure to, hazardous substances. Examples of engineered controls include a layer of clean soil, asphalt or concrete paving or other materials placed over contaminated soils to limit contact with contamination; a groundwater flow barrier such as a bentonite slurry trench; groundwater gradient control systems such as French drains or pump and treat systems; and vapor control systems.”

The Site’s containment remedy is designed to:

- isolate and contain the wastes to prevent direct contact,
  - prevent or reduce leaching of the wastes by channeling runoff from the trench and minimizing rainfall infiltration into the trenches containing waste; and
  - reduce the amount of groundwater emanating from the mine
2. The City of Kent asked Ecology to amend the DCAP to require the removal of chlorinated solvent sludge which they believe is "easily" accessible on the surface.

**Ecology’s Response:**

Ecology decided not to have the sludge removed for a number of reasons:

1. Physical hazards to the workers, such as sinkholes or mine collapse
2. The sludge area is not easily accessible since it is located at the base of the subsidence trench, which is between 20 to 60 feet deep and heavily vegetated.
3. A recent Site visit shows that the sludge area has been filled in with wood debris, vegetation, and soil.

4. Removal of the sludge could disturb the waste area and cause contamination to spread into the water table within the mine and subsequently to the outside environment.
5. The incremental environmental benefit of removing contaminants from the trench is outweighed by the costs and risks to the workers.

For these reasons, Ecology decided that the sludge should be part of the wastes being addressed by the containment remedy.

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## **H. Dewatering the Former Mine**

Brad and Becky Lake suggested that the CAP require continuous dewatering of the mine via a new well located within the former waste disposal area, for the duration of the Consent Decree. They commented that dewatering from the center of the former waste disposal area would prevent groundwater contamination from flowing out of the mine and into area groundwater. They also commented that dewatering would have the added benefit of requiring the “construction and operation of a waste treatment facility,” the lack of which is an “ongoing concern” of nearby residents and businesses.

### **Ecology’s Response:**

There is no substantial benefit to dewatering the former mine given the lack of contamination detected in groundwater discharging from the mine portals and the impracticality of pumping (and maintaining pumping) the large amount of water already contained within the mine workings (estimated at 75 million gallons). Pumping and disposing of 75 million gallons of potentially clean water and later maintaining pumping to keep the mine interior dry would be technically difficult to achieve with no added value over the proposed remedy. In addition, such an extent of groundwater withdrawal would have a negative effect on nearby water resources, which some neighbors expressed concern about. This would constitute a disproportionately extreme action with little to no incremental environmental benefit when compared to the selected remedy, especially given the lack of groundwater contamination discharging at the Site.

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## **I. Automated Groundwater Contaminant Monitoring**

(Gretchen Gibbs, Jon Parkinson, Craig Weinstein, Jason Howell, and the Cedar River Council)

Comments from several citizens and the Cedar River Council proposed the installation of automated instruments, which would provide continuous, 24-hour monitoring of pH, conductivity, total dissolved solids (TDS), and groundwater levels at the Site. According to the commenters, this would provide an early warning system in the event that contamination is detected at the Site.

### **Ecology’s Response:**

While in concept it appears to be a good idea, existing automated real-time technology does not

have the monitoring sensitivity to detect the set of contaminants at the concentrations required under MTCA and in the CAP.

Accurate and reliable measurements of chemical contaminant concentrations are needed to monitor groundwater at this Site. The existing method of groundwater monitoring at the Site detects chemicals in the parts per billion to parts per million concentration range. Use of pH, conductivity, TDS and groundwater levels would be misleading due to their natural variability in the groundwater. This natural variability would not be a reliable indicator of chemical contaminant concentrations.

Ecology is not aware of current technology available today that can monitor a wide range of specific contaminants in real time to parts per billion concentrations. Therefore, the installation of automated sensors will not be required in the CAP.

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## **J. Protectiveness of Long Term Monitoring Frequency**

(Jason Howell, Cedar River Council, City of Kent)

1. Jason Howell, Cedar River Council, and the City of Kent expressed concerns about whether the frequency of long-term groundwater monitoring (or time interval between testing) was protective; that the time between sampling was too long; and that contamination would not be detected and addressed prior to it reaching the nearby water resources.

### **Ecology's Response:**

There are two phases to the groundwater monitoring plan, short-term and long-term (See Table 3 below showing the original proposed monitoring frequency in the 2013 DCAP). Short term refers to the timeframe from start of construction to ten years after construction completion, with frequencies ranging from bi-weekly to yearly. Long-term monitoring refers to groundwater monitoring that will be conducted thereafter, with a frequency ranging from every 2.5 to 10 years.

**Table 3. Groundwater Monitoring Frequency in DCAP (July 31, 2013 Version)**

<b>Period</b>	<b>When</b>	<b>What</b>
CONSTRUCTION	Every two weeks	General parameters (pH, turbidity, dissolved oxygen, etc.
	Every month	General & Volatile organics
POST-CONSTRUCTION		
<b>Year 1</b>	Every three months	Full suite (1st round)
		Partial suite (rest of year)
<b>Years 2 to 5</b>	Twice a year	Full (1st round)
		Partial (rest of year)
<b>Years 6 to 10</b>	Once a year	Full suite
<b>Years 11 and beyond</b>	Once every 2 ½ years	Partial suite (North)
	Once every 5 years	Full suite (North) Partial suite (South)
	Once every 10 years	Full suite (South)

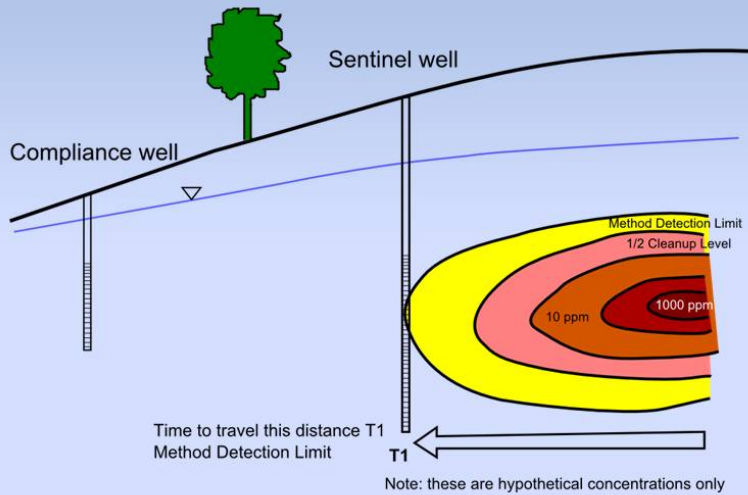
The monitoring plan in the Final CAP is protective for the following reasons:

- During remedy construction, groundwater monitoring is more frequent. At years 11 and beyond (see Table 3), monitoring is less frequent because of the large amount of time it would take for contamination to travel between the sentinel wells (located closer to the areas of waste disposal) and the compliance wells—a minimum of 2.5 years. Thus, by using both sentinel and compliance wells, more time between sampling rounds assures that any contaminants will be detected in time for the Contingency Plan to be implemented effectively.
- The results of BIOSCREEN modeling (a computer model for contaminant travel) indicated that, depending on the direction of flow, sampling at frequencies ranging from approximately every 2.5 years to every 10 years would detect a possible contaminant release in time to initiate the Contingency Plan before contamination leaves the Site.
- The BIOSCREEN modeling was highly conservative in order to ensure protectiveness. It used the most mobile organic compounds and metals, assumed no natural degradation that would otherwise attenuate contaminants during transport, and used high source concentrations. The BIOSCREEN travel time modeling indicated that the frequency for full testing was protective, for the full suite of analytes, in detecting potential groundwater contamination that could come from the waste area. As shown in Table 3, the Final CAP also includes partial testing of the more mobile analytes more frequently,

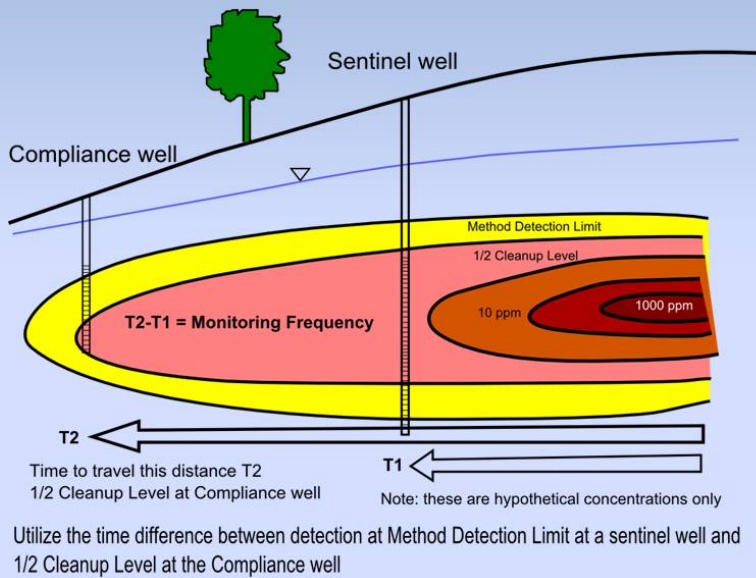
- as an added safeguard in the long-term monitoring program.
- The Site has not had any detections of contaminants or their residue in groundwater emanating from the mine for over twenty-five years. In such a case, model calibration should take into account this absence of detections or incorporate this as a minimum time of potential arrival for the mobile constituents used in the BIOSCREEN model at particular well locations. For instance, if contaminated groundwater were escaping the mine, modeling results indicated that all the modeled constituents should have been detected in the north compliance wells, while methylene chloride, vinyl chloride, and 1,4-dioxane should have been detected in the southern Site wells. Therefore, the travel times estimated by the BIOSCREEN modeling may be unrealistically short, resulting in overly frequent groundwater monitoring frequencies. By adopting this conservative approach to modeling and using early warning sentinel wells, Ecology believes this adds additional safeguards into the monitoring plan.

Figure 4 illustrates the concept of sampling frequency using both “early warning” sentinel wells and compliance wells. Please see Ecology’s response in “2.” below for a more detailed description of the method/model used to determine monitoring frequencies.

BIOSCREEN simulations were used to compute hypothetical travel times of contaminants in the possible event of a release within the mine



Combining simulated travel times with sentinel wells make the frequency of long-term monitoring protective and practical



**Figure 4. Schematic showing how monitoring frequencies were derived using travel times at sentinel wells and compliance wells. The time difference between T2 and T1 allows for early detection and response should a release occur.**

Despite Ecology’s confidence in the existing level of protection of the monitoring frequency, Ecology understands the public’s desire to conduct long-term monitoring more frequently. Ecology also believes that more frequent monitoring at the south sentinel and compliance wells will support more robust 5-year periodic reviews under MTCA and the Consent Decree. Ecology therefore revised the Final CAP to have all analyte parameters monitored at a frequency of once every five years at the south sentinel and compliance wells, instead of once every 10 years, during long-term groundwater compliance monitoring. Ecology also revised the Final CAP to trigger increased monitoring frequency requirements whenever confirmed sample results at a sentinel well exceed ¼ of the cleanup level (as opposed to confirmed samples at a compliance well). The following Table 4 illustrates Ecology’s revisions to the monitoring frequency that was in the DCAP (see Table 3 above) for monitoring after the first 10 years and in the possible event of a detection at a sentinel well.

**Table 4. Additional Revisions to the Monitoring Frequency in DCAP are added to Final CAP (2017)**

<b>Period</b>	<b>When</b>	<b>What</b>
<b>Years 11 and beyond (long term monitoring)</b>	Once every 2 ½ years	Partial suite (North)
	Once every 5 years	Full suite (North) Full suite (South)
<b>If at any time a sentinel well detects contaminants above ¼ cleanup level</b>	<b>Increased frequency (Table A-3 in compliance monitoring plan)</b>	<b>Detected contaminant(s)</b>

2. Jason Howell questioned the use of BIOSCREEN modeling software to determine the frequency of sampling events and suggested conducting an “empirical” study such as a dye-based study.

The City of Kent commented that the required frequency of sampling events is based on speculative assumptions and is not sufficiently protective.

**Ecology’s Response:**

Dye studies were considered early in the investigation, but were not pursued due to unreliability issues when used in a subsurface environment with a substrate containing highly adsorptive capacities (coal and clay), and dilution effects due to the high permeability and water content in the mine workings.

The BIOSCREEN model is a well-established model for contaminant transport and is an appropriate method for determining monitoring frequency. The BIOSCREEN program is a widely used screening and predictive modeling tool with simple, rapid operation and fairly



accurate results that allow for multiple transport simulations. The contaminant travel modeling (using BIOSCREEN) carried out in 2009 used protective (conservative) parameters that simulated worst-case scenarios for potential transport of contaminants in the groundwater. This included using the most mobile (fastest) contaminant chemicals, fast-moving groundwater speeds and rock permeabilities, no degradation (natural attenuation) of these compounds (which normally occurs during transport), and high contaminant source concentrations (which would provide a continuous source of contamination rather than a finite one as would occur in real life). The resulting monitoring frequencies are protective based on these modeling results.

In the Final CAP, sentinel wells will be part of the monitoring network. Sentinel wells are located closer to the wastes than compliance wells in order to provide early detection of any potential contaminant release. BIOSCREEN modeling results indicate that it will take years before a cleanup level is reached at the compliance wells for even the most mobile contaminants. The amount of time ranges from a minimum of three years to 142 years using ultra-conservative parameters. The modeling results provided the framework for a very protective monitoring frequency, which will ensure that potential groundwater contamination is detected before cleanup levels are exceeded at the points of compliance. This was accomplished by using the difference between the time it takes a potential contaminant to reach the sentinel well at Method Detection Limits (MDL) and the time it takes to reach the compliance well at ½ of the Cleanup Level (CUL). See Figure 4 schematic.

Using this approach, any release of contaminants at the waste area at any unknown time in the future will be detected before cleanup levels are reached at the point of compliance. This will give the PLP Group the time needed to verify results, finalize the design, and install and operate the Groundwater Extraction and Treatment System to prevent contaminant migration from the Site.

The City of Kent participated in the BIOSCREEN modeling effort. The City of Kent and the PLP Group provided model input parameters based on each party's conceptualization of the hydrogeology of the Site. Ecology chose the model input parameters from each party's submittal and focused on those parameters which were more conservative and practical. The results of the modeling effort represent a very conservative prediction of contaminant migration from the mine disposal area to the compliance boundaries. Based on the modeling results, Ecology concluded that the long-term monitoring frequencies in the DCAP were protective.

For more details, please refer to the BIOSCREEN report ("Bioscreen Modeling Results and Long-Term Groundwater Monitoring Frequency") by Golder dated October 13, 2008 and Ecology's January 21, 2009 decision letter on long term monitoring frequency (available at Ecology's northwest regional office Central Records and at Ecology's website for Landsburg Mine site at: <https://fortress.wa.gov/ecy/gsp/CleanupSiteDocuments.aspx?csid=60>).

While Ecology concludes that the results of the modeling are sound and justify the DCAP's long-term monitoring plan, we understand the public's concerns about the frequency of long-term monitoring. Therefore, to be more protective of human health and the environment, Ecology has updated the Final CAP to require that all analyte parameters will be monitored at a frequency of once every five years at the south sentinel and compliance wells, instead of once

every 10 years during long-term groundwater compliance monitoring. This increased frequency will also provide Ecology with a full suite of analysis for the five-year periodic review. Ecology will also require increased monitoring frequency whenever confirmed sample results at a sentinel well exceed ¼ of the cleanup level (see Table 4).

3. Jason Howell and the CRC questioned whether the design of the current and proposed monitoring well network and the requirements for sampling “types” and frequencies are sufficient to protect public health.

### **Ecology’s Response:**

Ecology concluded that the number and placement of monitoring wells is sufficient and effective at detecting potential contaminated groundwater at the Site for the following reasons:

- Site monitoring wells are located in the highly permeable mine workings beneath the subsidence trench. Permeability is much higher in the mine workings of the Rogers seam compared to the flow across the vertically dipping bedrock on the west and east sides of the seam.
- The five monitoring wells are located at the discharge points at the north and south portals.
- There is a deep well within the southern interior of the mine workings to detect any potential contaminant migration southward.
- There are also two wells, one to the west and one to the east of the trench that monitor lateral groundwater flow across bedrock bedding planes, which flank the Rogers seam trench where the wastes are located (see Figure 3).

Ecology also finds the proposed frequencies of monitoring to be effective in protecting human health and the environment. Please refer to Ecology’s responses in Sections J(1) and J(2).

The Compliance Monitoring Plan provides for long-term groundwater monitoring frequencies that will detect contaminants at sentinel wells within the Site boundaries before they exceed cleanup levels at the point of compliance.

Based on the 2016 health consultation, the Final CAP will situate the deeper sentinel well at the north end of the mine at a higher elevation to allow better overall vertical groundwater monitoring coverage. If logistically possible, the shallow and deeper sentinel wells will be moved within the inclined northern mine shaft location. However, if that is logistically impossible, they will be moved as close as possible. The changes in locations will be addressed in the CAP and engineering design report. The Final CAP has also been modified to require considering additional monitoring wells in the southern portion of the mine if the groundwater divide is found to be located beneath any portion of the former waste disposal area.

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## **K. Monitoring Well Installation for Cap Performance Monitoring**

The City of Kent suggested that two additional performance monitoring wells be installed within the capped area in order to gather sufficient data to evaluate the performance and effectiveness of the cap once installed.

The City also suggested that “the new monitoring wells be installed before the trenches are backfilled in order to gather baseline data.

### **Ecology’s Response:**

Additional wells beneath the proposed cap are not needed for several reasons. First, the installation of additional wells may disturb the wastes and cause the spread of contamination from the waste area. Second, drilling additional wells may create preferential pathways for rainwater infiltration and leaching through the wastes, defeating the purpose of the cap. Finally, while some additional data may be gained from such wells, they would not provide significant added benefits to the selected remedy, including the long-term monitoring program. See also Ecology response in Section F (“Installing a Well in the Center of the Wastes/Disposal Area”).

Ecology finds the proposed number and locations of the sentinel wells (north and south) to be adequate and appropriate. The “Dual South Sentinel/Cap Effectiveness Well” well is a combination well serving two functions: (1) a performance well for evaluating cap performance; and (2) a sentinel well for detection of potential contaminant migrating to the south. This combination well will be monitored in conjunction with existing wells LMW-1 and LMW-1A to establish baseline measurements for hydraulic performance of the cap. LMW-1/1A, located within the rock bridge, is situated at the northern half of the proposed cap.

The Final CAP will require the sentinel wells to be installed before construction of the cap. Please note that the short-term (construction phase) monitoring plan will still apply to the original wells as described in the CAP, but not the sentinel wells. However, water levels will be measured in the sentinel wells before and during construction. After the construction phase, the monitoring plan will apply to the sentinel wells in accordance with the long-term sampling program as described in the Compliance Monitoring Plan schedule (see Table A-2 in the Compliance Monitoring Plan).

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## **L. New Monitoring Well Design and Placement**

The City of Kent expressed concern about the locations of new groundwater monitoring wells north of the mine, stating that they will not be able to intercept groundwater flowing towards the Cedar River watershed.

### **Ecology’s Response:**

The proposed sentinel wells are appropriately located within the mine workings to intercept groundwater flowing northward and southward through the mine workings. Groundwater emanating from the former coal mine flows most rapidly through the mine workings where collapsed coal and gravel rubble and rock tunnels create a high transmissive flow path to the

north.

For the northward groundwater flow, two new sentinel wells (for early detection) will be screened in the upper portion of the water table in the mine workings/rubble and at the mid-level of the mine workings/rubble near Portal #2. If logistically possible, the shallow and deeper northern sentinel wells will be moved within the inclined northern mine shaft location. However, if that is logistically impossible, they will be moved as close as possible. Sentinel wells in these locations will be able to detect potential contamination emanating from the waste disposal trenches before it migrates to the compliance boundary, which will be monitored by LMW-2, LMW-4 and LMW-10 (which were all installed in the mine workings).

In its original comments provided to the City about well placement at the north end, the City's consultant Aspect Consulting suggested installing a well in the gravel trench at the north portal. The gravel trench is in the portion of the mine workings extending from the portal area to SE Summit Landsburg Road, which was filled-in to level off the ground after coal was extracted from the surface in this area. In response to Aspect Consulting's suggestion, Ecology verified that the proposed sentinel well locations are already in the mine workings and trench and thus are in the primary groundwater pathways from within the former mine.

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#### **M. Omission of 1,4-Dioxane from Analytical Suite**

The City of Kent suggested that because the former waste disposal area contains chlorinated solvent wastes, the chemical 1,4-dioxane should be added to the suite of analytes to be tested for under the groundwater monitoring program.

##### **Ecology's Response:**

Ecology has revised the CAP to add the analyte 1,4-dioxane to the list of analytes which will be analyzed using EPA Method 8270 when this method is required during compliance monitoring.

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#### **N. Notification in Event of Contaminant Detection**

The City of Kent commented that under the CAP, "interested parties" should be notified if and when groundwater monitoring detects contamination migrating from the former mine and that "all Site data" should be made available to the public on a website.

##### **Ecology's Response:**

Ecology's practice has been to notify the public, other agencies, and local governments such as the City of Kent about Site activities and status in a timely manner by email and outreach tools such as the Site Register, Ecology's website, Fact Sheets, and Display Ads. Ecology's data submittal policy (Policy 840) and Environmental Information Management System (EIM) requires posting of environmental data online. See also Section X of the Consent Decree.

These tools have always been available for data and information exchange.

Under WAC 173-340-130(7)(a), “If the department is conducting remedial actions or requiring remedial actions under an order or decree, the department shall ensure appropriate local, state, and federal agencies and tribal governments are kept informed and, as appropriate, involved in the development and implementation of remedial actions. The department may require a potentially liable person to undertake this responsibility.” Therefore, Ecology will require the PLP Group to also notify the City of Kent Public Works by email or phone if and when it is confirmed that contamination has been detected at the Site. Ecology will include this in Section 5.5.5.5 of the CAP (“Response if Remediation levels Are Exceeded”) and Section 1.7.2 of the Compliance Monitoring Plan (“Response If Remediation Levels Are Exceeded”).

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## **O. Recognition of Other Water Resources Surrounding Site**

The City of Kent commented that the Consent Decree failed to reference other nearby water resources, including the Cedar River, Rock Creek, and the Clark Springs facility.

### **Ecology’s Response:**

Ecology has added the following language to Section V of the Consent Decree:

“The Site is situated between two surface water bodies (river/streams): Rock Creek to the south and Cedar River to the north. An infiltration gallery adjacent to Rock Creek, referred to as the Clark Springs facility, has been used by the City of Kent since 1957 as a supplement to its municipal water sources. The infiltration gallery is located adjacent to Kent-Kangley Road and is located approximately 4,100 feet west-southwest of the Site’s south portal.”

In addition, Ecology has updated the CAP to include information about the City of Kent’s Clark Springs’ municipal drinking water system, the Covington Water District system, and the Cedar Valley Sole Source Aquifer (used by the City of Renton). This was done because of concerns about the local water systems and the Site’s potential effect on the water supply.

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## **P. Plan Approval and Ecology Assurance of Protection of Water Resources**

The City of Kent expressed concern that the selected remedy will undermine Ecology’s obligation to protect “irreplaceable water resources.”

### **Ecology’s Response:**

Despite the lack of data indicating impacts to groundwater or nearby water resources for almost 40 years since waste disposal took place, Ecology has taken a precautionary approach by

assuming that contaminants may migrate from the former waste disposal area in the future. By implementing the selected remedy, Ecology seeks to further ensure the safety of nearby water resources. Implementation of the FinalCAP will remediate the Site by:

- filling in the northern portion of the trench where the wastes are located
- capping it with a low permeability soil cap (Figure 3)
- applying institutional controls on land and groundwater use
- installing infrastructure for contingent groundwater capture and treatment should contamination be detected at Site wells, and
- monitoring groundwater until residual hazardous substance concentrations no longer exceed cleanup or remediation levels as described in the CAP resulting from either (1) the application of new remediation technologies currently unavailable or (2) other circumstances or conditions that affect residual concentrations such that they no longer pose a risk to human health or the environment.

This remedy is protective because it is designed to:

- contain and isolate the wastes from direct contact,
- prevent or reduce leaching of the wastes by rain and groundwater,
- reduce the amount of groundwater emanating from the mine,
- secure the site from activities that may interfere with the cleanup remedy,
- maintain long-term groundwater monitoring for timely detection of a possible contaminant release from the Site, and
- implement a contingency plan to prevent contaminants from leaving the Site, if detected, in a timely manner.

The selected remedy is protective of human health and the environment and provides assurance that nearby water resources, such as the Cedar River and Rock Creek, are safeguarded from a potential release from the Site.

Presently, the waste disposal area is still a fenced-off open trench. The waste remains vulnerable to leaching by rainfall and there is potential direct contact exposure if someone climbs over the fence and potential exposure to wildlife that enters the trench. Ecology concludes that the proposed cleanup remedy will improve the current situation by eliminating or reducing the risk of direct exposure and leaching of precipitation.

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## **Q. State of Washington's Duty to Protect Water Resources and Public Health**

The City of Kent commented that implementation of the selected remedy would be inconsistent with the State's authority and duty to prevent harm to water resources, public health, and local economies.

### **Ecology's Response:**

Ecology has been and continues to follow its mandate to implement environmental cleanup to protect human health and the environment in accordance with MTCA. For the past 20 years, Site investigations and groundwater monitoring have demonstrated that there have been no impacts to groundwater emanating from the mine. Ecology chose the selected remedy in order to safeguard area water resources and to protect human health and the environment should a release occur in the future.

Ecology designed the CAP to protect water resources – please refer to Ecology’s response in Section P (“Plan Approval and Ecology Assurance of Protection of Water Resources”).

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## **R. Concerns about Financial Assurance**

(Greater Maple Valley Unincorporated Area Council, Cedar River Council, City of Kent)

Many commenters voiced concerns about the funds and funding arrangements for maintaining the remedial action, specifically for long-term groundwater monitoring, contingency actions, and soil cap maintenance. There was a concern that the money would be used up, and that all of the PLPs funding the cleanup would either declare bankruptcy or drop out of their obligations to fund the cleanup.

Specifically, the Greater Maple Valley Unincorporated Area Council (GMVUAC) suggested that the Consent Decree require PLPs to contribute additional financial assurances over time in order to safeguard against the possibility of PLPs escaping liability without ensuring the long-term effectiveness of the cleanup.

### **Ecology’s Response:**

The PLPs are required to pay for the cleanup, all on-going operation and maintenance costs, and implementation of the contingency plan, if required. Once the Consent Decree is finalized and filed in King County Superior Court, each PLP within the PLP Group will be jointly and severally liable for the full cost of cleanup as well as all operation and maintenance costs. This means that if one PLP becomes insolvent (goes bankrupt), then the remaining PLPs are still liable for funding the full cost of cleanup, all operation and maintenance costs, and any future required implementation of the contingency plan.

WAC 173-340-440(11) regarding financial assurance, states:

(11) Financial assurances. The department shall, as appropriate, require financial assurance mechanisms at sites where the cleanup action selected includes engineered and/or institutional controls. It is presumed that financial assurance mechanisms will be required unless the PLP can demonstrate that sufficient financial resources are available and in place to provide for the long-term effectiveness of engineered and institutional controls adopted. Financial assurances shall be of sufficient amount to cover all costs associated with the operation and maintenance of the cleanup action, including institutional controls, compliance monitoring, and corrective measures.

Pursuant to WAC 173-340-440(11), financial assurance is required for activities involved in the long-term operation and maintenance of the cleanup action, including institutional controls, compliance monitoring, and corrective measures. There are a number of different forms that financial assurance can take. The PLP Group could choose any of the following to prove financial capacity: a trust fund, letter of credit, third party liability insurance, financial test, corporate guarantee, payment bond, or performance bond. The Consent Decree does not require a specific type of financial assurance. That decision is left up to the PLP Group; however, the amount of money (or the amount of financial assurance coverage) must be reviewed and approved by Ecology within 60 days of the effective date of the Consent Decree.

Section XXI of the Consent Decree states that Ecology has approved the initial financial assurance estimate of \$775,000. The financial assurance vehicle for the Landsburg Mine Site is likely going to be a trust fund; however, the PLP Group may select another form of financial assurance before the deadline to provide proof of financial assurances sufficient to cover the initial estimate of \$775,000 (within 60 days of the effective date of the Consent Decree).

Ecology has extensive experience managing financial assurances for both MTCA sites and for dangerous waste facilities regulated under RCW 70.105. Based on the analysis of the cost estimates and anticipated financial assurance mechanisms by Ecology's Toxics Cleanup Program and Ecology's Hazardous Waste & Toxics Reduction Financial Assurances Office, the amounts estimated are sufficient for the operation and maintenance of the cleanup action and protects public welfare in the process.

In addition, there are certain protections built into the financial assurance section of the Consent Decree. First, the Consent Decree requires an annual review, which obligates the PLP Group to provide documentation to Ecology regarding the status and account balance of the financial assurance in place to fund the long-term O&M of the cleanup action, including groundwater monitoring. Second, Ecology may require additional money to supplement the financial assurances if it becomes necessary (i.e. if the annual review identifies that there are insufficient funds, or if the costs of the O&M are higher than anticipated). In the event that the Groundwater Contingency Plan is implemented, Ecology would require additional financial assurance for the ongoing operation and maintenance of the groundwater treatment system.

Ecology's yearly review of the financial assurance mechanism for the Landsburg Mine Site will ensure that there are sufficient funds to carry out the ongoing operation and maintenance and monitoring until Ecology determines that it is no longer required.

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## **S. "In Perpetuity" vs. "Indefinitely"**

(GMVUAC, City of Kent)

Several commenters expressed concern that the use of the word "indefinitely" is not the same as "in perpetuity," which was the terminology used by Ecology in previous outreach events and communications.



The City of Kent requested that the text be revised to indicate that soil cap maintenance will be required “in perpetuity.”

GMVUAC commented that the courts have interpreted “*indefinite*” to mean “*temporary*,” thereby causing them concern that there are not enough protections in the financial assurance mechanisms for the long-term nature of this cleanup.

### **Ecology’s Response:**

“In perpetuity” generally means “eternal” or “forever,” while “indefinitely” means for an undesignated amount of time. GMVUAC is partially correct that the word “indefinitely” does not necessarily mean “permanently.” The long-term groundwater monitoring at the Landsburg Mine Site will continue indefinitely in that it will only stop if and when Ecology grants its approval.

With respect to GMVUAC’s concern that the courts have interpreted “*indefinite*” to mean “*temporary*” [*U.S. v. Pieter van den Berg*, 5 F.3d 439 (9th Cir. 1993)], Ecology respectfully disagrees with the application of that case to this situation. The Ninth circuit in *U.S. v. Pieter* was discussing the meaning of a “temporary statute”—a legal term of art used in the context of analyzing the retroactive application of penalties under a repealed or expired statute. One party argued that the statute at issue was “indefinite” rather than “temporary” because its expiration was conditioned upon a certain event occurring rather than a certain end date. The court reasoned that “indefinite” is more like “temporary” than it is “permanent” since there is a presumed end date, although that end date may be unknown. The court concluded that, “to the extent that such labels are useful,” an “indefinite” statute is a subset of a “temporary” one.

Ecology understands the public’s concerns about the use of the terms “in perpetuity” versus “indefinitely.” Ecology used the term “in perpetuity” early on in describing the proposed cleanup actions at the Site, including the long-term groundwater monitoring plan. During preparation of the DCAP, the term “indefinitely” was substituted for “in perpetuity” because Ecology wants to keep open the possibility that in the future, a technology might exist that would more permanently remediate the wastes contained within the Site. Ecology did not intend to change the overall meaning or intent of the long-term nature of the cleanup action plan, which includes monitoring and containment.

For the cleanup, Ecology believes that the terms “indefinitely” and “in perpetuity” are operationally equivalent. Ecology interprets these words to mean continuous monitoring with no timetable to terminate the long-term requirements. As long as the wastes remain at the Site (to be buried under clean fill and a soil cap), the cleanup remedy and its measures (groundwater monitoring, institutional controls, contingency plans) will continue to be carried out indefinitely (“in perpetuity”) until such time as Ecology determines otherwise.

Ecology has revised the CAP to clearly define the term “indefinitely” for purposes of the cleanup. The following sentence will be inserted as the last paragraph of section 1.3 of the CAP (“The CAP and the Cleanup Process”):

“For this cleanup action plan and other exhibits to the Consent Decree, the use of the word ‘indefinitely’ will mean with no timetable to terminate the long-term requirements of cleanup, and continuously until such time Ecology says otherwise (i.e. approval of a new remedial technology that permanently remediates the wastes to below MTCA cleanup levels and/or existence of other conditions that affect concentrations such that they no longer pose a risk, present or future, to human health and the environment).”

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## **T. Provisions for Termination of O&M and Institutional Controls**

(Jason Howell, City of Kent)

### 1. Jason Howell commented on

- Section 5.5.5.3 of the DCAP (Confirmational Monitoring), which states:

“Long-term confirmational groundwater monitoring and Site inspections and maintenance will continue until residual hazardous substance concentrations no longer exceed cleanup or remediation levels as described in the CAP resulting from either (1) the application of new remediation technologies currently unavailable or (2) other circumstances or conditions that affect residual concentrations such that they no longer pose risk to human health or environment.”

Jason Howell commented that this language could be exploited as an “escape clause” that the PLP Group could use to circumvent long-term monitoring and notification requirements.

### **Ecology’s Response:**

The Consent Decree, including the CAP, does not provide for termination of the remedy or any remedy components unless and until Ecology determines that hazardous substances are no longer present at the Site above MTCA cleanup levels. This would have to result from either (1) the application of new remediation technologies currently unavailable or (2) other circumstances or conditions that affect residual concentrations such that they no longer pose a risk to human health or the environment.

The language the commenter cites addresses the possibility that in the future, a new technology might exist that would more permanently remediate the wastes at the Site, achieve MTCA cleanup standards and requirements, and eliminate attendant risks (including potential future releases). The quoted language still ensures that the cleanup remedy (including confirmational monitoring) will continue indefinitely, or until the wastes can be remediated permanently at or below MTCA cleanup standards. Consequently, the PLP Group would have to demonstrate to Ecology that the Site no longer poses a threat to human health and the environment, based on evidence that the Site had been fully remediated in accordance with MTCA requirements, including elimination of potential future risks as identified in the RI/FS report and the CAP. In such a case, Ecology may determine that there is no need to continue implementing the original cleanup plan (containment remedy) as described in the Consent Decree; however, the process for

public involvement, compliance monitoring for the more permanent remedy, and delisting of the Site will still apply.

Operationally, as long as the wastes are at the Site (to be buried under approximately 20 to 70 feet of clean fill and a soil cap), the cleanup remedy and its measures (groundwater monitoring, institutional controls, contingency plans) will continue to be carried out indefinitely. Any significant change of such activities would require an amendment to the Consent Decree, which would not occur without public notice, an opportunity for comment, and Ecology's approval.

Please also see Ecology's response in Section S ("In Perpetuity" vs. "Indefinitely").

2. The City of Kent expressed concern that the CAP does not require groundwater monitoring to continue "in perpetuity." The City commented that the CAP contains provisions that contemplate future termination of long-term monitoring, O&M requirements, and institutional controls.

### **Ecology's Response:**

Ecology is not abandoning its conservative approach to remedy selection. The original approach, including the conceptual elements of the remedy chosen in the 1996 RI/FS report, is still the same conservative approach and remedy in the Final CAP.

"In perpetuity" monitoring has not been abandoned in the Final CAP; the term was merely changed to "indefinitely" to allow for the future possibility that a technology may exist to permanently remediate the Site, which would be more protective of human health and the environment. O&M activities and institutional controls will continue indefinitely, unless and until Ecology determines otherwise—which would trigger an additional public comment period.

See also Ecology's response in section S ("In Perpetuity" vs. "Indefinitely").

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## **U. Regulatory Compliance and Alleged Violations**

The City of Kent wrote that it believes the CAP fails to comply with MTCA requirements and that "Ecology's conduct has been arbitrary, capricious, and unlawful," in violation of Washington's Administrative Procedure Action (APA). In particular, the City of Kent commented that Ecology made "misrepresentations to the public" and "arbitrarily and capriciously abandoned the 'Black Box Approach' relied upon for the past 20 years of Site decisions and activities." The City also wrote that the selected remedy is based upon "speculation and unproven assumptions" and "fails to comply with MTCA's requirements to provide a reasonable assurance of protectiveness of human health and the environment."

### **Ecology's Response:**

Ecology believes that both the DCAP and the Final CAP fully comply with MTCA- and that the agency's actions have been neither arbitrary and capricious nor unlawful.

The DCAP went out for public comment as required under WAC 173-340-600. Ecology has been diligent in its outreach and public communication activities (see section IV, "Summary of Public Involvement"). Ecology has kept the City of Kent Public Works informed of Site activities and has provided them with copies of interim groundwater monitoring in a timely manner.

In accordance with MTCA, the Site underwent the following activities or milestones:

- Initial Investigation completed in 1989
- Site Hazard Assessment completed in 1991
- Added to the Hazardous Sites List in 1991
- Agreed Order for RI/FS executed in 1993
- RI/FS completed in 1996. The RI/FS report included a determination of cleanup standards including ARARS and a disproportional cost analysis
- Twenty years of groundwater monitoring at the Site
- Interim actions in 1990 and 2008
- Publication of the draft Consent Decree, including the DCAP, for public comment in 2013
- Health consultation with DOH completed in 2016

The investigative and cleanup approach taken in the 1996 RI/FS was to monitor the outputs to the groundwater flow system in the former mine and assume as a precaution that the wastes or their leachates could migrate out in the future. The preferred remedial alternative from the 1996 FS is the same approach as that taken in the DCAP, although Ecology has now incorporated additional precautionary safeguards based on additional data and a better understanding of the risks. Accumulated data, such as results from deep well LMW-11, have provided additional confirmation of the absence of deep groundwater contamination and therefore confirmed the reduced degree of risk to the south where the Rock Creek watershed and the Clark Springs Water Supply are located.

The Final CAP has been refined to the point that it is highly protective and precautionary in nature. It still involves the assumption that the wastes in the northern trench may impact groundwater within the former mine and possibly migrate out in the future. The CAP proposes to cover the waste area with clean fill and a low permeability cap. The CAP requires indefinite monitoring at the discharge points (or outputs) of the former mine and a portion of the interior. The discharge points are located at the former mine portals to the north and south and are the primary pathways for groundwater to flow at the Site. The CAP also requires the PLP Group to implement a Contingent Groundwater Extraction and Treatment Plan with treatment infrastructure and institutional controls on groundwater use, Site access, and cap maintenance. There is also no evidence of a danger to state water resources. Even if this were to change, the PLP Group would be required to implement the contingency plan, which will be triggered if the sentinel wells indicate contamination at one-half of the cleanup level.

While Ecology believes that the work done at the Site has been diligent, protective of human health and the environment, responsive, and transparent to the public and local government in accordance with MTCA and APA, additional site characterization work, as recommended by DOH, will be done to confirm those findings. See Ecology's response in Section E ("Site Characterization and Investigation").

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## **V. Alleged False/Misleading Statements in the Fact Sheet**

1. The City of Kent commented that the following statements about the RI/FS contained in Ecology's October 2013 Fact Sheet were false or misleading:
  - a. "The RI/FS investigated the nature and extent of contamination...at the Site."
  - b. The RI/FS report presented "results of investigations into...the nature and extent of contamination."
  - c. The RI/FS "consisted of a comprehensive investigation of site environmental conditions."

### **Ecology's Response:**

Ecology does not believe that the Fact Sheet was false or misleading. An RI/FS was conducted at the Site and the remedial decisions were based on adequate information.

Fact sheets are a high-level summary of available information, and do not contain complete technical detail regarding the Site and the DCAP. The Fact Sheet is meant to give the public an overview of the Site, including the history of the Site, the contaminants of concern, and the proposed remedial action. During the public comment period, the public then has an opportunity to review the complete record and provide its comments to Ecology.

Please also see Ecology's response in Section E ("Site Characterization and Investigation").

2. The City of Kent commented that the following statement about soil sampling contained in the Fact Sheet was false: "[S]oil sampling conducted in...the northern areas of the trench showed no contamination." The City further commented that, "to the contrary, no soil sampling ever occurred in the trench (anywhere)."

### **Ecology's Response:**

The October 2013 fact sheet erroneously stated that soil sampling conducted in the northern areas of the trench showed no contamination; however, in the same sentence, it correctly stated that soil sampling conducted outside of this area and at the portal areas showed no contamination. Furthermore, the City's comment that "no soil sampling ever occurred in the trench (anywhere)" is not correct.

Section 3.2.21 of the 1996 RI/FS report describes soil sampling conducted within the trench. The 1991 Site Hazard Assessment (SHA) included the collection of 14 surface and subsurface soil samples from within the northern trench area, surface water samples from two ponds, and

liquids sampled from three exposed drums. Figure 3-4 in the RI/FS report shows the locations of those samples. Soil chemical data from the SHA were incorporated into the overall data evaluation in the 1996 RI/FS.

In addition, in 1991, the PLP Group removed accessible drums from the trenches north and south of the rock bridge in the northern area of the Site where disposal occurred. As part of this removal action, the PLP Group inspected and tested the residual materials in the drums and conducted some additional sampling and analyses of sludges observed in the trench soils. The results (Site Hazard Assessment by Ecology and Environment, 1991; and Emergency Drum Removal by Burlington Environmental, 1991) were reported and are located in Ecology's Central Records.

3. The City of Kent commented that the following statement about the local water supply contained in the Fact Sheet was false: "There is no known threat to the Clark Springs water supply from the Site based on over 20 years of investigations and monitoring." The City also commented that this statement evidences abandonment of Ecology's conservative approach to the cleanup.

### **Ecology's Response:**

The Fact Sheet correctly states that there is no known (or actual) threat to Clark Springs, such as a contaminated groundwater plume, because no groundwater contamination has been detected leaving the Site. Furthermore, results from monitoring at the southern deep interior of the former mine indicate a reduced future risk to the City of Kent's water supply.

There are no wastes in the southern subsidence trench area above the former mine. However, contaminated water inside the southern half of the former mine (if it existed) could potentially flow towards the south portal and into Rock Creek and downstream to the area of Clark Springs. To date, the deep (700 foot) well and other wells in the southern portion of the former mine have shown no contamination. The wastes are located at the northern area of the subsidence trench, and the groundwater within the mine beneath the waste area flows to the north portal. The flow directions in relationship to the location of the wastes, and the lack of any groundwater contaminant detections in the southern half of the Site is indicative of a lesser risk compared to the risk of future contaminant migration from the north portal (Cedar River and areas around the north portal).

The CAP has not abandoned Ecology's initial assumptions about the presence of wastes and its precautionary approach to the cleanup plan for the Site. Furthermore, the CAP still incorporates long-term monitoring and contingency plans at the south portal and in fact improves upon previous versions of the DCAP. Improvements include (1) infrastructure for a contingent treatment system at the south portal, (2) institutional controls at the south as well as the north portal areas, and (3) more groundwater monitoring wells. Another improvement is designing the cap to cover the former waste disposal area at the northern half while leaving the southern portion of the subsidence trench open. This allows precipitation to enter into the southern half of the former mine and thus maintain the groundwater divide near the south portal. Thus, water

flowing out to Rock Creek from the former mine will not be derived from water beneath the waste area to the north half of the former mine.

These improvements are enhancements of the original preferred Site remedy proposed in the 1996 RI/FS report.

4. The City of Kent commented that the Fact Sheet contained misleading information about the CAP's groundwater monitoring plan because the Fact Sheet did not set forth the details of how the frequency of sampling events will change over time during the long-term monitoring phase. The City commented that these details were "buried" in complex and confusing documents.

**Ecology's Response:**

The passage in question (page 10 of the Fact Sheet) reads:

Q: How often are the monitoring wells at the Site tested?

A: Presently, the wells are being sampled twice a year - in the spring (typically high groundwater levels) and fall (typically low groundwater levels).

This specific question-and-answer was only intended to address the current monitoring frequency. It was not intended to describe the entire proposed monitoring plan. The monitoring frequency in the DCAP provides for short-term to long-term durations (see Tables 3 and 4 of this document). This information was available to the public in the DCAP at the document repositories and website during the comment period, and Ecology presented the proposed monitoring program and frequency to the public during its public meeting.

Moreover, in response to the public's concerns about the frequency of sampling events during long-term monitoring, Ecology has updated the Final CAP to increase the frequency of testing for all analyte parameters at the south sentinel and compliance wells. Ecology will also require increased monitoring frequency whenever confirmed sample results at a sentinel well exceed ¼ of the cleanup level. See Ecology's response to Section J ("Protectiveness of Long-Term Monitoring Frequency").

5. The City of Kent added in their above comment that the proposed monitoring requirements have no seasonal basis."

**Ecology's Response:**

The proposed long-term monitoring program in the CAP is based on sampling over seasonal variations or at seasonal lows, where any potential contamination would be less diluted and present at the highest potential concentrations. The proposed monitoring plan, depending on time following remedy construction, is designed to account for seasonal variations in groundwater level. Please refer to Table A-2 in the Compliance Monitoring Plan for the detailed program.

6. The City of Kent commented that the Fact Sheet was misleading because it stated that the CAP requires “Applying institutional controls on land and groundwater use” and “Monitoring groundwater indefinitely” and because it did not describe the CAP’s “termination provisions for monitoring, maintenance, and institutional controls.”

**Ecology’s Response:**

The Fact Sheet appropriately describes the terms and duration of the institutional controls, groundwater monitoring, and other long-term components of the DCAP. Fact sheets are a high-level summary of available information, and do not contain complete technical detail regarding the Site and the DCAP. The Fact Sheet is meant to give the public an overview of the Site, including the history of the Site, the contaminants of concern and the proposed remedial action.

Also, please see Ecology’s response in Section I (“Provisions for Termination of O&M and Institutional Controls”) with regard to the comments on alleged termination provisions.

The City of Kent commented that the Fact Sheet contained a number of speculative statements, including assumptions about “Hazardous Waste Dumping Locations,” “the ‘Unlikely’ Detection of Contaminated Groundwater,” “Why Groundwater Contamination Has Not Been Detected (Yet) At The Site,”

“Trench Voids, Instability, and Safety,” and “fires consuming wastes.”

**Ecology’s Response:**

Ecology’s response in Section E (“Site Characterization and Investigation”) describes the investigations and data used to determine the location of the wastes in the trench and to choose the preferred cleanup alternative. The 1996 RI/FS report established the existence and location of the waste area. Since the late 1970s when the disposals occurred, groundwater emanating from the mine has not been affected by contamination coming from the wastes, nor was there any evidence of any impacts shortly after the disposals. The proposed cleanup plan still conservatively assumes that contamination to groundwater coming out of the former mine may occur in the future.

Ecology does not find the language that explains the possible reasons why groundwater contamination has not been detected at the Site to be misleading. The Fact Sheet (as well as other documents discussing groundwater contamination) clearly states that these are possible explanations and were based on information gathered during the RI/FS, including information from records collected on the disposals and documented history where available. The 1996 Remedial Investigation presented the following reasons:



- 1) Wastes disposed in the trench are no longer present, either because they were consumed in the fires that were known to have occurred, or they already discharged to Cedar River through the mined-out Rogers Seam.
- 2) The chemicals from the wastes were absorbed in place by the leftover coal in the abandoned mine, effectively immobilizing them.
- 3) Some of the drums were either empty when disposed of or filled with relatively non-reactive or harmless substances. Much of the 200,000 gallons of oily wastewater would have had very low concentrations of chemicals, based on the description from invoice records.
- 4) Wastes are still contained within intact drums and have not yet been released.

Ecology's Fact Sheet does contain a statement regarding fires consuming wastes. Ecology concurs with the original RI/FS conclusion that fires may have burned off a portion of the wastes, but at the same time recognizes that the amount that may have burned off is unknown. This does not constitute reliance on speculation to justify the CAP; it simply states one theory that "A portion of the waste may have been burned during fires in the early 1970s."

In a January 2012 draft version of the Fact Sheet, the sentence read: "a *significant* portion of the waste may have been burned during fires in the early 1970s." However, in its editorial comments on the draft document, Ecology struck out the word "significant," since Ecology could find no investigation or data to support the contention that a "significant" portion of the waste had been burned off (see draft CAP January 16, 2012 version cited on page 787 of the City's comment document).

In response to the comment alleging "Speculation About Trench Voids, Instability, and Safety," the "Landsburg Mine – Coal Mine Hazard Assessment" (SubTerra, 2005) evaluated potential remaining mine voids and potential continued subsidence. Collapse of rubble from bedrock sidewalls and leftover coal occurred after coal extraction. The material left behind would not be as compacted as the original intact coal seam and would have void spaces between pieces of rock. Evidence of voids is found in the well logs in the RI/FS report and in mine records. Based on this information, Ecology believes that there are real potential hazards (such as bottom and sidewall collapse from voids or rubble displacement) in and around the trench that should be taken into consideration when developing the remedial action for the Site.

Please also see Ecology's response in Section G ("Covering Wastes (Containment Remedy)") for the technical and regulatory basis for capping the wastes after considering other cleanup alternative such as removal of the wastes.

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## **W. Ability to Submit Supplemental Comments**

The City of Kent commented that it intended to reserve the right to supplement" its comments upon discovery of additional information to be produced by Ecology.

### **Ecology's Response:**

The comment period for the cleanup Consent Decree for the Site is closed.

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## **X. Factors such as Earthquakes that Potentially Cause Contaminant Movement**

(Jason Howell, Cedar River Council, City of Kent)

1. Jason Howell, the CRC, and the City of Kent expressed concern about the selected remedy's ability to protect human health and the environment in the event of "a catastrophic event" such as an earthquake.

The CRC and the City of Kent suggested that the CAP include an additional contingency plan for events such as earthquakes, cavern collapse within the former mine, and major changes in groundwater levels and/or precipitation.

The City noted that a fault line "runs right through the Site" and that "a strong seismic event" could cause contamination to migrate away from the former waste disposal area. The City suggested that an emergency contingency plan require initiation of groundwater monitoring "within two (2) weeks, and monthly for one (1) year after" the event. The City also suggested that the Final CAP include an express provision describing Ecology's authority and discretion to require additional remedial action in the event of an emergency or "any appropriate circumstances."

### **Ecology's Response:**

The 1996 RI/FS report recognized that the wastes may impact groundwater in the future, which is why the CAP takes a precautionary approach, minimizes the potential for leaching of the wastes, maintains a protective groundwater monitoring program, and establishes infrastructure and contingency plans to contain and treat contaminated groundwater if it were to be detected at the Site. It was recognized that a natural event, such as an earthquake, may cause possible collapse or rupture of buried drums or drum remnants, thereby potentially releasing liquid contaminants into the mine workings. Potentially contaminated groundwater could subsequently migrate from the Site. Thus, it becomes important to monitor groundwater after such an event. Also, an earthquake could damage Site wells and the integrity of the soil cap.

To address the potential risk from earthquakes, the CAP calls for inspection of the Site after an intensity IV or greater earthquake (see page 38 of the CAP and page B-4 in the Operation and Maintenance Plan). Section 5.5.5.3 of the DCAP states, in pertinent part:

In the event of an earthquake of Intensity IV or greater (Modified Mercalli Intensity Scale) in the area, the cap will be inspected for damage and repaired accordingly. The north and south portal areas will be inspected for ground ruptures, fractures, earth displacements, or similar damage to original (pre-earthquake) landscape. If portal water surfaces due to the earthquake event, it will be inspected for signs of anomalous water quality (color, turbidity, odor, etc.). Ecology will be notified of site conditions within seven (7) days and a decision will be made between the property owner and Ecology on taking groundwater samples from site wells in accordance with the sampling network,

protocols, and analytical methods of the Compliance Monitoring Plan in the Consent Decree (Exhibit D).

In order to arrive at the decision to sample Site monitoring wells, the wells will have to be inspected for damage as part of the post-earthquake Site inspection. The timeliness of monitoring of the wells will be based on the results of the inspection report. If warranted by the extent of earthquake effects, Ecology may require that additional investigations be conducted to assess changes to the Site caused by the earthquake.

“Groundwater flow” is a risk exposure pathway recognized in the 1996 RI/FS report wherein contaminated water could potentially migrate out of the former mine and degrade drinking water resources surrounding the Site. All of the data gathered to date indicates that the groundwater emanating from the mine is not contaminated. However, if contaminated groundwater is detected at the site (for whatever cause), the contingency plan in the CAP is designed to prevent contamination from migrating from the Site by pumping the water, treating it, and disposing of it safely. See the Groundwater Contingency Plan for more details.

Fractures and faults do exist at the Site; however, the RI/FS report referenced mine records documenting that fractures and faults did not transmit significant amounts of groundwater. Furthermore, if fractures do exist that run across the Rogers seam, the two monitoring wells that are installed within the Frasier and Landsburg coal seams on either side of the Site (LMW-6 and LMW-7) would detect cross bedding flow or preferential pathway (fracture) flow of contaminants if it were to occur.

With regard to Ecology’s power and discretion to require more work in light of a new development or emergency event that affects cleanup, please also see the reopener provisions in Section XVIII.B of the Consent Decree (“Covenant Not to Sue—Reopeners”).

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## **Y. Concerns on Contingency Plan**

(Greater Maple Valley Unincorporated Area Council, Cedar River Council, City of Kent)

1. GMVUAC expressed concern about the volume of drums and waste that remain at the Site and the potential for off-Site migration of contamination.

In particular, GMVUAC commented that the CAP’s reliance on “industry-standard methods” to remediate contaminated groundwater in the event of detection at a sentinel well is insufficient to protect public health and safety.

### **Ecology’s Response:**

The concern expressed by GMVUAC appears to be directed at the second stage of the contingency plan, which is to treat the groundwater and dispose of it safely and reliably. First, if contingency actions are triggered, groundwater will be pumped to prevent contaminated groundwater from leaving the Site in order to protect human health and the environment. This water, whether it requires pretreatment or not, will not be released into the surrounding

environment. The CAP requires the PLP Group to dispose of this water safely into the sanitary sewer system, at which point it will be treated by METRO.

Secondly, as stated in the Groundwater Contingency Plan, because the groundwater emanating from the mine is not yet contaminated, Ecology does not know the specific mine waste contaminants that will be encountered. The treatment processes in the Contingency Plan cannot be identified until we know what the contaminants are. Using industry-standards and methods of treating the water as part of the overall response provides high levels of quality control, and target standards will ensure that treatment and disposal is protective of human health and the environment. Using non-industry standards for treatment could put the safety of the disposal of the water at risk. Once contamination is detected and remediation actions are triggered, the PLP Group must submit to Ecology for review and approval a design of the Contingent Groundwater Extraction and Treatment System along with a system-specific Operation and Maintenance (O&M) Plan. The groundwater treatment system design and O&M Plan will be prepared and submitted to Ecology in a timely manner after confirmation of the remediation level exceedance. See Table 5 below for details.

Furthermore, when the treatment system is connected to the publicly-owned treatment works (POTW) sewer, groundwater will be pumped to prevent any spread of contamination from the Site, and the treated water will be conveyed directly to the sewer system for secondary treatment and will not pose a threat to public health and safety.

If the infrastructure cannot be installed despite the county's written approval to connect to the sewer system (see Appendix A of the Groundwater Contingency Plan), other options will be available that insure that extracted, treated groundwater will not be released into the environment (for example, storing in Baker tanks, trucking water into sewer, or recirculation into trench). Accordingly, Ecology believes the proposed plan for water disposal is the most protective option available and does not rely solely on treatment methods to clean up potentially contaminated groundwater if detected at the Site. Please also see Section T ("Provisions for Termination of O&M and Institutional Controls") with regard to indefinite monitoring.

2. GMVUAC expressed concern about the Contingent Groundwater Extraction and Treatment System's ability to capture all contamination migrating from the mine. In particular, GMVUAC commented that contamination could "escape the seam" and impact nearby water resources, including private wells, the Cedar River, and Rock Creek.

### **Ecology's Response:**

The RI/FS report and CAP do not assume that all contamination will always be contained at the Site. The RI/FS report concluded that groundwater from the former mine chiefly flows out of the portal areas and through recessional glacial deposits that discharge into Cedar River and Rock Creek. Therefore, the water does flow into Cedar River and Rock Creek. This water has remained free of contaminants that could be attributed to the wastes. The approach at the Site has been such that if a release does occur in the future, then contingencies will be implemented. That is why the cleanup plan was written with its proposed remedial actions: trench infilling, covering with low permeability soil cap, surface water diversion, contingent groundwater

extraction and treatment infrastructure and plan, and long-term (indefinite) groundwater monitoring of sentinel and compliance monitoring wells.

3. GMVUAC expressed concern about “the lack of specific plans” to implement in the event of a “major leakage of contaminants” from the former mine.

**Ecology’s Response:**

Should groundwater monitoring indicate that groundwater is contaminated, there are specific requirements that must be met by the PLP Group for finalizing the design, implementing, and installing a groundwater extraction and treatment system. See Section 5.5.5.5 of the CAP, the Compliance Monitoring Plan, and the Groundwater Contingency Plan. Please also refer to Ecology’s other responses in this section.

4. The CRC commented that the Final CAP should include “conceptual level contingency plans” that set forth “general treatment systems for classes of contaminants.” The CRC questioned whether the PLP Group will be able to coordinate and take action fast enough in the event of a contaminant release. The CRC noted that it has been 17 years since the RI/FS was completed in 1996.

**Ecology’s Response:**

Ecology believes the level of detail in the Groundwater Contingency Plan is sufficient under MTCA. However, in response to public comments, Ecology is accelerating the time period for design, review, and permitting of the contingent groundwater treatment system. Ecology has made changes to the Final CAP in response to these concerns. Please see Section Y(5) and Table 5 below.

5. The City of Kent expressed concern that the Groundwater Contingency Plan does not require “immediate” installation and operation in the event of off-Site contaminant migration.  
The City suggested that the “trigger” level of contamination should be set more conservatively.

**Ecology’s Response:**

The Groundwater Contingency Plan is designed to capture a potential contaminant plume by pumping or extracting groundwater (also referred to as groundwater containment) in order to treat and safely dispose of the water before contamination exceeding cleanup levels migrates from the Site.

In 2009, the infrastructure components of the Contingent Groundwater Extraction and Treatment System' that could delay construction were identified, designed, and constructed as an Interim Remedial Action to shorten the time needed to implement the entire extraction and treatment system.

Although Ecology believes that the design, installation, and operation of the Contingent Groundwater Extraction and Treatment System can be carried out in an appropriate and timely manner to prevent off-Site migration, Ecology has made changes to the Final CAP in response to public comments. Specifically, Ecology is accelerating the schedule for triggering implementation of the Contingent Groundwater Extraction and Treatment System as follows:

- Ecology review and approval, and permitting of the Contingent Groundwater Extraction and Treatment system, will be initiated if and when collected samples detect and confirm that the groundwater contaminant concentration is at or above one-half of the MTCA cleanup level<sup>2</sup> at designated sentinel wells (Portal #2 sentinel wells, LMW-11, LMW-9, and the proposed sentinel well adjacent to LMW-11).
- The final design submittal will be due within 30 days of a confirmed exceedance as described above.
- Installation of the Contingent Groundwater Extraction and Treatment System will begin if and when the confirmed groundwater contaminant concentrations reach MTCA cleanup levels at the above designated sentinel wells.
- The system will be turned on and operated if and when the groundwater is confirmed to be contaminated and concentrations meet or exceed one-half of the MTCA cleanup levels at a compliance well.
- The system will continue to be operated until concentrations at the compliance wells and in the pumped effluent remain below one-half of the MTCA cleanup levels for four consecutive monitoring periods or a minimum of one year.

These revised requirements in the Final CAP enable implementation of the Groundwater Contingency Plan in a more timely manner, with added protection to the public health and the environment.

In addition, if a sentinel well detects contamination at 1/4 of MTCA cleanup levels, Ecology will require more frequent Site monitoring to ensure prompt operation of the extraction and treatment system (where the trigger for operating the system is 1/2 MTCA cleanup level at the compliance wells).

As a precaution, Ecology will require the installation of additional performance wells between the contingent extraction wells and the compliance wells for determining containment of the contaminant plume during groundwater extraction when the system becomes operational. The compliance wells will be used to confirm that contaminated groundwater does not migrate off-Site.

The following table summarizes the original and revised set of triggers.

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<sup>2</sup> Cleanup level means the concentration of a hazardous substance in soil, water, air, or sediment that is determined to be protective of human health and the environment under specified exposure conditions.

**Table 5. Revised Contingency Plan Triggers**

Contingency Plan Phase of Work	Triggering Event				Estimated completion time <sup>[2]</sup>
	July 2013 DCAP		Final CAP		
	Sentinel well <sup>[1]</sup>	Compliance well	Sentinel well <sup>[1]</sup>	Compliance well	
<i>Increased frequency of groundwater monitoring</i>		1/4 cleanup levels	1/4 cleanup levels		
<i>Design, Ecology approvals, and permitting requirements</i>		1/2 cleanup levels	1/2 cleanup levels		Design submittal: Within 30 days
					Approvals and permitting: 2 – 4 weeks
<i>System installation</i>		1/2 cleanup levels	Reaches cleanup levels		2 – 4 weeks
<i>System startup, optimization, and operation (including pumping)</i>		Reaches cleanup levels		1/2 cleanup levels	2 weeks
<i>System shutdown</i>		Compliance well and pumped effluent below cleanup levels for 4 monitoring events (minimum 1 year)		Compliance well and pumped effluent below 1/2 cleanup levels for 4 monitoring events (minimum 1 year)	

<sup>[1]</sup> Sentinel wells are closer to the wastes than compliance wells to provide early detection of any contaminant release. Modeling of contaminant travel times indicate it will take from months to years before a cleanup level is reached at the compliance wells.

<sup>[2]</sup> Pre-treatment before disposal to sewer will likely increase the time to complete each phase of the Contingency Plan; however, timely completion of each phase is still expected based on modeling results and technical evaluation. Temporary storage and trucking of waste effluent could be conducted if needed. NOTE: Iron, manganese, and arsenic are analytes associated with the coal mine water and monitored levels are not associated with Landsburg Mine Waste and will not be used as a trigger, unless a significant increase in concentrations occurs and an alternative source is not identified.

Under these conditions, groundwater capture will occur while contaminant concentrations remain within the Site boundaries. The Final CAP requires groundwater extraction and treatment to continue until contaminant concentrations in groundwater (at the points of compliance) and in the pumped effluent are below one-half of MTCA Cleanup Levels for four consecutive monitoring periods or a minimum of one year. Monitoring groundwater will continue indefinitely after the extraction and treatment system has been turned off.

The Final CAP has been revised to reflect the changes identified in Table 5.

6. The City of Kent commented that there is a lack of performance standards for achieving and demonstrating groundwater containment:

The City noted that the Groundwater Contingency Plan assumes a pumping rate of 40 gallons-per-minute but does not mandate “any specific rate of extraction.”

### **Ecology’s Response:**

The Groundwater Contingency Plan contains standards of performance based on achieving cleanup levels at the conditional points of compliance. By doing so, it ensures that human health and the environment are protected by preventing the migration of contaminants off-Site. The chief performance standard is that “contingency groundwater extraction and treatment would continue until groundwater at the points of compliance meets MTCA Method B cleanup levels” (see page C-7 of the Groundwater Contingency Plan). In addition, as noted above, the Final CAP has been revised to require that groundwater extraction and treatment continue until groundwater at the points of compliance and the pumped effluent are below one-half of MTCA Cleanup Levels for four consecutive monitoring periods or a minimum of one year.

Please also see Section Y(5), Ecology’s response to City of Kent’s comments on hydraulic triggers. Additional performance wells will be installed between the contingent extraction wells and the compliance wells in order to monitor containment as needed.

The estimated extraction rate of 40 gallons/minute was derived from mine records, interviews, and information on the mine dewatering system (Golder, 1996 and SubTerra, 2005). The estimated mine inflow and outflow rates are consistent with the total amount of precipitation occurring at the Site. Hydraulic containment of contaminants leaving the former mine is straightforward and bounded by the geologic structure of the mine.

Please also see Golder’s Response to Aspect Specific Comment #11 in Appendix C.

There is some uncertainty regarding the optimal (or minimal) groundwater extraction rate required for containment after the low permeability cap and surface water diversion is installed, but the pumping rates can be optimized during initial operation of the system. The Groundwater Contingency Plan has been revised to require installation of additional performance monitoring wells between the contingent extraction wells and compliance wells, which will be used in conjunction with sentinel and compliance wells to establish containment and to optimize extraction rates.



The City of Kent commented that Ecology must establish enforceable deadlines for implementation of the remedial action.

The City of Kent suggested that initial operation of the Contingent Groundwater Extraction and Treatment System should be required within one week of the “trigger” (confirmation of contaminant concentrations at or above 1/2 of the cleanup level at the point of compliance) and that hydraulic containment be complete within one month of the “trigger.”

**Ecology’s Response:**

Time tables specific to the installation and operation of the Contingent Groundwater Extraction and Treatment System will be included in the final design and O&M Plan, which will require Ecology’s approval. See also Section Y(5) and Table 5: Ecology’s responses to hydraulic triggers and response times.

Ecology’s actions are compliant with MTCA, and Exhibit C to the Consent Decree (Schedule) lays out an enforceable overall schedule for the entire remedial action. If implementation of the Groundwater Contingency Plan is required, a detailed schedule for the design, installation, and operation of the extraction and treatment system will be included in the design submittal. Due to the unknown nature (chemical composition) and depths of a potential detection of contaminants at the Site, the degree of detail on timelines and deadlines must be limited to those stated in the Groundwater Contingency Plan and in Table 5 above, identifying the revised triggers for design approval, permitting, system installation, and operation.

7. The City of Kent expressed concern about the lack of requirements to design, approve, construct, and test the Contingent Groundwater Containment System before any groundwater contamination is detected. The City suggested that Ecology require an “up-front” demonstration of the system’s ability to pump and contain contaminated groundwater

**Ecology’s Response:**

Up-front installation of the Contingent Groundwater Extraction and Treatment System is not necessary.

Pump tests at the ends of the seam and the Baker Tank Discharge conducted during the 1996 RI/FS established the hydraulic communication with water from the portal areas and water in the coal seam beneath the subsidence trench.

Due to the higher permeability of the mine workings at the portal areas compared to the adjacent sidewalls made up of Puget Group bedrock, and the comparatively narrow width of the seam (measured at about 16 feet when the coal was boomed and extracted), pumping at this zone is expected to be highly effective. This geologic structure provides a boundary for groundwater

containment. The maximum rate of groundwater extraction for containment of contaminants flowing out of the former mine would be the amount of water entering the former mine.

Furthermore, since the amount of water entering the former mine will be changed by placing a low permeability cap and diverting surface waters from entering the north mine subsidence trenches, the value of any containment study conducted before those remedial actions are implemented would be questionable after the remedial actions are constructed.

The installed system will be capable of handling the maximum amount of groundwater emanating from the former mine and will contain the contamination. Groundwater extraction rates for containment can be determined and optimized during the initial operation of the extraction system (with adequate performance/observation well monitoring). Please also see Section Y(5) (hydraulic containment triggers).

8. The City of Kent commented that the DCAP's assumptions about groundwater disposal facilities were speculative. The City questioned whether the sanitary sewer system has the capacity to simultaneously serve both the local school district and the Site's contingent groundwater system. The City noted that Tahoma School District No. 409 has expressed concern that the Site's use of the sewer system will impact the planned construction of a new school next to the existing junior high school and that the district would seek compensation for the Site's use of the sewer line, which could delay implementation of the Groundwater Contingency Plan.

### **Ecology's Response:**

The design of infrastructure for the Contingent Groundwater Extraction and Treatment System was based on engineering analysis and designs for disposing of pre-treated water from the Site, should groundwater extraction and disposal be needed. In 2006, Ecology amended the Agreed Order to require the installation of this infrastructure after undergoing a public comment period and issuing a responsiveness summary that addressed the comments above. King County reviewed and approved of the infrastructure plan, provided that the pipeline remains unconnected until such time that it is needed (see letter from Karen Wolf to Jerome Cruz in Appendix A of the Groundwater Contingency Plan).

Subsequently, Golder Associates (technical consultants to the PLP Group) confirmed that there is sufficient capacity to handle the combined discharges of the school and the Contingent Groundwater Extraction and Treatment System. Additionally, the treated groundwater can be temporarily stored during school hours for later disposal.

Other options (trucking, recirculation) will be explored if substantial unforeseen hurdles are raised with regard to connection of the infrastructure to the Soos Creek Water and Sewer District's sanitary sewer line.

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## **Z. Determination of Compliance Boundary for Groundwater Protection Area**

1. The City of Kent commented that the points of compliance for groundwater are “arbitrarily aligned” with the property boundary and that a "carved out" area near the south portal should be included within the Groundwater Protection Area.

### **Ecology’s Response:**

The compliance boundary for the Groundwater Protection Area is an important component for maintaining long-term protectiveness at the Site. Coupled with the Groundwater Contingency Plan and infrastructure, institutional controls on groundwater and portal water use, and long-term groundwater monitoring, risks from groundwater to public health and the environment are avoided by preventing human exposure to Site groundwater if Site groundwater were to become contaminated by waste constituents.

The Groundwater Protection Area is the area of land where institutional controls will be placed prohibiting the withdrawal and use of groundwater, in order to minimize risks of potential contamination flowing into these areas from the waste area (either as porous flow across bedding planes or through fractures). The protection area serves as a safeguard by prohibiting groundwater use in the areas that extend orthogonally along the length of Rogers seam mine workings.

The Groundwater Protection Area encompasses the Site as well as areas west and east of the Roger’s seam (which is where the wastes are located in the northern trench at the top of the hill). First, the Groundwater Protection Area extends westward and eastward and is bounded by the Frasier and Landsburg coal seams, respectively. The Frasier and Landsburg seams are also former coal mines, and they form hydrogeologic line sinks to which laterally flowing groundwater in the bedrock drains to and discharges via the portals. These hydrogeologic sinks, for the most part, comprise the west and east hydraulic boundaries for groundwater to the west and east, respectively, of the Rogers seam (where the wastes are located). Any risks to groundwater further away from the Site along this west-east direction are reduced to nonexistent, due to groundwater flow toward these hydrologic line sinks. The compliance boundary for the Groundwater Protection Area was established based on technical reasons.

Second, this compliance boundary for the Groundwater Protection Area is based on the conceptual site model of groundwater flow and potential contaminant transport at the Site. In combination with other components of the CAP, it ensures future conservative protection at the Site from potential exposure should a release of contamination from the wastes occur.

The “carved out” section the City of Kent refers to is a small parcel on the southwest edge, which was sold to a private landowner (the small parcel is described in Exhibit E-2). There is an access agreement between the private landowner and the PLP Group to sample the monitoring well that is located on the small parcel (LMW-5). Ecology determined that with respect to

institutional controls on properties not owned by a PLP, MTCA requires a “good faith effort to obtain” a restrictive covenant and does not unconditionally mandate that environmental covenants be recorded on such properties (see WAC 173-340-440(8)(c)). If the “good faith effort” fails to secure a covenant on the property, “other legal or administrative mechanisms” may be employed as institutional controls (see WAC 173-340-440(8)(c)). The PLPs will conduct a “good faith effort to obtain” an environmental covenant for the privately-owned small parcel (Exhibit E-2) when the Consent Decree is filed. The PLP Group will also record the environmental covenant for the Site within 10 days of Ecology’s written approval of the as-built drawings for the low permeability soil cap.

2. The City of Kent expressed concern about the DCAP’s distinction between sentinel wells and compliance wells, as well as the location of each.

The City commented that the DCAP fails to establish the requirements of WAC 173-340-720(8)(b) for using a conditional point of compliance, and suggested that the standard point of compliance be used for both sentinel and compliance wells.”

### **Ecology’s response:**

The City of Kent cites WAC 173-340-720(8)(b) for how MTCA sets conditional points of compliance:

**“Conditional point of compliance.** Where it can be demonstrated under WAC 173-340-350 through 173-340-390 that it is not practicable to meet the cleanup level throughout the site within a reasonable restoration time frame, the department may approve a conditional point of compliance that shall be as close as practicable to the source of hazardous substances, and except as provided under (d) of this subsection, not to exceed the property boundary. Where a conditional point of compliance is proposed, the person responsible for undertaking the cleanup action shall demonstrate that all practicable methods of treatment are to be used in the site cleanup.”

To date, Site investigations and groundwater monitoring have found no contamination of groundwater emanating from the mine or other impacts to water quality, making it technically difficult and impracticable to set a standard point of compliance at this Site as is typically done under MTCA.

The requirements under WAC 173-340-350 through 173-340-390, regarding impracticability to meet cleanup levels throughout the Site, were sufficiently met by completion of the RI/FS report in 1996, public comment on the RI/FS report, completion of the DCAP, and public comment on the DCAP. The selected remedy is appropriate given the conceptual site model, the presence of wastes, and the conservative assumption that groundwater contamination coming from within the former mine could occur in the future. The Site conditions and remedial design concepts in the CAP necessitate conditional points of compliance for groundwater.

Under MTCA, a conditional point of compliance must be located “as close as practicable” to the source of contamination. WAC 173-340-720(8)(b). MTCA defines “practicable” as “capable of

being designed, constructed and implemented in a reliable and effective manner including consideration of cost.” WAC 173-340-200. The sentinel wells are “early warning” wells, which trigger active remediation at the Site to prevent the potential migration of contaminated groundwater past Site boundaries, making them an important component of the monitoring program and the overall remedy. Based on contaminant travel modeling and the time it takes to implement the engineered remediation system in the Groundwater Contingency Plan, it would not be practicable to designate the sentinel wells as conditional point of compliance wells. Rather, the compliance wells, as specified in the DCAP, constitute conditional points of compliance located as close as practicable to the source of hazardous substances (i.e., trench wastes), because they must be located at an optimum distance to implement groundwater containment and treatment in a timely manner while preventing migration into the environment in order to be implemented in a reliable and effective manner. The sentinel wells cannot practicably achieve such compliance under these specific Site conditions.

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## **AA. Covenant Not to Sue and Contribution Protection**

The City of Kent commented that unless and until the Groundwater Contingency Plan is triggered, the remedial action requirements imposed on the PLP Group by the Consent Decree are insufficient to justify the scope of the decree’s covenant not to sue and contribution protection provision. The City expressed concern that the PLP Group will not provide sufficient financial assurance for potential remedial actions beyond installation of the low-permeability cap. The City suggested that the decree’s covenant not to sue and contribution protection provision should be conditioned on the PLP Group’s future implementation of the Groundwater Contingency Plan. The City also expressed concern that a containment remedy cannot achieve remediation within a reasonable restoration time.

### **Ecology’s Response:**

The CAP takes a precautionary approach in its remedial design. Ecology believes that the Consent Decree’s covenant not to sue and contribution protection provisions are suitable for this cleanup based on the appropriate level of remedial activities and design for the whole Site, including the Cap Protection Area and the surrounding Groundwater Protection Area. Applying institutional controls to the Groundwater Protection Area was included as an added safety factor for possible groundwater contamination in bedrock west and east of the waste area. The level of response and design was achieved by recognizing the lower permeability of surrounding bedrock in the Groundwater Protection Area, and conversely, the higher permeability and hydraulic responsiveness within the former mine, including the points of compliance at the north and south portals of the former mine. Additionally, the Frasier and Landsburg seams (which are located at the west and east ends of the Groundwater Protection Area) will continue to be part of the long-term monitoring network for the Site.

Given the lack of current impacts to groundwater discharging from the mine and the Site’s geologic/hydrogeologic conditions, institutional controls are appropriate for the Groundwater Protection Area. The Contingent Groundwater Extraction and Treatment System (including pumping) and other remedial activities in the Groundwater Contingency Plan are appropriate

(based on the conceptual site model and Site conditions) and ensure the protectiveness of the cleanup.

Please also refer to Ecology's response in Section Z ("Determination of Compliance Boundary for Groundwater Protection Area") with regard to determining the boundaries for the Groundwater Protection Area.

Because no impacts to mine discharging groundwater have been detected at the Site, an estimate of groundwater restoration time is not achievable until such time that groundwater contamination actually is observed at the Site. Accordingly, Ecology believes the covenant's reopener provisions (B.3 and B.4) based on the reasonable restoration timeframe set forth in the CAP remain valid and appropriate.

It should be noted that the reopener provision in the Consent Decree authorizes Ecology to require additional remedial action from the PLPs if Ecology determines that such actions are necessary to abate an imminent and substantial endangerment to human health and the environment. If new information on groundwater, hazardous substances, or Site information relating to the implementation of the Groundwater Contingency Plan comes to light that would trigger a reopener, Ecology will reopen the Consent Decree.

Similarly, Ecology may need to reopen or amend the Consent Decree if and when the Groundwater Contingency Plan is triggered, since at that point Ecology will have the information regarding the types and quantities of hazardous substances in the groundwater necessary to design and implement the Contingent Groundwater Extraction and Treatment System.

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## **BB. Land Use Restrictions**

The City of Kent expressed concern about the scope of the environmental (restrictive) covenants attached as Exhibits F-1 and F-2 to the draft Consent Decree and their adequacy as institutional controls for the Site. The City suggested that the covenants should be modified to (1) eliminate provisions that allow for termination of the covenant, and (2) add a provision that would trigger "expansion" of the area to which institutional controls apply in the event that groundwater contamination migrates off-Site.

### **Ecology's Response:**

The environmental covenant will be recorded on the Site property and immediately surrounding properties, which will substantially limit land uses and prohibit groundwater use in an effort to minimize any risk that wastes in the mine could be disturbed. Additionally, if any inconsistent land use is proposed on a property encumbered by the covenant, such use must first be approved by Ecology. Finally, the covenants cannot be removed without Ecology's approval.

See Ecology's response in Section Z ("Determination of Compliance Boundary for Groundwater Protection Area") regarding the boundaries of the Groundwater Protection Area. The compliance boundary for the Groundwater Protection Area was scaled as appropriate to the

hydraulic boundaries, cross flow directions, and ownership constraints explained previously. The CAP provides a scope of work that extends beyond the Cap Protection Area, including long-term monitoring, institutional controls, installation of the Contingent Groundwater Extraction and Treatment System, and O&M.

Due to the geology and hydrology of the Site and the lack of groundwater contamination migrating from the waste disposal area, Ecology does not see a need for additional provisions to expand the institutional controls or the “Groundwater Protection Area” beyond their present extents at this time. The southwestern extent of the “Groundwater Protection Area” extends to property boundaries in order to provide as much buffer as practicable and controllable by the PLPs. Technically, the bedrock adjacent to the western side of the Rogers mine workings appears to be currently discharging groundwater into the Rogers mine interior, rather than from the mine interior to adjacent western bedrock, as evidenced by the groundwater levels observed during the drilling of LMW-11 (installed through bedrock on the southern portion of the Rogers mine).

Although impacted groundwater should not migrate westerly through the adjacent bedrock beyond the proposed southwestern “Groundwater Protection Area” boundary, any potential groundwater contamination migrating south within the Rogers mine toward the south portal (Portal #3) will be detected by the array of sentinel wells, which would trigger additional remedial actions including containment of contaminated groundwater. Ecology believes that the “Groundwater Protection Area” is sufficiently protective; if contamination migrates toward the south portal, it will be detected and contained before any contamination can migrate beyond the “Groundwater Protection Area” along the southwestern and southern boundaries. These conditions reduce the concern about including the southwest parcel within the compliance boundary.

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## **CC. Five Year Periodic Reviews**

1. The CRC suggested that the Consent Decree should include provisions that address (1) how periodic reviews will involve adaptive management for O&M requirements, and (2) how the public will be involved in those reviews.”

### **Ecology’s Response:**

The five-year periodic review process required under MTCA and incorporated in the Consent Decree (see Section XXVI) embodies the adaptive management approach to the cleanup by (1) requiring periodic assessment of the progress of the cleanup to confirm continued protection of human health and the environment, and (2) establishing Ecology’s right to require further remedial actions at the Site under certain circumstances. For example, Ecology is authorized under Section XVIII.B of the Consent Decree to require additional remedial action if Ecology determines that such action is necessary to abate an imminent and substantial endangerment to human health or the environment.

WAC 173-340-420(4) establishes the criteria by which Ecology evaluates whether human health and the environment are being protected through the review of post-cleanup Site conditions and monitoring data. If Ecology determines that substantial changes to the CAP are necessary to protect human health and the environment in light of its evaluation under the criteria in WAC 173-340-420(4), a revised CAP shall be prepared, which would be subject to public notice and comment. In addition, Ecology's periodic review will be published in the Site Register and is subject to the public notice and comment provisions of WAC 173-340-600. The Site Register is typically published every two weeks. If you would like to be placed on the Site Register's e-mailing list, complete the electronic form at:

<https://listserv.wa.gov/cgi-bin/wa?SUBED1=siteregister&A=1>.

The periodic review report will also be announced and made available for download at Ecology's website for the Landsburg Mine Site (see link on page 4).

Based on the above, Ecology believes that these sections of the Consent Decree, coupled with MTCRA requirements for periodic reviews, provide for adaptive management and administrative flexibility in the event of changing Site conditions, changing maintenance and monitoring requirements, or need for further remedial action.

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## **VI. Health Consultation by the Washington Department of Health**

During the 2013 public comment period, the City of Kent submitted to Ecology a letter dated December 12, 2013, to the Washington State Department of Health's Office of Environmental Public Health Sciences requesting that it "undertake appropriate site investigation, consultation, and reporting actions" regarding the Site. In response to the City's request, the Department of Health (DOH) completed a Health Consultation report on November 16, 2016, entitled "Site Characterization Evaluation Landsburg Mine Site King County, Washington."

DOH concluded that:

- The Site poses a potential chemical health hazard. The extent of the potential hazard is unknown.
- Except for arsenic, none of the chemicals found in groundwater at the Site in May and November 2013 and June 2014 are a public health hazard. Although the maximum level of arsenic found in the groundwater presents some risk of causing long-term health effects, the levels are below state and federal drinking water standards.
- The Site poses a physical hazard.

DOH provided the following recommendations:

- Before placing the soil cap, install and measure water levels in an appropriate number of monitoring wells to determine the location of the groundwater divide within the former mine.
- Before placing the soil cap, install and sample additional monitoring wells at the north end of the mine to better assess whether contaminants are being released from the mine.



- Provide information about the City of Kent's Clark Springs' municipal drinking water system, Covington Water District system, and Cedar Valley Sole Source Aquifer (used by the City of Renton).
- Conduct a well survey to identify private wells installed in the area and include language in the final CAP requiring additional well surveys in the future.
- Test private wells closest to the north and south portals annually for five years for the same chemicals as the monitoring wells. Re-evaluate the need for further private well testing as part of the five-year Site review.
- Test private wells east and west of the waste disposal area annually for five years and re-evaluate the need for further testing at the five-year review unless it can be confirmed the groundwater from the surrounding bedrock discharges into the mine rather than flowing away from the mine.
- Sample and analyze trench rim samples for volatile organic compounds (VOCs).
- Test surface water at portals #2 and #3.
- Modify the CAP to explain why pumping tests are not feasible and explain what steps will be taken to ensure that the contaminants do not migrate beyond the Site boundaries.
- Maintain the existing fencing around the waste disposal area and add warning signs explaining why the area is fenced.

Ecology will carry out the following tasks in response to the recommendations from DOH:

- Modify the CAP to require collection of water level data from Site wells (including the additional sentinel wells) to better define the location of the groundwater divide.
- Modify the CAP to set the proposed deeper northern sentinel well at a mid-level depth that would give better vertical groundwater coverage for possible contamination that could come from the mine. If logistically possible, the shallow and deeper northern sentinel wells will be moved within the inclined northern mine shaft location or as close as possible.
- Modify the CAP to require consideration of additional monitoring wells in the southern portion of the mine if the groundwater divide is found to be located beneath any portion of the former waste disposal area.
- Modify the CAP to include information about the City of Kent's Clark Springs' municipal drinking water system, Covington Water District system, and Cedar Valley Sole Source Aquifer.
- Modify the CAP to require the PLPs to conduct private well surveys near the Site during the five-year periodic Site reviews.
- Modify the CAP to require the PLPs to test active private wells closest to the north and south portals annually for five years for the same chemicals as the monitoring wells.
- Modify the CAP to require the PLPs test the soil just outside of the proposed cap edge for volatiles.
- Modify the CAP to require the PLPs conduct limited surface water testing at the north and south portals prior to remedial construction and performance monitoring (see Compliance Monitoring Plan, Table A-2).
- Modify the CAP to explain why pumping tests are not feasible and explain (or highlight) what steps will be taken to ensure that the contaminants do not migrate beyond the Site.
- Notify the PLP Group that existing and future fencing around the waste area must be

properly maintained and that signage must be posted that explains why it is being fenced.

The full health consultation can be viewed at [www.doh.wa.gov/consults](http://www.doh.wa.gov/consults).

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## **VII. Summary of Changes made to Final CAP and Consent Decree**

In response to public comments, and as described more fully throughout these responses, Ecology has made the following changes to the Final CAP, which the PLPs will be obligated to implement under the Consent Decree:

- Require that the sentinel wells be installed before construction of the cap (see response in section K).
- Increase the frequency of long-term monitoring (after 10 years) at the southern sentinel and compliance wells. For long-term (continuous) groundwater monitoring, all analyte parameters will be monitored at a frequency of once every five years at the south sentinel and compliance wells, instead of once every 10 years (see Table 4 of this document). This increased frequency will also provide Ecology with a full suite of analysis for every five-year review.
- Add the chemical 1,4-dioxane to the suite of analytes to be tested during compliance monitoring when required to use EPA Method 8270.
- Clearly define the use of the word “indefinitely” for the cleanup (see response in section S).
- Revise triggers for implementing the Groundwater Contingency Plan. An accelerated schedule for implementing the extraction and treatment system will be achieved according to this revised set of triggers (see Table 5 of this document). These revised triggers allow implementation of the system much earlier than the previous plan and thus provides added protection to public health and the environment.
- As a precautionary measure, require additional performance wells for determining containment of the contaminant plume during groundwater extraction if the system becomes operational. The compliance wells will be used for confirmation that contaminated groundwater does not migrate off-Site.
- Incorporate the public health actions that Ecology has agreed to take in response to DOH’s health consultation recommendations.

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-END OF PUBLIC COMMENTS RECEIVED AND RESPONSES-

## **APPENDICES**

**Appendix A: Copies of Written Comments (including CD containing City of Kent comment document)  
Timothy LaPorte, City of Kent Public Works**



**PUBLIC WORKS DEPARTMENT**

Timothy J. LaPorte  
Public Works Director  
400 West Gowe  
Kent, WA 98032  
Fax: 253-856-6500

PHONE: 253-856-5500

October 9, 2013

**VIA EMAIL and U.S. MAIL**

Robert W. Warren (rwar461@ecy.wa.gov)  
Section Manager  
Toxics Cleanup Program, NWRO  
Washington Department of Ecology  
3190 – 160<sup>th</sup> Avenue SE  
Bellevue, Washington 98008-5452

**RE: Landsburg Mine Site—Request to Extend Public Comment Period**

Dear Mr. Warren:

I write on behalf of the City of Kent ("City") to request that Washington's Department of Ecology ("Ecology") extend by thirty (30) days (to December 11, 2013) the public comment period for the proposed Landsburg Mine Site consent decree and draft cleanup action plan. Per the most recent Ecology Site Register, Ecology has established the comment period to run from October 11 to November 11, 2013. The City believes that additional time is necessary for the City and the public to adequately review, assess, and prepare comments on the complex materials at issue. The materials comprise over 550 pages of detailed technical and legal requirements. Ecology and the Landsburg PLP Group have worked on the preparation of the materials for many years—that fact alone demonstrates the complexity of the issues presented, and the inadequacy of the announced 30-day comment period.

We will appreciate your consideration of this request, and your response as soon as possible. Thank you.

Sincerely,

A handwritten signature in blue ink that reads "Timothy LaPorte".

Timothy LaPorte  
Public Works Director

cc: Dori Jaffe, Assistant Attorney General  
Jerome Cruz, Ecology Site Manager

www.ci.kent.wa.us

MAYOR SUZETTE COOKE

City of Kent Public Works Department

## **Gary Habenicht**

-----Original Message-----

**From:** Gary Habenicht [mailto:gbhabenicht@gmail.com]

**Sent:** Thursday, October 24, 2013 8:25 PM

**To:** Cruz, Jerome (ECY)

**Subject:** Landsburg Mine Site

**Jerome:**

My name is Gary Habenicht and I have lived close to the area in question for many years as I am fourth generation to the Landsburg / Ravensdale area.

I had planned to be at the public meeting but other commitments prevented my presence. The question I would have asked is why cover the site? I suspect that it is part of an already agreement, but still why cover it, why spend that kind of money, money that could be used elsewhere or not at all?

The northern half of the cave in or fill site is remarkable habitat and sanctuary for the black bear. I have had three sightings this summer already. It is my contention that the cave in location is where bear(s) den up for the winter.

Anyway just a little more input to the project.. I can be reached by e-mail or by phone at 206-571-2802.

Sincerely

Gary Habenicht

Jim Lee



**Landsburg Mine Cleanup Site  
Comment Period: October 11 – December 12, 2013**

Ecology would like to hear from you regarding the Landsburg Mine Site. You may mail this form to: Department of Ecology, ATTN: Jerome Cruz, Site Manager, 3190 160<sup>th</sup> Ave SE, Bellevue, WA 98008 or email your comments to [jerome.cruz@ecy.wa.gov](mailto:jerome.cruz@ecy.wa.gov). Please indicate Landsburg Mine Site in your subject line.

**Please print clearly**

Name: Jim Lee  
Organization/Neighborhood: Landsberg estates  
Mailing Address: 24916 267 th Ave SE  
City: Ravensdale State: WA Zip: 98051  
Email: Leejh4@earthlink.net  
Phone Number: 425 432-8257

Comments (if you need more space, please use the backside.):

Our well is 500 feet from the mine's north end.  
It should be tested for contaminants  
at least once a year. It has not  
been tested since 1993 except our own  
testing for E-coli.

**Bill & Jane Nation**



**Landsburg Mine Cleanup Site  
Comment Period: October 11 – December 12, 2013**

Ecology would like to hear from you regarding the Landsburg Mine Site. You may mail this form to: Department of Ecology, ATTN: Jerome Cruz, Site Manager, 3190 160<sup>th</sup> Ave SE, Bellevue, WA 98008 or email your comments to [jerome.cruz@ecy.wa.gov](mailto:jerome.cruz@ecy.wa.gov). Please indicate Landsburg Mine Site in your subject line.

**Please print clearly**

Name: Bill & Jane Nation  
Organization/Neighborhood: \_\_\_\_\_  
Mailing Address: 25113-265 THAVE, SE,  
City: Ravensdale State: Wa. Zip: 98051  
Email: JANESDO115@YIPCOM.NET  
Phone Number: (425)432-4031

Comments (if you need more space, please use the backside.):

1. Wild life lives on this land. What happens to them?
  2. What happens to our property value?
  3. Monitoring our personal wells for 4 home owners.
  4. Noise & pollution when we're across the road.
- \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



## **Gretchen Gibbs**

-----Original Message-----

**From:** Gretchen [mailto:gretch751@yahoo.com]  
**Sent:** Sunday, October 27, 2013 9:18 AM  
**To:** Cruz, Jerome (ECY)  
**Subject:** Landsburg Mine Site

Hello Department of Ecology, Jerome Cruz,

We have reviewed information shown at your Landsburg Mine Site Public Comment Period Extension meeting on 10/24/2013. We do not see evidence of even the bare minimum due diligence needed to correctly assess what danger the vast quantity of Toxic, Hazardous Waste poses to Our local School, Residents, OR the Cedar River and Green River Watersheds. There are Material flaws in the current approach and plan. We need to have a proactive and independent third party involved with a much more rigorous design for monitoring the site, including an approach that uses automated sensors and sampling as a core component of the monitoring protocol.

Gretchen Gibbs

## **Jon Parkinson**

**From:** Jon Parkinson [mailto:parkinson343@gmail.com]  
**Sent:** Monday, October 28, 2013 10:49 AM  
**To:** Cruz, Jerome (ECY)  
**Subject:** Landsburg Mine Site

Hello Department of Ecology, Jerome Cruz,

We have reviewed information shown at your Landsburg Mine Site Public Comment Period Extension meeting on 10/24/2013. We do not see evidence of even the bare minimum due diligence needed to correctly assess what danger the vast quantity of Toxic, Hazardous Waste poses to Our local School, Residents, OR the Cedar River and Green River Watersheds. There are Material flaws in the current approach and plan. We need to have a proactive and independent third party involved with a much more rigorous design for monitoring the site, including an approach that uses automated sensors and sampling as a core component of the monitoring protocol.

Thank You,

Jon Parkinson  
27548 247th Ct SE  
Maple Valley, WA 98038  
425-736-6111

## **Craig Weinstein**

-----Original Message-----

From: Craig Weinstein [mailto:caweinstein4@gmail.com]

Sent: Monday, October 28, 2013 4:43 PM

To: Cruz, Jerome (ECY)

Cc: A Weinstein

Subject: Landsburg Mine Site

Hello Department of Ecology, Jerome Cruz,

We have reviewed information shown at your Landsburg Mine Site Public Comment Period Extension meeting on 10/24/2013. We do not see evidence of even the bare minimum due diligence needed to correctly assess what danger the vast quantity of Toxic, Hazardous Waste poses to Our local School, Residents, OR the Cedar River and Green River Watersheds. There are Material flaws in the current approach and plan. We need to have a proactive and independent third party involved with a much more rigorous design for monitoring the site, including an approach that uses automated sensors and sampling as a core component of the monitoring protocol.

Respectfully,

Craig Weinstein  
Maple Ridge Resident

John McTighe



**Landsburg Mine Cleanup Site  
Comment Period: October 11 – December 12, 2013**

Ecology would like to hear from you regarding the Landsburg Mine Site. You may mail this form to: Department of Ecology, ATTN: Jerome Cruz, Site Manager, 3190 160<sup>th</sup> Ave SE, Bellevue, WA 98008 or email your comments to [jerome.cruz@ecy.wa.gov](mailto:jerome.cruz@ecy.wa.gov) Please indicate Landsburg Mine Site in your subject line.

**Please print clearly**

Name: JOHN MCTIGHE  
Organization/Neighborhood: LANDSBURG ESTATES WATER DIST.  
Mailing Address: 24929-267 AVE SE  
City: RAVENSDALE State: WA. Zip: 98051  
Email: RATTIER100@MSN.COM  
Phone Number: 206-660-8308

Comments (if you need more space, please use the backside.):

I WOULD LIKE OUR  
COMMUNITY WELL SERVING 267<sup>th</sup> AVE. SE IN  
RAVENSDALE OFF SUMMIT LANDSBURG ROAD TESTED FOR  
CONTAMINANTS & ORGANIC MATERIAL AS WAS DONE ONLY  
A COUPLE TIMES IN THE 1980'S. THE WELL IS LOCATED  
PROBABLY 300 FT. NORTHWEST OF THE NORTH PORTAL OF THE  
ROGERS SEAM. I WOULD ALSO LIKE AN EMAIL ADDRESS  
AND WEBSITE TO ENABLE ME TO SUBMIT MORE COMMENTS  
ON THIS SUBJECT POTENTIALLY AFFECTING MINE & MY NEIGHBORS  
DRINKING WATER.

**From:** John McTighe [mailto:rattler100@msn.com]  
**Sent:** Saturday, November 02, 2013 11:39 PM  
**To:** Cruz, Jerome (ECY)  
**Subject:** Landsburg Mine Site

Hello Jerome,

I was at the public meeting at Tahoma Junior High School that was held at the end of October. I submitted a comment by writing at that time but I want to go on record by email also.

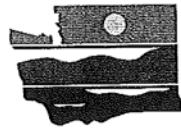
I live on 267th Ave. SE which is slightly northwest of the North Portal of the mine. We have a well that serves the eight separate residences on 267th Ave. SE Ravensdale, Wa. 98051. My address is 24929 267th Ave. SE Ravensdale, Wa. 98051. I believe it has been over 20 years or more since our well was checked for organic contaminants and I would like to have our well put on any future testing that is done. I know the wells that are near the Clark Springs area where the City of Kent has a major source of water has been monitored with testing and would like the same done for our well on 267th Ave. SE in Ravensdale, Wa.

It would alleviate much worry about the state of the water source that provides drinking water and other water use for the eight residences located here on 267th Ave. SE

Sincerely, John McTighe

206-660-0308 cell  
425-432-3836 home

Sam R. Gallant



DEPARTMENT OF  
**ECOLOGY**  
State of Washington

RECEIVED

NOV 05 2013

DEPT OF ECOLOGY  
TCP - NWRO

**Landsburg Mine Cleanup Site**  
**Comment Period: October 11 – December 12, 2013**

Ecology would like to hear from you regarding the Landsburg Mine Site. You may mail this form to: Department of Ecology, ATTN: Jerome Cruz, Site Manager, 3190 160<sup>th</sup> Ave SE, Bellevue, WA 98008 or email your comments to [jerome.cruz@ecy.wa.gov](mailto:jerome.cruz@ecy.wa.gov) Please indicate Landsburg Mine Site in your subject line.

**Please print clearly**

Name: Sam R. Gallant

Organization/Neighborhood: \_\_\_\_\_

Mailing Address: 27515 SE 253 St

City: Ravensdale State: Wa Zip: 98051

Email: sam107g1t@yahoo.com

Phone Number: 425-584-7040

Comments (if you need more space, please use the backside.): Landsburg Mine  
I think covering over this site is just a band-aid to a much  
more potential catastrophe in the future. You think all of these  
drums of hazardous materials have already leaked out but you don't  
know that for a fact. If they do leak in the future they could  
potentially effect millions of water users through out King County.  
You say you have monitored lots of neighborhood wells for years but  
no one has ever monitored or checked my well and I am downhill  
and probably closer to the Cedar River than anyone in the vicinity. I  
know that tons of Hydrocarbons were dumped here for years from talking with the  
owner of the Superfund Site in Kent Valley he bragged about it. This is not the  
answer although would be very beneficial to your clients paying for this. This  
should have been addressed 20 years ago and now you get to do something  
to show that you are taking it seriously if it had been in Seattle or Bellevue this  
would have been addressed 25 years ago or know one would have ever allowed  
anyone to dump this crap here in the FIRST PLACE!! Sam R. Gallant

# City of Kent Mayor Suzette Cooke



**OFFICE OF THE MAYOR**  
Suzette Cooke, Mayor  
220 4th Avenue South  
Kent, WA 98032  
Fax: 253-856-6700

**PHONE: 253-856-5700**

November 7, 2013

Maia D. Bellon, Esq., Director  
Washington State Department of Ecology  
P.O. Box 47600  
Olympia, WA 98504-7600

Re: Landsburg Mine Site -- Draft Clean-up Action Plan  
Request for Meeting to Discuss City of Kent's Concerns

Dear Ms. Bellon:

I write on behalf of the City of Kent (Kent) to request a meeting with you to discuss our very significant concerns about the Landsburg Mine Site and the recently issued Draft Cleanup Action Plan (DCAP).

From 1959-1975, nearly 450,000 gallons of liquid industrial waste (among other known and unknown hazardous materials) were dumped into the Landsburg Mine located between Maple Valley and Ravensdale. This poses a serious water quality and public health concern to Kent, as the now-abandoned mine is located within 1,000 feet of the Clark Springs property, the source of our community's primary water supply. The DCAP provides that the hazardous wastes will not be removed and will remain in the mine — meaning that a serious threat to the Kent water supply, as well as to the Cedar River and many nearby residential drinking wells, will remain in the ground forever.

Ecology recently issued the DCAP and a draft consent decree for public review (the ongoing public comment period ends Dec. 12, 2013). Kent has worked on this matter with Ecology for many years, and while we appreciate the efforts of your principal staff, we continue to have numerous concerns about the proposed approach to dealing with this site.

Given that it is still fairly early in your tenure as Director and you have not had an opportunity to hear directly from us, we request a face-to-face meeting with you to discuss the serious concerns we have. We recognize you will want your staff in attendance as well.

www.ci.kent.wa.us

© MAYOR SUZETTE COOKE

Kent will submit detailed written comments to Ecology in opposition to the DCAP and draft consent decree. These concerns include:

- 1) Lack of site investigation (no waste characterization);
- 2) Incomplete understanding of site hydrology;
- 3) Unknown waste migration since disposal;
- 4) Speculation and unproven assumptions used to justify the DCAP;
- 5) No removal of any waste proposed;
- 6) Inadequate monitoring plan may be terminated in the future;
- 7) Unproven "contingency plan" assumes contaminated groundwater can be contained quickly after it is detected before polluting/stigmatizing the surrounding water resources; and
- 8) Financial assurance fails to ensure that PLPs will be solvent when required to address the site's conditions, even as provided by the DCAP.

In short, we are very concerned the DCAP fails to satisfy MTCA's requirements. The proposal is a minimalist approach to site investigation and remediation, contrary to Ecology's duty to protect and preserve precious water resources.

We request a meeting with you as soon as possible to discuss the Landsburg Mine Site. It is the City's goal to protect the environment and our municipal water supplies now and for future generations.

I would ask that your staff contact my Executive Assistant Patrick Briggs [pbriggs@kentwa.gov](mailto:pbriggs@kentwa.gov) to schedule this meeting.

Thank you for your consideration.

Sincerely,



Suzette Cooke  
Mayor

## Jason Howell

**From:** jason.howell@h2observe.com [mailto:jason.howell@h2observe.com]  
**Sent:** Wednesday, November 13, 2013 8:28 PM  
**To:** Cruz, Jerome (ECY); Warren, Bob (ECY); Altose, Larry (ECY)  
**Cc:** kpeterson@ci.kent.wa.us; karen.smith@covingtonwater.com; kevin.scott@H2Observe.com; Eric.Knudsen@H2Observe.com  
**Subject:** ACTION REQUIRED: Landsburg Mine Site Public Comment Period Extension meeting on 10/24/2013

Hello Department of Ecology, Jerome Cruz, Robert Warren, Larry Altose,

I have, speaking on behalf of our community, reviewed information shown at your Landsburg Mine Site Public Comment Period Extension meeting on 10/24/2013. We do not see evidence of even the bare minimum due diligence needed to correctly assess what danger the vast quantity of Toxic, Hazardous Waste poses to Our local School, Residents, OR the Cedar River and Rock Creek Watersheds. There are Material flaws in the current approach and plan. We need to have a proactive and independent third party involved with a much more rigorous design for monitoring the site, including an approach that uses automated sensors and sampling as a core component of the monitoring protocol.

For next steps, please contact me at: <http://www.H2Observe.mobi> or [jason.howell@H2Observe.com](mailto:jason.howell@H2Observe.com)

See detail below.

Thank You - Jason Howell

---

### Summary of materially ineffectual, probable non-compliance or conformance items:

- No actual, empirical (e.g., Travel time-, Dye-based) studies have ever been performed at the site; leaving BIOSCREEN modeling software as the main mechanism for setting frequency of monitoring
- The hydrodynamics surrounding the site remain effectively unknown, even to all the experts involved
- No contaminants have ever been found leaking at the site
- Current and planned well count and positioning, sampling type and frequency are simply not adequate or reasonable for the nature and volume of toxic compounds soaked into the Cedar and Rock Creek watersheds
- The proposed monitoring regimen is simply not effective day-to-day, nor in the event of a catastrophic event (e.g., earthquake)
- Although it is legal to use the word 'cleanup' to describe the plan; it does not in fact constitute a true cleanup; rather, the 'Cleanup Consent Decree' describes a literal



coverup of an unplanned, unregulated hazardous waste dump – directly adjacent to, and in, the Cedar River and Rock Creek watersheds. It also sits directly adjacent to Tahoma Junior High School, a facility that was planned and constructed very recently, with no effectual controls in proximity to the school.

Documented references that illustrate the major, material shortcomings within the Cleanup Consent Decree and Draft Cleanup Action Plan:

- **Page #38, Section 5.5.5.3 Confirmational Monitoring:**

*“...Long-term confirmational groundwater monitoring and Site inspections and maintenance will continue until residual hazardous substance concentrations no longer exceed cleanup or remediation levels as described in the CAP resulting from either (1) the application of new remediation technologies currently unavailable or (2) other circumstances or conditions that affect residual concentrations such that they no longer pose risk to human health or environment.”*

  - ➔ Legally, this likely functions as a boilerplate escape clause for the PLP group
  - ➔ Effectively, this likely functions as a mechanism to bypass or override timely identification of legitimate public health impacts, originating directly from the hazardous dumping site
  
- **Page #40, Section 5.5.5.4:**

*“...Confirmational monitoring would start at the completion of the remedial action in sentinel and compliance wells. The confirmational frequency would be quarterly for the first year, semi-annual for the next four years, and annual for the next five years. After ten years, the confirmational monitoring will decrease in frequency again, but the frequency will be analyte- and well location dependent, as follows:*

  - {NORTH} LMW-2, LMW-4, LMW-10, Deep North Sentinel Well (yet to be installed), Shallow North Sentinel Well (yet to be installed), LMW-6, and LMW-7 will have a monitored frequency of 2.5 years for VOCs and TPH; and every 5 years for metals, SVOCs, PCBs, and chlorinated pesticides.
  - {SOUTH} LMW-3, LMW-5, LMW-8, LMW-9, LMW-11, South Shallow Sentinel Well (yet to be installed), Dual South Sentinel/Cap Effectiveness Well (yet to be installed) will have a monitoring frequency of 5 years for VOCs and TPH; and every 10 years for metals, SVOCs, PCBs, and chlorinated pesticides.

***These frequencies were based on the evaluation of BIOSCREEN modeling, the results of which were summarized by Golder in a report (2009a) and approved by Ecology in their letter dated January 21, 2010.”***

  - ➔ Initial and subsequent monitoring frequencies and locations are partially or wholly ineffectual in protecting public health

- Technologies now exist to enable much higher frequency of monitoring, when leveraging a comprehensive (effective) well count and placement, for any affected wells or groundwater.

## **Brad and Becky Lake**

**From:** B Lake [mailto:lakex3@hotmail.com]

**Sent:** Thursday, December 05, 2013 5:49 PM

**To:** Cruz, Jerome (ECY); Warren, Bob (ECY); Altose, Larry (ECY)

**Cc:** jason.howell@h2observe.com; Bradley Lake

**Subject:** RE: ACTION REQUIRED: Landsburg Mine Site Public Comment Period Extension meeting on 10/24/2013

Dear Mr. Cruz/Department of Ecology,

As local residents who are concerned about the potential for contamination of the groundwater and soils in the area, we are providing comments on your proposed cleanup action plan for the Landsberg Mine. Our requests for additions to the cleanup action plan (CAP) are as follows:

- 1) We ask that the CAP include drilling 1 pumping/sampling well in the center of the waste disposal area to the full depth of the mine (with casing perforations at 10-20 foot intervals), and also include drilling 2 additional wells on the north and south edges of the waste disposal area to the full depth of the mine (with casing perforations at 10-20 foot intervals). This would allow a more thorough characterization of the mine contaminants and their movements, which is an ongoing concern of the residents and businesses in the area.
  
- 2) We ask that the CAP include dewatering the mine down to the very bottom of the trench via the well drilled in the center of the waste disposal area (700+ feet), and that the mine be continuously dewatered for the life of the agreement. This will allow for further investigation of the contaminants which are believed to be in the mine, and cause contaminants to be pulled/flow towards the center of the area believed to have the greatest contamination rather than flowing away from it. The proposed cap of a portion of the mine trench would be more effective if the mine was dewatered via the well at the center of the contaminant area. This dewatering action would also remove the liquid/water that could convey the contaminants to other areas of the mine and also help to prevent the flow of contaminants into the aquifers of the surrounding areas, creating health hazards for the local residents and businesses.

This action would likely create a need for the construction and operation of a waste treatment facility to treat the contaminated waters as they are removed, prior to disposal. This action would address another ongoing concern of the residents and businesses in the area concerning the lack of treatment facilities due to the unknown nature of the contaminants.

- 3) We ask for modification of the assumption that the sidewalls of the trench, being sandstone,

are unlikely pathways for movement of contaminants from the mine. There are crevices and seams in the sandstone layers of the hill surrounding the mine, which convey significant quantities of water. This is evidenced by the existence of several wells in the area capable of producing 25 to 30 gallons per minute from a depth of 300+ feet. Additional monitoring and characterization of any additional/potential contaminant pathways will need to be developed and monitored.

4) We request that scheduled monitoring (or continuous monitoring) of 12 to 15 adjacent drinking water wells on a more frequent basis be scheduled to address the concerns of the neighboring users. This monitoring should be yearly for the life of the agreement, for the suspected contaminants and a suite of priority pollutants, to assure nearby users that their well water is safe for them and their children/families to drink. As you heard in the public forum there is a high level of concern about the uncertainty of the potential pathway and composition of contaminants which may leave the mine.

There has not been enough characterization of the contaminants and exit pathways for contaminants to provide a reasonable level of certainty or protection for the surrounding users of the aquifers, and the proposed CAP does not do enough to address those concerns for protecting public health.

We appreciate you including these requests in the cleanup action plan for the Landsberg Mine.

Brad and Becky Lake/Concerned Residents of the Rock Creek Area  
26031 276th Ave. S.E.  
Ravensdale, Wash. 98051

## Greater Maple Valley Unincorporated Area Council (GMVUAC)

Greater Maple Valley Unincorporated Area Council  
P.O. Box 101  
Maple Valley, WA 98038

December 11, 2013

To: Jerome Cruz  
Washington State Department of Ecology  
3190 160th Ave SE  
Bellevue, WA 98008  
[jerome.cruz@ecy.wa.gov](mailto:jerome.cruz@ecy.wa.gov)

Subject: Landsburg Mine Cleanup Action Plan October 11, 2013, Consent Decree

Mr. Cruz,

We have reviewed the subject Decree and its Exhibits and offer the comments herein. While we find the plan has merit in the short term, there remain several long-term concerns.

Given the history of the site, we remain concerned with the degree of contamination resulting from up to 5,000 drums (~450,000 gal) of toxic waste which were dumped into the partially mined seam, then overfilled with construction debris fill.

Although DOE considers its monitoring wells as “early warning” systems, it has no specific treatment system in place should specific toxic materials be detected. Solely relying on industry-standard methods to cleanup such materials does not constitute a sufficient plan. Monitoring groundwater indefinitely is not the same as a commitment to ensuring eventual public health and safety.

The contingency plan includes groundwater treatment with infrastructure facilities at the north and south portal areas to contain, treat, and dispose of contaminated groundwater should it be detected at the Site. However, DOE and the Potentially Liable Parties (PLPs) are assuming a “bathtub” containment, i.e., nothing should escape the seam and migrate to private wells, the water table, the Cedar River, or Rock Creek.

The long-term liability of the responsible PLPs is questionable. The subject Decree specifies “*indefinite*” funding, which the courts have interpreted as “*temporary*” [*U.S. v. Pieter van den Berg*, 5 F.3d 439 (9th Cir. 1993)]. Because the in-ground contamination is potentially a very long-term problem, such language does not guarantee sufficient cleanup and remedial funding will be there when needed. Consequently, we request the subject Decree expressly address increase in or refunding of the PLP source of such funds (i.e., bond or other guarantee) over time to continue with the long-term effectiveness of the proposed employed measures. In fact, what mechanisms are being put in place to ensure

“replenishment” of funds as they are exhausted? Without such mechanisms and their enforcement, what is the subject Decree buying the State and the Public?

Finally, the lack of specific plans, should monitoring show major leakage of contaminants, leaves the Public without clear recourse.

We request the subject decree be modified to address these issues of concern. Thank you.

Sincerely,

Steve Hiester ([hies\\_skel@hotmail.com](mailto:hies_skel@hotmail.com))  
Chairman, Greater Maple Valley Unincorporated Area Council

cc: King County Executive Dow Constantine: [Dow.Constantine@kingcounty.gov](mailto:Dow.Constantine@kingcounty.gov)  
King County Council: [council@kingcounty.gov](mailto:council@kingcounty.gov); [rod.dembowski@kingcounty.gov](mailto:rod.dembowski@kingcounty.gov);  
[larry.gossett@kingcounty.gov](mailto:larry.gossett@kingcounty.gov); [kathy.lambert@kingcounty.gov](mailto:kathy.lambert@kingcounty.gov);  
[larry.phillips@kingcounty.gov](mailto:larry.phillips@kingcounty.gov); [julia.patterson@kingcounty.gov](mailto:julia.patterson@kingcounty.gov);  
[jane.hague@kingcounty.gov](mailto:jane.hague@kingcounty.gov); [pete.vonreichbauer@kingcounty.gov](mailto:pete.vonreichbauer@kingcounty.gov);  
[joe.mcdermott@kingcounty.gov](mailto:joe.mcdermott@kingcounty.gov); [reagan.dunn@kingcounty.gov](mailto:reagan.dunn@kingcounty.gov)  
King County Executive’s Land-Use Policy Advisor: [Lauren.Smith@kingcounty.gov](mailto:Lauren.Smith@kingcounty.gov)  
King County Community Service Area Manager: [alan.painter@kingcounty.gov](mailto:alan.painter@kingcounty.gov)  
KC/Seattle Public Health: [david.fleming@kingcounty.gov](mailto:david.fleming@kingcounty.gov)  
District 5 State Legislative Representatives: [jay.rodne@leg.wa.gov](mailto:jay.rodne@leg.wa.gov);  
[mark.mullet@leg.wa.gov](mailto:mark.mullet@leg.wa.gov); [chad.magendanz@leg.wa.gov](mailto:chad.magendanz@leg.wa.gov)  
State DOE Public Involvement Coordinator: [nancy.lui@ecy.wa.gov](mailto:nancy.lui@ecy.wa.gov)

# Cedar River Council

## C E D A R R I V E R C O U N C I L

Co-chair, Larry Phillips, King County Council  
Co-chair, Reagan Dunn, King County Council

Staff, Nathan Brown III  
201 South Jackson Street, Suite 600  
Seattle, Washington 98104  
206 263-6181  
206 296-0192 fax



December 5, 2013

Dear Dr. Cruz:

RE: Landsburg Mine Cleanup Action Plan / Consent Decree

Thank you for your presentation to the Cedar River Council, (CRC) on October 22, 2013. This comment letter is on behalf of the Cedar River Council. Our comments are based on your presentation to the CRC, the project administrative record and the public meeting at the Tahoma Middle School on October 24th, 2013.

The CRC is primarily focused on issues surrounding the health of the Cedar River. We also take an interest in issues that could impact the welfare of basin residents. The Cleanup Action Plan, (CAP) is based on substantial information developed over the last two decades and is consistent with Model Toxics Control Act, (MTCA) requirements. This toxics cleanup site is up gradient of two major public resources, the Cedar River and the City of Kent Water System facility at Clark Springs. It is also surrounded by private water supply wells.

The "Cap, Cover and Perimeter Fence Plan," along with surface water diversion on the north end of the mine appears to do no harm and may reduce or slow contaminant transport to groundwater, but the expected results are not certain and these actions alone should not relieve the Potentially Liable Parties, (PLP's) of their long-term responsibilities under MTCA.

Our specific comments are:

1. Water supply wells surrounding the site have only been sampled one time in 1990. The subject "Cleanup Action Plan" is heavily based upon an assumption that there will be no groundwater impacts that will not be seen first at the two portals, the validity of this assumption is by no means proven. Therefore, it seems prudent and protective of human health to repeat this effort at least one time and at the routine five year review cycle. Since the sampling event in 1990 lab procedures and detection limits have improved significantly, health based cleanup levels have dropped and new water supply wells have likely been installed. At the public meeting many nearby neighbors had similar concerns and deserve to benefit from the full protection and peace of mind intended by the Model Toxics Control Act.

2. We urge you to consider requiring continuous monitoring with alarm telemetry at the North and South portal monitoring wells. While current technology may not allow for remote monitoring of some chemicals, simple analyses such as pH, conductivity, and groundwater levels are routinely monitored by remote systems that relay an alarm in the event of an out of range condition. Further, consideration of sensors and telemetry used in industrial and laboratory operations should be considered, given the critical public resources relatively close to the mine discharges. A continuous monitoring system with alarms makes good sense for the public.

3. Five year reviews will be performed at this site. Please include language in the Consent Decree that spells out how adaptive management on maintenance and monitoring requirements will occur during reviews and what the expectation for public involvement for these reviews is.

4. The current contingency plans are inadequate. Please incorporate conceptual level contingency plans, agreed to by all parties in the event contaminants are detected at either portal. Although treatment systems can't be totally designed until the contaminants and concentrations are known, general treatment systems for classes of contaminants such as metals or volatile organics are commonly designed. We are concerned that the length of time required for a large PLP group to take action is not fast enough in the event that changing conditions require remedial action. This comment is largely based on the past project performance. The RI/FS was completed in 1996 and 17 years later we are still contemplating the remedy. In addition please address the following points within the CAP:

- Describe a robust catastrophic event contingency plan, which reckons with the effects of periodic earthquakes, shifts in groundwater tables and major changes in precipitation.
- Clearly demonstrate that the well monitoring plan is sufficiently frequent to preclude contaminants leaking into surrounding public and private drinking water supply systems before additional remedial actions can be completed.
- Include an adaptive management plan to respond to changing conditions.

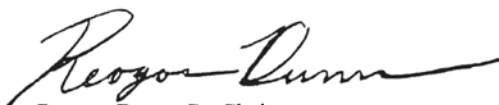
5. The long-term funding requirements for the PLP's are not clear. The plan needs to include a simple substantive financial plan that is understandable to the general public.

The Cedar River Council supports implementation of the "Cap, Cover and Perimeter Fence Plan," along with surface water diversion on the north end of the mine portion of the Landsburg Mine Cleanup Action Plan without further delay, but we also believe that the additional monitoring and contingency plans must be completed to protect the public.

Sincerely,



Larry Phillips, Co-Chair  
Metropolitan King County Council, Dist. 4



Reagan Dunn, Co-Chair  
Metropolitan King County Council, Dist. 8

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The Cedar River Council promotes the health of the Cedar River Basin, focusing on lower basin issues.  
The Council is comprised of basin residents and representatives of community groups, businesses, local, state, federal, and tribal governments.



**PUBLIC WORKS ADMINISTRATION**

Timothy J. LaPorte, P.E.  
Public Works Director  
400 West Gowe  
Kent, WA 98032  
Fax: 253-856-6500

**PHONE: 253-856-5500**

December 12, 2013

**VIA HAND DELIVERY**

Jerome B. Cruz  
Site Manager  
Toxics Cleanup Program  
Northwest Regional Office  
Washington Department of Ecology  
3190 – 160<sup>th</sup> Avenue SE  
Bellevue, Washington 98008

**RE: Landsburg Mine Site - Comments in Opposition to the Proposed Draft Consent Decree, Draft Cleanup Action Plan, and Related Exhibits**

Dear Dr. Cruz:

Enclosed please find for the Washington State Department of Ecology's consideration the City of Kent's Comments in Opposition to the Proposed Draft Consent Decree, Draft Cleanup Action Plan, Draft Compliance Monitoring Plan, and Related Exhibits for the Landsburg Mine Site—both in paper format (two duplicate copies) and in electronic format on disk (two duplicate disks).

As we have indicated in the past, the City of Kent is prepared to meet with Ecology at any time to discuss the Landsburg Mine Site. If such a meeting would assist Ecology in understanding the issues raised in the City's comments, please contact us.

We will appreciate your consideration of the City's comments.

Sincerely,

Timothy Laporte  
Public Works Director

Enclosures—Kent's Comments (two paper copies; two disks)

www.ci.kent.wa.us

● MAYOR SUZETTE COOKE

City of Kent Public Works Department

**City of Kent (complete document in accompanying CD)**

Responsiveness Summary for Cleanup Consent Decree  
Landsburg Mine site – Ravensdale, Washington  
March 23, 2017





**PUBLIC WORKS ADMINISTRATION**

Timothy J. LaPorte, P.E.  
Public Works Director  
400 West Gowe  
Kent, WA 98032  
Fax: 253-856-6500

**PHONE: 253-856-5500**

December 12, 2013

**VIA CERTIFIED MAIL; RETURN RECEIPT REQUESTED**

Washington State Department of Health  
Office of Environmental Health, Safety,  
and Toxicology  
P.O. Box 47825  
Olympia, Washington 98504-7825

**RE: Landsburg Mine Site  
Request for Department of Health Activities**

Dear Sir or Madam:

I write on behalf of the City of Kent ("City") to request that the Washington State Department of Health's Office of Environmental Health, Safety and Toxicology undertake appropriate site investigation, consultation, and reporting actions regarding the Landsburg Mine Site (the "Site") located in Ravensdale, Washington as described in detail below.

The Site is currently the subject of activities under the oversight of the Washington State Department of Ecology ("Ecology") pursuant to Washington's Model Toxics Control Act ("MTCA") because enormous volumes of hazardous wastes historically were dumped into the former coal mine at the Site. Ecology recently sought public comments on a Proposed Draft Consent Decree for the Site, including a Draft Cleanup Action Plan, Draft Compliance Monitoring Plan, and Related Exhibits (the "Proposed Plan").

The City is very concerned about the Site and the Site's threat to nearby water resources. The Site is located immediately north and upgradient of the Rock Creek drainage, a tributary of the Cedar River, and less than one-half mile from the City's primary source of municipal water at Clark Springs. The Site also is just 500 feet south of the Cedar River, and many private wells or small community water supply systems are located in the immediate vicinity of the Site. We understand that the Department of Health has had some involvement with the Site in the past.

www.ci.kent.wa.us

● MAYOR SUZETTE COOKE

City of Kent Public Works Department

Enclosed please find the City of Kent's Comments in Opposition to the Proposed Draft Consent Decree, Draft Cleanup Action Plan, Draft Compliance Monitoring Plan, and Related Exhibits for the Landsburg Mine Site ("Kent's Comments")—both in paper format (two duplicate copies) and in electronic format on disk (two duplicate disks). These materials also have been submitted to Ecology, for Ecology's consideration as part of the MTCA process for the Site. Additional information about the Site and the Proposed Draft Consent Decree can be obtained from Ecology's website (at <https://fortress.wa.gov/ecy/gsp/Sitepage.aspx?csid=60>) and from Ecology's Site Manager (Jerome Cruz, 425-649-7094).

Pursuant to the role and responsibilities of the Office of Environmental Health, Safety and Toxicology, the City requests that the Department of Health consider the Proposed Plan, consider Kent's Comments, and engage in the following activities: (1) engage in a health consultation with the Agency for Toxic Substance and Disease Registry ("ATSDR") to review the Proposed Plan to determine if the Proposed Plan is sufficient to prevent or sufficiently mitigate the exposure to, or threat of exposure to, hazardous substances (including a leak or discharge of chemical or hazardous materials) that may pose a risk to public health and safety, and the compromise of vital water resources (including but not limited to the City's municipal water supply source and water system); (2) conduct a Site investigation of a threat of exposure to hazardous substances (including a leak or discharge of chemical or hazardous materials) that may pose a risk to public health and safety, and the compromise of vital water resources (including but not limited to the City's municipal water supply source and water system); (3) formally communicate in writing to Ecology the results of the Department of Health activities described above in items #1 and #2, for Ecology's consideration in the MTCA process for the Site; and (4) provide the results of these Department of Health activities to the City.

We will appreciate your efforts regarding this matter and look forward to your timely response.

Sincerely,



Timothy Laporte  
Public Works Director

Enclosure—Kent's Comments (two paper copies; two disks)  
cc: Jerome Cruz, Washington State Department of Ecology

## Appendix B. Letter from Ecology Extending Comment Period



STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

Northwest Regional Office • 3190 160th Ave SE • Bellevue, WA 98008-5452 • 425-649-7000  
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

October 16, 2013

Mr. Timothy LaPorte  
Public Works Director  
City of Kent Public Works  
400 West Gowe  
Kent, WA 98032

**Re: Landsburg Mine Site – Request to Extend Public Comment Period**

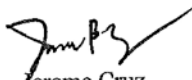
Dear Mr. LaPorte:

This is in response to your letter of October 9, 2013, to Robert Warren, Section Manager, Department of Ecology's (Ecology) Toxics Cleanup Program Northwest Regional Office, wherein on behalf of the City of Kent, you requested for a thirty (30) day extension to the public comment period for the Landsburg Mine Site. The comment period is originally scheduled to end on November 12, 2013.

Ecology will extend the comment period for the requested amount of time. Ecology will end the comment period for the cleanup consent decree on December 12, 2013.

Please do not hesitate to contact me if you have further questions. My telephone number is (425) 649-7094. My email address is [jcru461@ecy.wa.gov](mailto:jcru461@ecy.wa.gov).

Sincerely,

  
Jerome Cruz  
Site Manager

cc: Dori Jaffe, AAG, Ecology Division  
Robert Warren, Ecology



[\[Back to Table of Contents\]](#)

**Appendix C. Golder Associates Responses to City of Kent Attachment F  
(Aspect Consulting's Comments to Proposed Plan)**



## TECHNICAL MEMORANDUM

**Date:** March 21, 2017  
**To:** Jerome Cruz, Ecology Site Manager  
**From:** Douglas Morell, PhD, L.H.G.  
**cc:** Landsburg Mine Site PLP Group  
**RE:** **Golder Associates Responses to Aspect Consulting Memorandum dated December 11, 2013**

**Project No.:** 923-1000-002.R154  
**Company:** Washington Department of Ecology  
**Email:** dmorell@golder.com

At Ecology's request, and on behalf of the Landsburg Mine Site PLP Group, Golder Associates Inc. (Golder) submits the following responses to comments on the proposed Consent Decree and Cleanup Action Plan for the Landsburg Mine Site submitted on behalf of the City of Kent by Aspect Consulting dated December 11, 2013.

### 1.0 GENERAL COMMENTS (GC)

- A. The Remedy Must Include The Ability To Respond Immediately With An Installed, Tested, And Robust Groundwater Containment System If Contaminated Groundwater Threatens To Migrate From The Site. The Proposed Plan Must Be Revised To Define Timelines And Deadlines For Ecology's Oversight and Enforcement Activities.<sup>1</sup>

**Response:** A number of the City's comments relate to concerns about the time required to design, obtain Ecology approval for, permit, construct and optimize operation of the Contingent Groundwater Extraction and Treatment System in the event that contaminant migration from the mine workings were to occur. In 2009, treatment system infrastructure components that required long lead times were identified, were designed, and were constructed as an Interim Remedial Action to shorten the time needed to implement the entire system if needed.

We believe that the timelines in the Draft Cleanup Action Plan (DCAP) for taking necessary additional actions to bring the Contingent Groundwater Extraction and Treatment System on line were reasonable and sufficiently protective of human health and the environment. Nevertheless, in consultation with Ecology, we will include a number of changes to the Final CAP (FCAP) to accelerate the time frame for initiating various actions. These changes will increase the amount of time available for system review, permitting and construction, thereby increasing the protectiveness of the remedy. They will also result in earlier operation of the system to prevent exceedance of MTCA cleanup levels at the compliance wells. Finally, we propose including an enforceable deadline for submittal of an Engineering and Design Report (EDR) for the Contingent Groundwater Extraction and Treatment System. The EDR will include deadlines for subsequent activities relating to system review, permitting, and, as appropriate, installation, operation and optimization. Once approved by Ecology, the EDR, including its deadlines, will become an enforceable part of the CAP and Consent Decree. Exhibit D, Part C of the FCAP, has also been revised to describe the optimization testing that would be conducted if the system ever required activation.

The revised triggers and schedules for implementation of the Contingent Groundwater Extraction and Treatment System, should it become necessary, are summarized in Table 1 below, and are discussed more fully in Ecology's response to City of Kent comment (Responsiveness Summary [RS] Section Y.5, Concerns on Contingency Plan). The FCAP will also be revised as requested by Aspect Consulting to require

<sup>1</sup> In the general comment section, each comment heading is taken verbatim from Aspect's comments.  
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continued operation of the system until levels at the compliance wells and pumping well remain below 0.5 MTCA for four consecutive monitoring periods or a minimum of 1 year.

**Table 1: Summary of revised triggers and schedules for contingent groundwater extraction and treatment system activities in response to public comments**

Activity	Draft CAP Trigger / Schedule	Final CAP Trigger / Schedule
Increase monitoring frequency and conduct an Alternative Source Evaluation.	Begins when confirmed <u>compliance</u> well sample results are >0.25 MTCA	Begins when confirmed <u>sentinel</u> well sample results are > 0.25 MTCA
Submit contingent groundwater extraction and treatment system Engineering and Design Report (EDR), including schedule for all subsequent activities (e.g., review and permitting, construction and operation)	<u>Approximately</u> 30 days after confirmed <u>compliance</u> well sample results are > 0.5 MTCA	<u>No later than</u> [30] days after confirmed <u>sentinel</u> well sample results are > 0.5 MTCA
Ecology review and permitting of system	According to schedule in Ecology-approved EDR	According to schedule in Ecology-approved EDR (estimated 2 to 4 weeks)
Construct system	When confirmed <u>compliance</u> well sample results are > <u>0.5</u> MTCA and according to schedule in Ecology-approved EDR	When confirmed <u>sentinel</u> well sample results are > <u>1.0</u> MTCA and according to schedule in Ecology-approved EDR (estimated 2 to 4 weeks)
Begin operation of system	When confirmed compliance well sample results are > <u>1.0</u> MTCA and according to schedule in Ecology-approved EDR	When confirmed compliance well sample results are > <u>0.5</u> MTCA and according to schedule in Ecology-approved EDR (estimated 2 weeks)
Stop operation of system	When compliance well sample results are < <u>1.0</u> MTCA for four consecutive monitoring periods or a minimum of 1 year	When compliance wells and pumping well sample results are < <u>0.5</u> MTCA for four consecutive monitoring periods or a minimum of 1 year

(changed parameters are underlined)

Note: Iron, manganese, and arsenic are analytes associated with the coal mine water and monitored levels are not associated with Landsburg Mine Waste and will not be used as a trigger, unless a significant increase in concentrations occur and an alternative source is not identified.

**B. The Remedy Must Define Enforceable Deadlines for the Contingent Groundwater Containment System's Installation, Operation, and Achievement of Hydraulic Containment.**

**Response:** As described in response to Aspect General Comment #GC-A and presented in Table 1 above, the FCAP will be revised to include enforceable deadlines for the design, review, permitting, and, as appropriate, installation, operation and optimization of the Contingent Groundwater Extraction and Treatment System.

**C. The Proposed Plan's "Trigger" For Initiating Operation Of The Contingent Groundwater Containment System Is Not Sufficiently Protective Because The Proposed Plan Could Allow Contaminated Groundwater To Migrate From The Site And Degrade Adjacent Water Resources.**

**Response:** As described in response to Aspect General Comment #GC-A above, the FCAP will be revised to accelerate the time at which operation and optimization of the Contingent Groundwater Extraction and Treatment System would begin in order to prevent exceedances of MTCA cleanup levels at the compliance wells. The revised trigger for operation of the system will be the trigger that Aspect Consulting requested (0.5 MTCA cleanup levels at wells near the portals – i.e., at the compliance wells). Please also see Ecology's response to City of Kent Comment (RS Section Y.5, Concerns on Contingency Plan).

D. The Remedy Must Include Defined And Enforceable Hydraulic Performance Standards For Achieving Groundwater Containmentment.

**Response:** The most effective performance standards are the MTCA CULs and conditional point of compliance upon which the FCAP is based. The Contingent Groundwater Extraction and Treatment System, if necessary, will be designed to prevent groundwater above MTCA CULs from leaving the Site. The EDR will include appropriate performance criteria including: installing and monitoring of extraction performance wells, as needed, and groundwater quality monitoring from sentinel and compliance wells. Any groundwater extraction system tested and designed before construction of the remedial cap and surface water diversion would need to be revised for the change in groundwater recharge and flow resulting from the cap. Monitoring wells for the extraction system, including existing compliance and sentinel wells, and any necessary additional performance wells as determined in the EDR, will be used to monitor hydraulic performance if the extraction system becomes operational. Although it is implicit in the DCAP, the Contingent Groundwater Extraction and Treatment Plan (Exhibit D – Part C) included with the FCAP will explicitly state that additional performance wells will be added, as necessary, to ensure effective monitoring of hydraulic performance.

E. The Proposed Plan Anticipates That Monitoring, Maintenance, And Institutional Controls Will Terminate In The Future, Contrary To Many Past Promises Made By Ecology And The PLP Group. For This Site, MTCA Requires Monitoring, Maintenance, And Institutional Controls In Perpetuity.

**Response:** As discussed in Ecology's responses to the City of Kent Comments (RS Section T.2, Provision for Termination of O&M and Institutional Controls), the remedy, including monitoring, maintenance, and institutional controls, will continue unless and until residual wastes are remediated using new, currently unavailable technologies to below applicable MTCA levels. Any such change to the remedy would require either an amendment to the Consent Decree or a new Consent Decree, both of which would require Ecology approval and trigger additional opportunities for public review and comment. The referenced language does not signal a shift in the long-term strategy for the Site.

F. The Remedy Must Include More Protective Monitoring Frequencies.

**Response:** As discussed in Ecology's response to City of Kent (RS Sections J.1 and J.2, Protectiveness of Long Term Monitoring Frequency, Golder conducted the BIOSCREEN modeling with input from Aspect Consulting. Ecology selected the most conservative input parameters from those submitted by Golder and Aspect to determine appropriate monitoring frequency. Accordingly, the monitoring frequencies in the DCAP are appropriate and protective. Nevertheless, the FCAP will be revised to increase the frequency of monitoring at the South sentinel and compliance wells to once every 5 years for all analytes, in part to support more robust 5-year reviews by Ecology.

G. The Proposed Plan Undermines The "Black Box Approach" By Relying Upon Speculation And Unproven Assumptions.

**Response:** The comment is a generalized criticism of the Remedial Investigation/Feasibility Study (RI/FS) and the selected cleanup alternative and approach taken for the Site. The comment largely restates issues raised and addressed elsewhere in responses to Aspect's comments, including, specifically, responses to Aspect Comments #GC-A, -D, -E and -F, which are provided above.

H. If the "Black Box Approach" Is To Be Used For Remedy Selection, MTCA Requires More Conservative (Protective) Remedy Components Than Those Provided By The Proposed Plan.

**Response:** The comment identifies four recommended changes to the DCAP that Aspect asserts would make the remedy more conservative (protective). Golder's response to each numbered recommendation is given below:

1. Sludge Removal Recommendation: As discussed in Ecology's response to City of Kent comment (RS, Section G.2, Covering Wastes [Containment Remedy]), there is no incrementally higher benefit under existing conditions to remove sludge compared to containing it under clean fill.
2. Additional Monitoring Wells: Hydraulic monitoring will be conducted during trench backfilling. The FCAP plans to install a combination sentinel / hydraulic monitoring well just south of the southernmost backfilled trench. The existing monitoring wells LMW-1 and LMW-1A located on the rock bridge will be used for hydraulic monitoring during trench backfilling. The proposed array of hydraulic monitoring wells for trench backfilling will provide useful data on the effects of trench backfill to groundwater levels. There is no need to add other new wells for this purpose. Please also see Ecology response to City of Kent comment (RS, Section K, Monitoring Well Installation for Cap Performance Monitoring).
3. Immediate Earthquake Response: Ecology and the PLP Group first recognized the potential risk from earthquakes in earlier drafts of the Consent Decree. For this reason, the CAP calls for inspection of the site after an intensity IV or greater earthquake (see section 5.5.5.3 of the FCAP, and section 1.5 in Part B Operation and Maintenance Plan, Exhibit D of the Consent Decree). Section 5.5.5.3 of the DCAP states:

"Ecology will be notified of site conditions within seven (7) days and a decision will be made between the property owner and Ecology on taking groundwater samples from site wells in accordance with the sampling network, protocols, and analytical methods of the Compliance Monitoring Plan in the Consent Decree (Exhibit D)."

In order to arrive at the decision to sample wells, site wells will have to be inspected for damage as part of the post-earthquake site inspection. Additional monitoring will be based on the decision by Ecology and property owner once the results of the inspection are reported. If warranted, Ecology may require additional investigations be conducted to assess changes caused by the earthquake. We do not agree that "triggers" other than occurrence of an intensity IV earthquake should be defined nor that more specific monitoring or investigation requirements be identified in the CAP because earthquake affects cannot be defined before occurrence.

4. Increased Financial Assurance: As discussed in Ecology's response to City of Kent comment (RS, Section R, Concerns about Financial Assurance), the Financial Assurances requirements of the Consent Decree are adequate, consistent with MTCA, and allow Ecology to require additional financial assurances if determined necessary during the annual review process.
- I. The Proposed Plan to Leave Chlorinated Solvents Sludge ("Free Product") In Place at the Surface Violates MTCA's Requirements. The Sludge Must Be Removed From the Trench Surface.

**Response:** Please see response to Aspect Comment #GC-H.1 above and review Ecology's response to City of Kent comment (RS, Section G.2, Covering Wastes (Containment Remedy)).

- J. Other Deficiencies of The Proposed Plan Are Discussed In The "Specific Comments" Below.

**Response:** This is a generalized comment about uncertainties at the site relative to the planned cleanup. Specific comments are repeated elsewhere in Aspect's comments and are addressed below. All MTCA and CERCLA sites have uncertainties. In fact The U.S. Environmental Protection Agency (EPA/540/G-89/004 OSWER Directive 9355.3-01) states: "The objective of the RI/FS process is not the unobtainable goal of removing all uncertainty, but rather to gather information sufficient to support an informed risk management decision regarding which remedy appears to be most appropriate for a given site." MTCA (WAC 173-340-350(1)) states: "The purpose of a RI/FS is to collect, develop, and evaluate sufficient



information regarding a site to select a cleanup action.” Both the Federal and State agencies recognize that all uncertainties do not need to be removed in an RI. The proposed remedial action has not changed materially from the initial 1996 RI/FS even after additional investigations have been conducted, mainly in response to the City of Kent recommendations when deemed technically appropriate.

- K. The Proposed Consent Decree’s Financial Assurance Cost Estimate Violates WAC 173-340-440(11)’s Requirement to Require Financial Assurance Mechanisms to Cover All Costs Associated With the Operation And Maintenance Of The Remedial Action, Including Corrective Measures.

**Response:** Please see response to Aspect Comment #GC-H 4 above and review Ecology’s response to City of Kent comment (RS, Section R, Concerns about Financial Assurance).

We will respond to the following specific comments from Aspect where and to the extent they include comments or issues different from any of Aspect Comments #GC-A through -K.

## 2.0 SPECIFIC COMMENTS:

1. The RI/FS did not misrepresent source characterization. Section 3.2 of the 1996 RI/FS identifies the activities that were completed and the use of data available from previous investigations and interim removal actions. Section 2.2 of the DCAP describes source sampling as “limited.”
2. We will remove the word “unlikely” from the sentence.
3. Because groundwater discharges from both the south and north portal areas from the mine, there must be a divide within the permeable mine workings. The data indicate that the divide is very near the south end of the mine based on groundwater elevations (hydraulic heads) in P-2, LMW-3, LMW-5, LMW-9, and LMW-11. Review of the monitored elevation heads in these southern wells during interim groundwater monitoring indicates that the groundwater elevations are very nearly the same within the southern 600 feet of the overall 4,200 foot long Roger Coal Mine. Furthermore, the waste disposal area is more than 2,200 feet north of this southern 600 feet section of the mine wherein the groundwater divide resides. Groundwater flows from locations having higher groundwater elevations toward locations with lower groundwater elevations. The portal discharge at the southern end of the mine is at an elevation of about 642 feet (LMW-8) while the waste disposal trench discharge elevation at the north tunnel in the rock bridge (LMW-1) averages about 625 feet elevation, or almost 20 feet lower. The monitored groundwater elevations show groundwater flows specifically within the southern 600 feet of the mine (represented by LMW-3, LMW-5, LMW-9, and LMW-11) toward the north at times and at other times toward the south. During some monitoring events, there is no measureable difference in groundwater elevations within the mine’s southern wells and; therefore, at such monitoring events, no discernable groundwater flow is occurring between the well locations within the southern 600 feet. This data indicate that in the southern 600 foot portion of the mine, groundwater flow changes direction from being northerly to being southerly with very little measureable difference in elevation over a distance of greater than 600 feet. This data define the groundwater divide to be within the southern portion of the mine workings where seasonal recharge changes to the mine workings shift the groundwater divide and causes a change in groundwater flow direction at the southern end of the mine where the divide exists. Groundwater underneath the disposed waste in the north portions of the mine is flowing northerly and not influenced by slight seasonal shifts in the groundwater divide in the south end of the mine.

Although the groundwater divide is in the southern portion of the mine, the FCAP, like the DCAP, assumes a conservative position that the divide may be under the waste disposal area and groundwater under the northern trenches may be able to migrate to the south portal. If the divide is always located south of waste disposal trenches, there would be no reason to monitor and sample the south portal monitoring wells in the future. The installation of the combination sentinel/cap performance monitoring well located just south of the capped trenches should provide information that helps further define and confirm the location of the groundwater divide in the mine.

4. This comment makes a judgment statement. We believe that the proposed remedy, including the revisions discussed in response to Aspect Comment #GC A above, is sufficiently protective and addresses uncertainties at the Site. Many MTCA sites and most MTCA landfill sites have containment as the remedy with long-term compliance monitoring, contingencies, and institutional controls. The proposed remedy is consistent with MTCA.
5. The term “infrastructure components” was used early in the proposed Interim Measures to Ecology and the public to define components of the Contingent Groundwater Extraction and Treatment System that potentially have long-lead times to obtain approvals and to install. This included: electrical connections, access roadway and parking, security fencing, area lighting, and the effluent discharge pipeline (extended to private property boundary). The interim action was proposed and a SEPA Checklist for the project was submitted to Ecology (Golder November 2005 and September 2005, respectively). The proposed infrastructure project was approved by Ecology (Ecology March 20, 2006 signed SEPA DNS; and Ecology May 30, 2006 Approval for the installation of North Infrastructure Components). The term “infrastructure components” was never intended to, or presented to the public in a manner that might, represent the entire Groundwater Extraction and Treatment System. The pipeline will not be connected to the Metro sanitary sewer until needed and a request for connection is made to King County. Temporary trucking to Four-Corners has always been planned until the discharge line can be connected. Issues regarding Soos Creek and Tahoma School expansions have been addressed. The sanitary sewer line has enough capacity to handle the combined flows (Tahoma School and the Landsburg Mine Site), and discharge from the Landsburg Site system could be done during periods without students present. Additional information of the Contingent Groundwater Extraction and Treatment System will be provided in Exhibit D – Part C that defines the necessary steps for system installation, shows the system components, pumping and potential extraction and performance well locations, and the discharge pipeline connection to Soos Creek sanitary sewer system. Engineering details and designs will be submitted in the EDR for the system within 30 days after the appropriate trigger is confirmed.
6. Please see Ecology’s response to City of Kent Comment (RS Section Y.5, Concerns on Contingency Plan) and responses to Aspect Comment #GC-A, -B, and -C.
7. Please see Ecology’s response to City of Kent Comment (RS Section Y.5, Concerns on Contingency Plan) and responses to Aspect Comment #GC-A.
8. This was addressed previously in responses to Aspect Comment #SC-1 and City of Kent Comment (RS Section E.1, Site Characterization and Investigation).
9. The comments are criticizing the CAP for providing reasonable interpretations of known information. It is appropriate for the RI/FS and CAP to report this known information and to provide reasonable interpretations in the context of other information. Please see Ecology’s response to City of Kent Comment (RS Section E.1, Site Characterization and Investigation). Previous investigations (1990 Soils Gas Survey by Geotechnology; 1991 SHA by Ecology; Interim Drum Removals by the PLPs), the RI investigations, and additional hydrogeologic investigations in the southern portion of the mine indicate that wastes were disposed within the northern trenches, that some of the wastes were in drums, and that there were multiple large historical fires in the waste area.
10. Please see Ecology’s response to the City of Kent Comment (RS Section X, Factors such as earthquakes that potentially cause contaminant movement). The possibility of an earthquake is considered and addressed in the CAP.
11. Here, Aspect is again criticizing the CAP for providing reasonable interpretations of known information. As described below, the hydrogeologic conceptual model for the Rogers Mine summarized in Section 3.3.2 is based on sound information from mining records, site-specific investigations, and accepted hydrogeologic principles.

The mine records, based on actual observations underground and developed to address miner safety issues, are key to our understanding of the hydrogeology at the Site. To address miner safety, the three items that are always keenly observed and documented in underground mines are: (1) signs of instability; (2) evidence of water inflow; and (3) air quality and the adequacy of ventilation. Miner observations and mine records are not speculative and in fact provide much information that is useful in developing a Site conceptual model (for example, a road cut provides much more information on the geology along the cut than a few boreholes). Since four miners were killed at the Landsburg seam coal mine due to water intrusion just 4 years before the mining on the Rogers seam commenced, water intrusion would be expected to be closely observed and documented, and it was. In fact, faults and fractures when encountered during mining in the mine were identified in mine records along with groundwater inflow observations. Consistently, the encountered faults / fractures had no or very little groundwater inflow when encountered during active mining. Rogers mine records also indicate that the most likely groundwater inflow (when the mine was completely dewatered) was approximately 40 gallons per minute (gpm) during the wet season and pumped much less during the dryer season. The pumps used to dewater the mine were documented in the mine records and have known maximum pumping rates, which were also used to estimate groundwater withdrawals (SubTerra 2005). Those records are representative of the estimated withdrawal rates as reported in the RI/FS.

During periods that the sump pumps were being maintained or repaired, the resulting groundwater level in the mine was recorded and used to estimate the mine recharge for the period of sump pump downtime. The groundwater inflow to the entire mine (at a dewatered stage that maximizes inflow gradients) was consistent with a recharge to the entire mine of 40 gpm. These records also support conclusions regarding the total amount of groundwater recharge in mine workings and are provided in the Landsburg Mine-Coal Mine Hazard Assessment (SubTerra 2005).

In addition to underground mining observations, there are other methods to estimate the amount of water recharging to and discharging from the Rogers Mine. Mass water balances (total precipitation) along the mine Site indicate that a total precipitation of about 50 gpm occurs during an average year within a footprint 200 feet wide along the 4200 feet length of the mine. This simple calculation assumes all precipitation (~50 inches/year) recharges the mine including within 100 feet east and west of the mine. This is an upper bounding estimate, since evaporation, transpiration, sublimation, and runoff or interflow away from the Rogers mine are not discounted from the estimate. This total Site precipitation rate of about 50 inches per year supports the estimated mine groundwater recharging and discharging rates presented in the 1996 RI/FS, the CAP, and the Landsburg Mine-Coal Mine Hazard Assessment (SubTerra 2005). The total average discharge from the mine cannot be greater than the amount of recharge the mine receives. To extract groundwater from the Rogers Mine at a portal at our estimated 40 gpm is anticipated to stop discharge from either portal area and contain the contaminant plume quickly due to the transmissive nature of the mine workings and due to the geologic geometry and groundwater hydraulic boundaries existing in the mine. The amount may be sufficient to eventually drain the mine of groundwater (especially after the added remedy protection of low permeability cap and surface water diversions is implemented). This Site does not require initial studies to determine pumping rates for hydraulic containment. Initial pumping rates should be about 40 gpm after the low permeability cap is installed with surface water diversions and can be optimized (minimal needed for maintaining containment) during its operation. However, the extraction wells to be installed will be capable of extracting significantly higher volumes if it should become necessary to do so.

The Rogers Mine appears to be a groundwater sink to adjacent bedrock groundwater. During the Drilling of LMW-11 borehole penetrated the adjacent silt/sandstone beds to the west of the mine workings to a depth of about 690 feet before reaching the Rogers mine workings. The initial saturated groundwater in the bedrock was encountered at an elevation above the water table in the mine workings. At the beginning of each drill day, water levels were measured in LMW-11 as the borehole progressed deeper. The water levels in the bedrock borehole keep declining and approached the water table in the mine workings. Once the mine workings were penetrated, the water level became essentially the same as in the mine workings at LMW-9. Although this was only a short period of time at one location, it is a strong indicator that bedrock to the west of the mine discharges groundwater to

the mine workings, rather than vice-versa; and therefore, is not a groundwater pathway from the mine. This hydrogeologic model is very typical with underground rock mines having portal discharges.

A basic hydrogeologic concept for sedimentary bedrock is that the hydraulic conductivity (K) is anisotropic to the bedding planes. In the direction parallel to bedding planes, the effective K will be similar to the beds having the highest K values, while the effective K perpendicular to the bedding planes will be similar to the beds having the lowest K value (Freeze and Cherry 1979, page 33). Low-grade shale beds are well documented to exist in the Puget Group and at the Landsburg Mine site and were verified by inspecting surface geology, trenching along the mine rim, and RI borings. These shale beds impede groundwater flow perpendicular to the bedding planes. This hydrogeologic model is supported by the mine records that document mine fractures and faults not yielding significant quantities of groundwater even with the mine dewatered which maximizes the hydraulic gradient from the bedrock to the mine workings. Because the adjacent bedrock has very low hydraulic conductivity perpendicular to cross bedding and has groundwater at higher heads than the groundwater in the Rogers mine workings, contaminated groundwater in the mine cannot migrate laterally to the west through bedrock. This hydrogeologic conceptual model for the Rogers mine is based on sound information in mining records, conducted investigations, and sound hydrogeologic principles.

Again, the hydrogeologic conceptual model for the Rogers mine is well supported by direct observational evidence, Site-specific investigation results, and accepted hydrogeologic principals. For added protectiveness, however, the proposed cleanup action conservatively provides for potential lateral migration of Rogers mine contaminants through the bedrock by institutionally controlling groundwater withdrawal and use between the Frasier and Landsburg coal mines and the Rogers mine. Compliance wells are also placed in each adjacent mine to monitor groundwater quality. The Frasier and the Landsburg mines are hydrologic sinks (barriers for Rogers contaminated groundwater to flow through and further west and east of the Frasier and Landsburg mines, respectively) for local bedrock groundwater with portals controlling groundwater levels in these mines. The CAP conservatively proposes to prohibit groundwater withdrawal and use (groundwater protection area) between the Frasier and Landsburg Coal Mine workings as added protective measures, because as previously mentioned, the bedrock adjacent to the Rogers mine is discharging groundwater into the Rogers mine, not vice-versa.

12. The groundwater divide was addressed previously in responses to Aspect Comment #SC-3. We will remove the word "slight" from the suggested sentence.
13. The comment did not identify any specific "speculative statements" or "unproven assumptions" and therefore, cannot be addressed. Mine stability was evaluated during the RI/FS and in the Landsburg Mine – Coal Mine Hazard Assessment (SubTerra 2005). The RI/FS and CAP are consistent with these evaluations.
14. Aspect takes issue with what it incorrectly perceives to be an inconsistency in assumptions underlying the Proposed Plan: "... the overall volume of remaining voids was estimated to be less than 10 percent. This total porosity is significantly less than the effective porosity assumed for the BIOSCREEN model analysis,....." In mine stability assessments, "voids" refer to actual remaining voids that have not been filled by soil or rock during mining. The void space may be very large (i.e., if a slab of high wall rock collapsed and bridged the underlying mine workings that prevented in-filling with soil, or from uncollapsed tunnels). It represents the potential volume of future subsidence that could occur. This differs from soil or rock matrix "porosity," which instead describes the interstitial space between soil grains or within the rock matrix, which is supported by solid grains in contact with each other and which are not subject to collapse.
15. We will change the referenced paragraph to clearly state no contamination has been detected emanating from the mine.
16. RI sampling and analysis outside the waste disposal trenches were conducted along the top surface of the trenches where waste disposal activities were concentrated and in near surface soils surrounding

the north and south portals. This sampling protocol was intentionally focused on areas outside the trenches where contamination most likely may be present, and one location was selected for soil sampling that was considered to represent background. Contamination was not detected in the areas. We feel that sufficient sampling was conducted given the absence of any contaminant detections in the areas that were most likely to be contaminated. There is no reason to suspect contamination in areas that had no truck access or evidence of waste disposal other than the locations sampled.

17. We will change the reference to MTCA Method B to applicable MTCA CULs.
18. Please see Ecology's response to City of Kent Comment (RS Section E.1, Site Characterization and Investigation).
19. The referenced sentence is well supported but we will change the final referenced sentence to qualify its conclusion as based "current known conditions."
20. We will change the referenced sentence as suggested.
21. The figures identify Kent's watershed. No change is needed.
22. We will identify Kent's Clark Springs well as a large municipal supply well and the Bridle trails wells as local community wells. We do not believe that adding additional private wells is needed for the CAP since they are outside of the Landsburg Site groundwater protection area.
23. We will add the referenced sentence as suggested.
24. We will add the referenced sentence as suggested.
25. We will revise the referenced paragraph to state: "No contaminants attributable to wastes disposed of in the trenches were identified in any groundwater, surface water, or air samples collected during the RI/FS or in groundwater samples collected since completion of the RI/FS."
26. In developing MTCA CULs for groundwater at the Site, we have taken into consideration the protection of surface water beneficial uses in the Cedar River and Rock Creek. However, at this Site, we do not agree that triggers in the sentinel and compliance wells be set at MTCA CULs for surface waters. The Cedar River and Rock Creek are hundreds of feet from the Site compliance boundaries and the applicable point of compliance for surface waters is immediately before groundwater discharges to the surface water body. Detection limits in the Quality Assurance Project Plan (QAPP) are sufficient to detect contaminants in sentinel and compliance wells that may pose a potential future risk to surface waters hundreds of feet away.
27. Ecology approved the conditional point of compliance for this Site based on practicability. It is impractical, probably impossible, and too dangerous to remove all waste from the Site relative to the environmental benefit obtained (see FCAP, Section 5.3.2). Typical closure or cleanup actions at landfills are containment in place with a conditional point of compliance with further protection provided by institutional controls. The entire conditional point of compliance boundaries are within property owned by PCC.
28. The restoration time frame for the Proposed Plan is appropriate for a containment remedy.
29. Please see Ecology's response to Comment (RS, Section G.2, Covering Wastes (Containment Remedy)).
30. Please review Ecology's responses to the City of Kent Comments (RS Section T.2, Provision for Termination of O&M and Institutional Controls).

31. Please see Ecology's response to City of Kent Comment (RS Section E.1, Site Characterization and Investigation) and response to Aspect Comment #SC-9. The referenced section will be revised to reflect that contamination has not been detected in groundwater emanating from the mine. The groundwater in the southern portion of the mine has been investigated; contamination has not been detected in groundwater in the southern portion of the mine.
32. Please see response to Aspect Comment #SC-3.
33. Although the Engineering Design Report has not been started, we expect that tree removals in the trench would be initially cut by personnel using protective gear, such as a harness connected to the top of the trench. The tree could be removed from the top of the trench by cable hoists. We do not anticipate removing any grasses or scrubs from the trench. This is not comparable to any conceivable approach to removing chlorinated solvent sludge from Area 2.
34. Please see Ecology's response to City of Kent Comment (RS Section Y.5, Concerns on Contingency Plan) and responses to Aspect Comments #GC-A, -B, -C, -D, and -F and to Aspect Comment #SC-11.
35. Please see response to Aspect Comment #SC-15. The statement is true that "groundwater currently meets cleanup levels" at the designated points of compliance. We will clarify and add the suggested "Based upon available data" phrase to the beginning of the sentence and add "at the designated points of compliance" to the end of the referenced sentence.
36. Please see Ecology's response to City of Kent Comments (RS Section T.2, Provision for Termination of O&M and Institutional Controls).
37. We do not anticipate that a temporary pipeline will be necessary to connect the south portal extraction system to the north portal system. The south portal permanent pipeline can be installed in three to four months and sufficient time between initial triggers and operation of the system exists at the south portal to install the permanent pipeline. A temporary pipeline is only one possible contingency measure. Another option would be to use temporary baker tanks that would be trucked for disposal.
38. Ecology has reviewed and approved the RI/FS. After review of the RI/FS and subsequent investigations, Ecology has selected a containment remedial action and determined that a conditional point of compliance is appropriate for the Site as described in the FCAP.
39. Please see responses to Aspect Comment #GC-H and to Ecology's response to City of Kent Comment (RS, Section K, Monitoring Well Installation for Cap Performance Monitoring).
40. We will provide more details on the locations and screened intervals for the north sentinel wells in Exhibit D – Part C. The historic and current monitoring data has shown that contaminants have not been missed nor migrated off-Site. Speculation on Portal #2 controlling groundwater when the mine workings have collapsed as evidenced by the subsidence trench is not creditable. Compliance wells at the north portal monitor the mined coal seam (gravel backfilled) that extends north of LMW-2 and LMW-4 from the mine north portal. The north compliance wells monitor groundwater at a shallow depth and at depths of approximately the elevation of the second-level and third-level gangways that represent possible pathways in the event that mine collapse was not complete. Compliance wells at the south portal are monitoring near surface groundwater from the mine, and groundwater at the second-level and fourth-level gangways in addition to monitoring groundwater emanating from Portal #3 that is connected to incline for the #3 and #4 gangways. Please see Ecology response to the City of Kent Comment (RS, Section L, New Monitoring Well Design and Placement).
41. We will revise the referenced sentence as requested.
42. The referenced section only provides the purpose of protective monitoring. We will refer to the Compliance Monitoring Plan (CMP) for details in the referenced FCAP section.

43. We will add the reference to the EDR to the referenced section.
44. Please see Ecology's responses to City of Kent Comments (RS Section T.2, Provision for Termination of O&M and Institutional Controls and Section S, "In Perpetuity" vs. "Indefinitely").
45. Please see Ecology's response to City of Kent Comment (RS Section X, Factors such as earthquakes that potentially cause contaminant movement).
46. a) Please see response to Aspect Comment #SC-35.
- b) In response to DOH recommendations, sentinel wells will be installed before the start of construction activities.
47. a) "Release" refers to a release from the mine.
- b) We do not share the belief that it is confusing, but we will revise the section for clarity and refer to specific CMP sections.
- c) We will mention that four new sentinel wells will be added to compliance monitoring. During compliance we do not agree that additional monitoring wells other than the four proposed sentinel wells are needed for compliance monitoring.
- d) i) We do not agree that additional monitoring wells need to be added to the proposed system for protection monitoring. Please see Ecology's response to the City of Kent Comment (RS, Section K, Monitoring Well Installation for Cap Performance Monitoring) and response to Aspect Comment #SC-63.
- d) ii) We will revise the referenced sentence to say analysis for the VOCs, but we are screening for TPH using NWTPH-HCID.
- d) iii) Please see Ecology comments to City of Kent Comment (RS, Section M, Omission of 1,4-Dioxane from Analytical Suite).
- d) iv) We agree that it is appropriate to drop PCBs from the monitoring program, subject to Ecology's approval.
- e) We proposed to use NWTPH-HCID for screening petroleum hydrocarbons. If petroleum hydrocarbons are detected, then the suggested analytical methods would be appropriate for confirmation.
- f) Please see response to Aspect Comment #GC-A and Ecology response to City of Kent Comments (RS Section Y.5, Concerns on Contingency Plan. and Sections J.1 and J.2, Protectiveness of Long Term Monitoring Frequency).
48. a) Please see response to Aspect Comment #GC-A and Ecology's response to City of Kent Comment (RS Section Y.5, Concerns on Contingency Plan). The time for reporting detections of groundwater contamination at or above triggers are specified in the CMP. All monitoring data will be available to the public on Ecology's web site and through their EIMS database. Whether Ecology separately informs selected stakeholders of a detection will be determined by Ecology protocols.
- b) The PLP Group will notify Ecology within 7 days of a detection at a sentinel well at or over 0.25 MTCA CUL. Whether Ecology informs selected stakeholders of a detection is up to Ecology.
- c) Please see response to Aspect Comment #GC-A and Ecology response to City of Kent Comment (RS Section Y.5, Concerns on Contingency Plan).

- d) i) The monitoring location and depth interval where a contaminant initially arrives will be used for evaluating plume migration. Please also see responses to Aspect Comment #GC-A and Ecology response to City of Kent Comment (RS Section Y.5, Concerns on Contingency Plan).
- d) ii) The Final CAP will require the Groundwater Extraction and Treatment System to operate until groundwater is below 0.5 MTCA CULs at the compliance wells and the pumped effluent for four consecutive monitoring events (minimum of 1 year), instead of at 1.0 MTCA CULs. Although groundwater is not considered contaminated below MTCA CULs, the revision to discontinue operation of the contingency system will provide additional protection.
49. Please see Ecology comments to City of Kent Comment (RS Section T.2, Provision for Termination of O&M and Institutional Controls).
50. We do not agree that this statement is false or misleading. Currently, groundwater does meet remediation goals at the Site's designated points of compliance.
51. Please see responses to Aspect Comment #SC-5.
52. Any landfill and most MTCA/CERCLA sites cannot accurately estimate the quantity of contaminants present, especially when the wastes are so heterogeneous and separated into individual drums and largely inaccessible. These are among the reasons the wastes were not further characterized at this Site. The referenced language complies with MTCA and is consistent with Ecology practice at landfill and other containment sites. See also response to Aspect Comment #SC-9.
53. Surface water MTCA CULs are not applicable at the portals. See response to Aspect Comment #SC-2.
54. The schedule identifies the relevant milestones required under the Consent Decree. More details on notification and submittal requirements are presented in the FCAP and CMP.
55. The schedule is appropriate, reflecting time anticipated for Ecology approvals and limitations on construction outside the approved construction window.
56. It is Ecology's decision as to whether a specific time period will be required for reporting CMP results if the results do not indicate contaminant detections. The CMP identifies timely notification to Ecology if contamination is detected.
57. This comment is a statement and does not require a response. Exhibit D Introduction will be made consistent with any changes made to Parts A, B, and C.
58. The intent was to have laboratories report the MDL levels and to report detections above MDLs, but below the PQLs, as J qualified values. We will revise the section to clarify laboratory reporting requirements.
59. We will qualify the sentence to state that "no media outside the waste disposal portion of the mine".
60. We will change "designed" to "conceptualized". The design will be started based on revised triggers presented in Ecology's response to City of Kent Comment (RS Section Y.5, Concerns on Contingency Plan) and response to Aspect General Comment #GC-A and presented in Table 1.
61. Please see Ecology's response to City of Kent comment (RS, Section K, Monitoring Well Installation for Cap Performance Monitoring).
62. a) Please see Ecology's response to City of Kent comment (RS, Section K, Monitoring Well Installation for Cap Performance Monitoring).



- b) Please see Ecology's response to City of Kent comment (RS, Section M, Omission of 1,4-Dioxane from Analytical Suite). We agree that it is appropriate to drop PCBs from the monitoring program, subject to Ecology's approval.
63. Consistent with the response to Aspect Comment #GC-A, the CMP's protection monitoring section will be revised to provide new triggers for installation and operation of the Contingent Groundwater Treatment and Extraction System. The north Portal #2 water will be used during protection monitoring as the north sentinel monitoring location. The contingent Groundwater Extraction and Treatment System will be designed, submitted for Ecology approval, and permitted upon a confirmed exceedance of 0.5 MTCA CUL at a sentinel well. The system will be installed if the confirmed groundwater concentration exceeds the MTCA CUL at a sentinel well. The system will become operational if the groundwater has a confirmed exceedance of 0.5 MTCA CUL at a compliance well.
64. Please see response to Aspect comment #SC-40.
65. a) NWTPH-HCID is a good screening analysis for TPH. If TPH is detected at a sentinel well, confirmation analysis will be done by NWTPH-Dx or NWTPH-Gx, whichever is applicable based on the screening results.
- b) We will provide specific GC/MS analysis in the referenced section. Regarding 1,4-dioxane, please see Ecology response to City of Kent comment (RS, Section M, Omission of 1,4-Dioxane from Analytical Suite).
- c) Please see Ecology's response to City of Kent comment (RS Section X, Factors such as earthquakes that potentially cause contaminant movement) and response to Aspect Comment #GC-H.3.
66. Please see response to Aspect General comment #GC-A and presented in Table 1 and review Ecology's responses to the City of Kent Comments (RS Section Y.5, Concerns on Contingency Plan, and Sections J.1 and J.2, Protectiveness of Long Term Monitoring Frequency).
67. a) Please see response to Aspect General comment #GC-A and presented in Table 1 and review Ecology's responses to the City of Kent Comments (RS Section Y.5, Concerns on Contingency Plan).
- b) Please review Ecology's responses to the City of Kent comments (RS Section Y, Concerns on Contingency Plan). Also see Responses to Aspect comments #GC-A and SC-11.
- c) As stated in the comment, this subject was commented and responded to previously.
68. Please see responses to Aspect comment #SC-65. The four new sentinel wells will be installed before construction. We will not revise Table A-2 to have the field parameters grouped together with footnotes defining which field parameters are included.
69. Routine inspections will be scheduled as described in the CAP. Inspections will also occur after intensity IV earthquakes (see Exhibit D – Part B). Additional inspections are not needed to maintain the cap.
70. We will provide Ecology with a checklist for Site inspections for their approval with submittal of the draft EDR.
71. Please see Ecology's response to City of Kent comment (RS Section T.2, Provision for Termination of O&M and Institutional Controls).
72. A seed mixture will be identified in the EDR to be the standard WSDOT erosion control seed mixture or equivalent.

73. Comment 73 simply refers to Aspect's prior comments on the Contingency Plan, responses to which are provided above.
74. Please see response to Aspect Comment #SC-26.
75. Please see Ecology's response to City of Kent comment (RS, Section K, Monitoring Well Installation for Cap Performance Monitoring).
76. Please review Ecology's responses to the City of Kent comments (RS Section Y, Concerns on Contingency Plan). Also see responses to Aspect Comments #GC-A and SC 11.
77. Please see response to Aspect Comment #GC-A and -G, and Ecology's response to City of Kent comment (RS Section Y.5, Concerns on Contingency Plan).
78. Please see response to Aspect comment #SC-37.
79. a) Please see Ecology's responses to the City of Kent comments (RS Section Y.5, Concerns on Contingency Plan) and responses to Aspect Comments #GC-A and SC-11.
- b) Please see Response to Aspect comment #SC-5.
80. Please see response to Aspect comment #SC-5. The final approvals and permitting of the contingent treatment system effluent pipeline connection to Soos Creek sanitary sewer is anticipated and will be completed when required. Since the system operation will only be necessary if there is a threat to human health and the environment, Ecology has committed to make the determination that the system is needed for the protection of public health and ensure the final discharge pipeline connection is constructed.
81. Please see response to Aspect Comment #SC-37.
82. a) As discussed in response to Aspect comment #SC 11, we have determined that 40 gpm is the maximum amount of groundwater needed for containment at a portal, but the extraction wells will be capable of pumping higher volumes if needed to achieve containment. A pump test does not need and should not be conducted now, since the remedial actions will change the hydraulics of the system. A pump test can be conducted when and if contaminants are ever detected above trigger levels, prompting construction of the contingent groundwater treatment system. The groundwater extraction system will be installed in the proper location for containment of detected contamination and will be tested, including the installation of performance monitoring wells, to determine the optimal long-term pumping rate. With the revised contaminant concentration triggers, there will be sufficient time for pump test optimization before contaminants reach the compliance well(s) at the MTCA-CULs. More details are presented in Exhibit D – Part C.
- b) The groundwater extraction system will be operated in a manner that will contain contaminated groundwater from migrating off-Site. As needed, performance wells will be included in the system design and installed for determining containment. Uncontaminated groundwater does not need to be extracted and treated by the containment system.
- c) The extraction/containment system will include the monitoring devices suggested by Aspect and additional devices not mentioned in Exhibit D (i.e., water level transducers). We will provide more detail in the referenced section, but the design details will be made and submitted to Ecology with the system design and O&M plan.
83. We will revise the exhibit nomenclature as suggested.
84. The language in Section 6 of the proposed Environmental Covenants is taken without modification from Ecology's standard form Environmental Covenant. Section 6 complies with MTCA by tracking the

language in WAC 173-340-440(12) ("Removal of Restrictions"). That provision states that if the conditions at the site at issue requiring the environmental covenant no longer exist, the owner may submit a request to Ecology to remove the covenant. The covenant cannot be removed, however, without Ecology approval after public notice and an opportunity to comment.

85. The Remedial Design already provides a significant buffer around the "Site" (as depicted in the Site Diagram attached to the Consent Decree in Exhibit A) anywhere from 200' up to 500' at some points except for the SW corner at the LMW-5 parcel. The Consent Decree requires, however, that the PLPs make a good faith effort to obtain an environmental covenant (attached to the Consent Decree as Exhibit E-2) from the owner of the property outside of the SW corner of the Groundwater and Portal Protection Area. Additionally, the DCAP requires a monitoring well system that includes both sentinel and compliance wells along with the contingent groundwater treatment plan as modified in Ecology's Responsiveness Summary. The compliance boundary already provides a robust buffer to encompass the "Site", while it should be clarified that the original dimensions of the physical "Black Box" was defined as the actual mine workings that is even further within the Site boundary shown in blue.
86. The boundary for the environmental covenant does encompass the entire Site as depicted in the Site Diagram attached to the Consent Decree as Exhibit A. The groundwater use restriction boundary is not arbitrary, but is based on the existence of groundwater hydraulic sinks created by the two adjacent mine workings. The Frasier Mine did not extend to the south nearly as far as the Rogers and Landsburg mines extended. The boundary to the southwest (we assume that the commenter meant southwest instead of southeast) was based on property ownership, but provides a protective buffer for potentially impacted groundwater migration. Please see also response to Comment #SC-85 above.

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