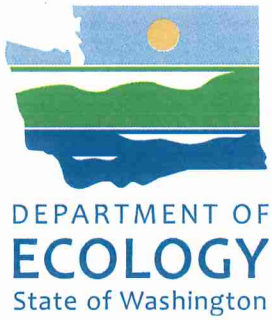

FINAL CLEANUP ACTION PLAN
HEGLAR KRONQUIST SITE
CSID 1135
FSID 645

Prepared by
Washington State Department of Ecology
Eastern Regional Office
Toxics Cleanup Program
Spokane, WA

October 2012

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EXECUTIVE SUMMARY

This Final Cleanup Action Plan (FCAP), developed in accordance with the Model Toxics Control Act (MTCA), Chapter 70.105D RCW and Chapter 173-340 WAC, presents the selected remedial action for the Heglar Kronquist Site located near Mead, Washington. Approximately 55,000 cubic yards of aluminum black dross (dross) were disposed into this almost 4-acre-quarry, and unpermitted landfill, from 1969 to 1974.

This landfill was capped in 1984 to prevent the leaching of dross constituents to groundwater. This cap reduced infiltration through the dross. However, the MTCA Remedial Investigation conducted in 2011 showed that limited leaching still occurs, resulting in exceedances of state standards for chloride and nitrate concentrations in shallow groundwater and drainage ditch surface water.

The Feasibility Study conducted in 2012 evaluated two remedial alternatives that are applicable to the cleanup of the Site. Alternative 1 involves the removal of the dross and off-site disposal in a permitted landfill; Alternative 2 provides for the enhancement of the current cap, keeping the dross in place, and for critical protection requirements to ensure continued protection of human health and the environment.

Based on the evaluation of these two alternatives using MTCA criteria, Ecology selected the following cleanup actions:

- Cap enhancement as described in the final FS.
- Dispersion/dilution of contaminants in groundwater/surface water.
- Compliance Monitoring
- Institutional Controls to include an Environmental Covenant, cap maintenance requirements, and financial assurance.
- Periodic reviews.

Ecology has determined this selected remedy is protective of human health and the environment, and meets the requirement of RCW 70.105D.030 (1)(b) that says:

" ....In conducting, providing for, or requiring remedial action, the department shall give preference to permanent solutions to the maximum extent practicable and shall provide for or require adequate monitoring to ensure the effectiveness of the remedial action."

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TABLE OF CONTENTS

Contents

LIST OF FIGURES

LIST OF ACRONYMS

ARARs	Applicable, Relevant and Appropriate Requirements
CAP	Cleanup Action Plan
DCAP	Draft Cleanup Action Plan
FCAP	Final Cleanup Action Plan
CFR	Code of Federal Register
EPA	Environmental Protection Agency
FS	Feasibility Study
MCL	Maximum Contaminant Limit
sMCL	Secondary Maximum Contaminant Limit
MTCA	Model Toxics Control Act
PLPs	Potentially Liable Parties
RCRA	Resource Conservation and Recovery Act
RCW	Revised Code of Washington
RI	Remedial Investigation
WAC	Washington Administrative Code

1.0 INTRODUCTION

1.1 The Cleanup Process and the Cleanup Action Plan

The Cleanup Action Plan (CAP) is one of a series of documents used by Ecology in the cleanup process conducted under the Model Toxics Control Act (MTCA), Chapter 70.105D RCW, and implemented under Chapter 173-340 WAC. A CAP is developed using Remedial Investigation (RI) information that defines the extent and magnitude of contamination at a site and applicable technologies from the Feasibility Study (FS). The Draft Cleanup Action Plan (DCAP) is subject to public review and comment before it is finalized. After review and consideration of the comments received during the public comment period, the department shall issue a Final Cleanup Action Plan (FCAP).

WAC 173-340-380(1)(a) describes the requirements of a DCAP. The DCAP shall include: a general description of the proposed cleanup action developed in accordance with WAC 173-340-350 through 173-340-390; a summary of the rationale for selecting the proposed alternative; a brief summary of other cleanup action alternatives evaluated in the feasibility study; cleanup standards; the schedule for implementation including, if known, restoration time frame; institutional controls; applicable state and federal laws; a preliminary determination by the department that the proposed cleanup action will comply with WAC 173-340-360; and, where the cleanup action involves on-site containment, specification of the types, levels, and amounts of hazardous substances remaining on site and the measures that will be used to prevent migration and contact with those substances.

1.2 Purpose and Objectives

Ecology is issuing this FCAP after having completed the public comment period for the DCAP, and after review and consideration of the comments received. This decision document presents Ecology's selected cleanup action for the Heglar Kronquist Site (the Site). The selected cleanup action is chosen based upon information in the following documents:

- Exponent, Final Remedial Investigation Report, Heglar Kronquist Site, September 9, 2011.
- Exponent, Final Feasibility Study, Heglar Kronquist Site, May 2012.

Portions of the text and the figures of this FCAP and DCAP are taken directly from these documents.

1.3 Declaration

Ecology's selected cleanup action will comply with WAC 173-340-360. This selected remedy is protective of human health and the environment, and is consistent with the preference for permanent solutions to the maximum extent practicable requirement under RCW 70.105D.030(1)(b).

1.4 Applicability

This CAP is applicable only to the Heglar Kronquist Site. Cleanup standards and cleanup actions have been developed as an overall remediation process being conducted under the MTCA, and should not be considered as setting precedents for other sites.

1.5 Administrative Record

The documents used to make decisions discussed in this DCAP and FCAP are constituents of the administrative record for the Site. The entire administrative record for the Site is available for public review by appointment at Ecology's Eastern Regional Office, 4601 N. Monroe, Spokane, WA 99205-1295. Documents that were made available for public comment and review are also available at the North Spokane Public Library, Hawthorne Branch, 44 E. Hawthorne Rd., Spokane, WA 99218.

2.0 BACKGROUND INFORMATION

2.1 Site Description

The Heglar Kronquist Site is located near Mead, Washington near the intersection of E. Heglar and E. Kronquist Roads approximately 10 miles northeast of downtown Spokane, Washington.

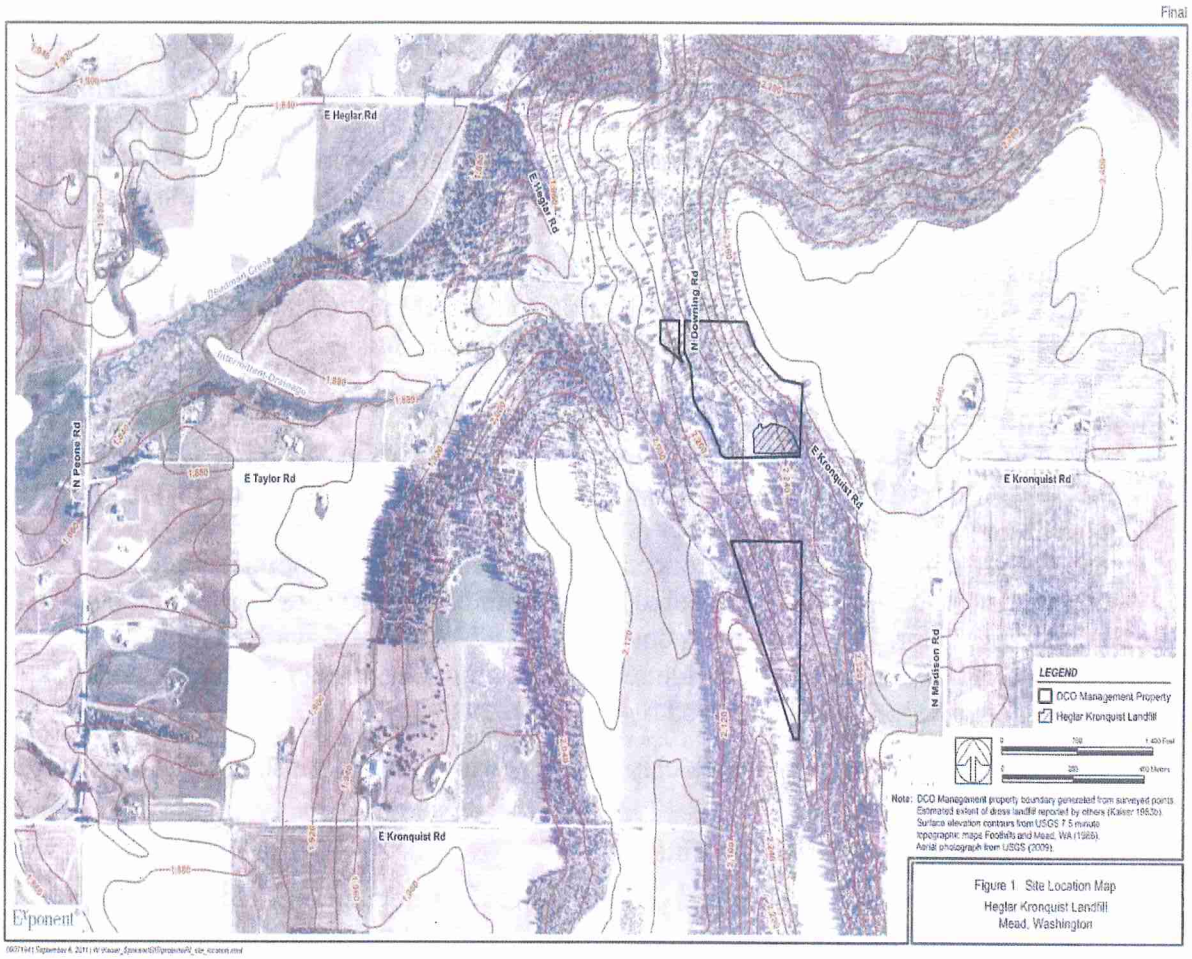

FIGURE 1. SITE LOCATION MAP

The Site is located in a rural area and is classified "Resource Lands" and zoned as "Small Tract Agricultural". It is located in a complex hydrogeologic area, mapped as landslide material on the Washington State Geologic Map.

2.2 Site History

The Site was used as a gravel pit until it was closed in 1969. From 1969 until 1974, Gemini Management, Inc. transported and disposed of aluminum black dross (dross) from the Kaiser Trentwood Plant in the Spokane Valley in this abandoned pit. Approximately 55,000 cubic yards of dross were disposed of into the 4-acre-quarry. Except for one report of a neighbor dumping refuse into this pit, there is no evidence that anything other than black dross was placed in this abandoned pit.

The landfill property, shown as Parcel 1 in Appendix A and referred to as the Heglar Kronquist Site, was deeded to Kaiser Aluminum & Chemical Corporation (Kaiser), now known as DCO Management in 1984. The legal description of this landfill property is also attached in Appendix A. In 1991, the rest of the Kaiser property shown in Appendix A was deeded to Kaiser and all properties were combined into one tax parcel.

Black dross is a by-product of aluminum processing. According to Kaiser's records, the black dross in the landfill is composed of: 39% sodium chloride, 35% aluminum oxide, 19% potassium chloride, 4% free aluminum, 2% cryolite, and 1% carbides and nitrides.

Black dross disposal stopped in 1974 when elevated levels of chloride and sodium were detected in one shallow water supply well and a spring near the Site. The Environmental Protection Agency (EPA) conducted water and air sampling in 1979 and documented impacts to groundwater, surface water (springs), and air from the landfill dross. Impacts to groundwater included elevated concentrations of chloride and sodium. Elevated ammonia concentrations were measured in air; ammonia is a result of a reaction between the dross and water. Kaiser hired a consultant in 1979 to review available data and to investigate the Site in order to provide recommendations for further action. As a result the following actions were conducted by Kaiser in 1983/1984:

- Construction of a 2-ft thick clay cover with a vegetated topsoil surface to reduce infiltration
- Construction of drainage ditches
- Installation of a passive gas venting system in a new, permeable gravel layer
- Construction of a fence to restrict access
- Start of groundwater and surface water monitoring.

Based on surface water (springs) collected down gradient from the site, a 50% reduction of concentrations of chloride was observed from 1983 to 1987 after the installation of the cap. However, surface water data show concentrations of chloride still exceed the secondary maximum contaminant level (sMCL) for chloride and the primary maximum contaminant level (MCL) for nitrate. (MCL and sMCL are drinking water standards.)

In 2006, Ecology conducted a Site Hazard Assessment of the Site. The Site's hazard ranking was determined to be a 2, where 1 represents the highest risk and 5 the lowest.

In 2008, Ecology named Kaiser a Potentially Liable Party for the Site under the authority of MTCA. Kaiser signed an Agreed Order with Ecology in 2009 to complete a Remedial Investigation (RI) and Feasibility Study (FS) under WAC 173-340. The purpose of the RI is to collect data needed to adequately characterize the contamination at the site so cleanup action alternatives can be developed and evaluated in the FS. The RI was completed in 2011 and the FS was completed in 2012. The draft final RI Report and the draft final FS were all made available for public review and comment before being considered final. Ecology prepared a Responsiveness Summary in August 2011 and in April 2012, responding to comments received during the public comment period for the draft final RI Report and the draft final FS, respectively.

Before Kaiser signed the Agreed Order in 2009, Kaiser and Ecology jointly conducted a private well and spring sampling in December 2008 and January 2009 to allay concerns of residents in the vicinity of the Site regarding their drinking water. Additional sampling of three private wells was also conducted during the RI. No drinking water well was determined to be impacted with contaminants from the dross.

2.3 Site Physical Characteristics

2.3.1 Site Geology

The landfill is situated on the eastern end of the landslide block with the slide plane immediately to the east of the landfill. The original pit into which the dross was placed was created by mining this broken basalt in the landslide block. The mesa east of the slide plane and the Site is capped with up to 70 ft of loess of the Palouse Formation described as mostly clay. The Palouse overlies the Columbia River basalt which is underlain by the Latah Formation.

The landslide block west of the slide plane consists of varying sizes of basalt boulders and blocks, along with silty sandy basalt gravels. West and north of the landslide block are thinly covered granites (west) and exposed granites. Farther to the west, along the major drainages, the granites are covered by glacial deposits and in some places younger alluvium.

The following figures are two selected cross sections from the Final RI Report showing the geology of the area. The Final RI presents more cross sections and detailed discussions.

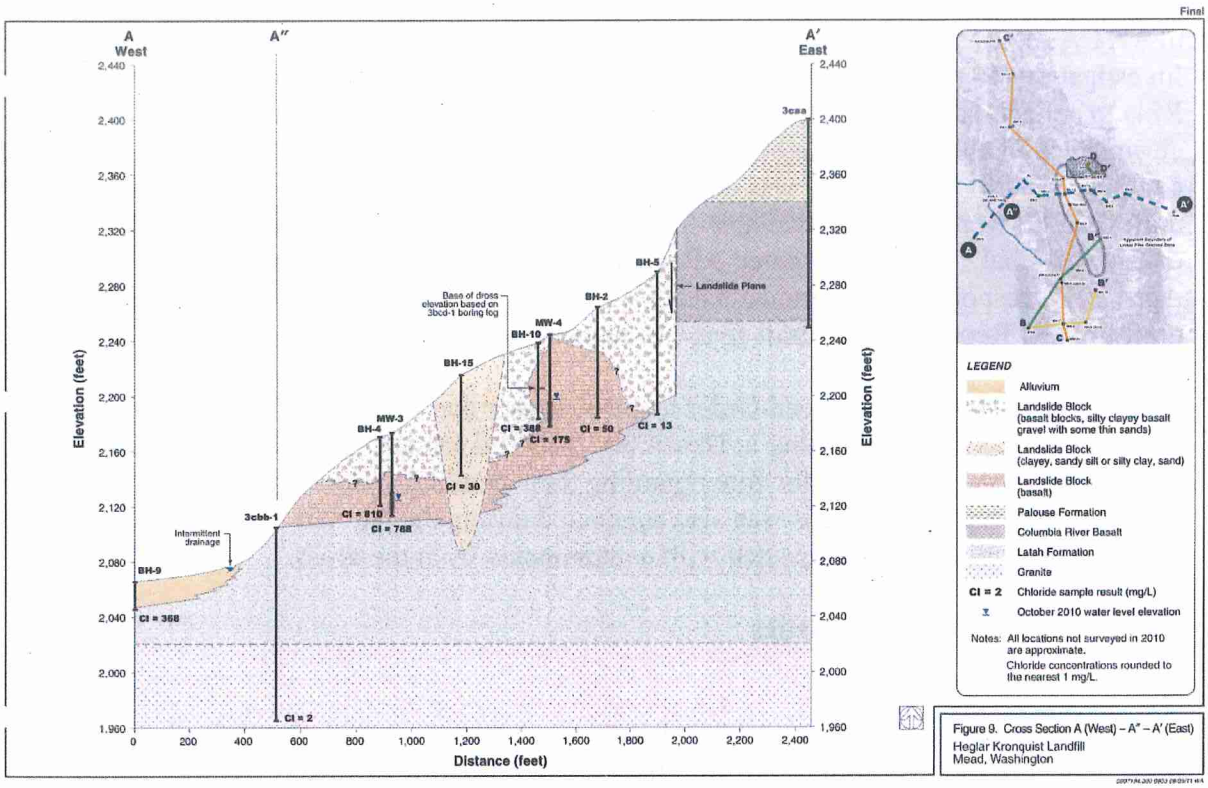

FIGURE 2. CROSS SECTION A-A'

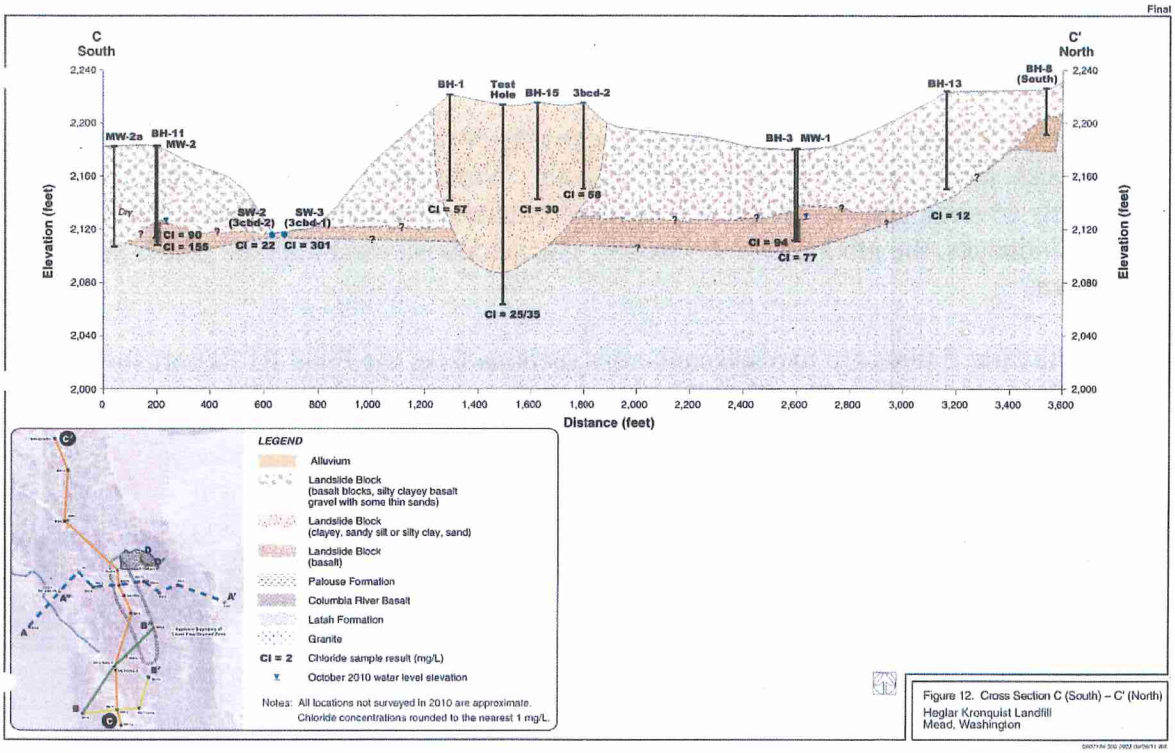

FIGURE 3. CROSS SECTION C-C'

As seen from these cross sections in Figures 2 and 3, and in also Figure 4, there is a narrow, linear fine-grained sediment zone in the landslide block which trends northwesterly as outlined.

2.3.2 Site Hydrogeology

The groundwater flow at the Site is complex. Groundwater flow at the Site is shown in the accompanying Figure 4 and is described as follows:

- Flow from the landfill area northwestward toward MW-1.
- Flow around the north end of the fine-grained zone and then southwest through the MW-3 area toward MW-2. With ultimate discharge through Springs SW-2 and/or SW-3.
- A flow segment between the landfill and the BH-10 and MW-4 area.

The groundwater discharging from spring 3cbd-1 goes to a drainage ditch as surface water.

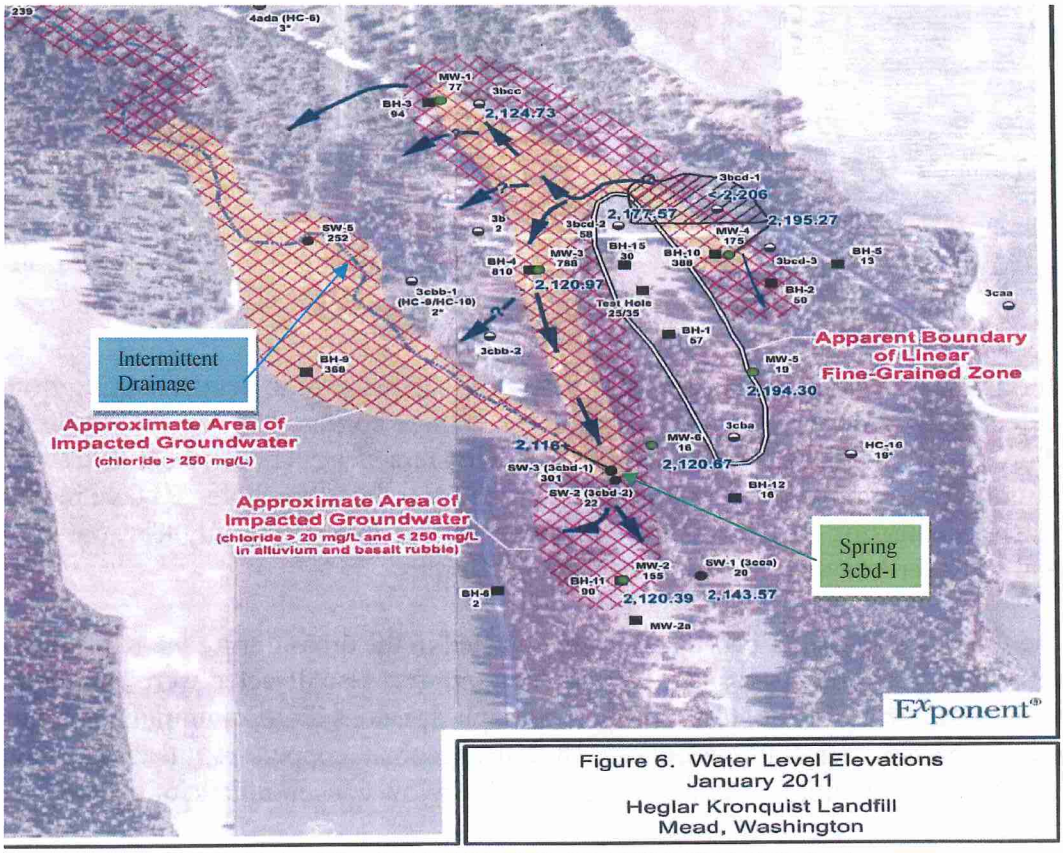

FIGURE 4. GROUNDWATER FLOW DIRECTIONS

3.0 NATURE OF CONTAMINATION

3.1 Dross

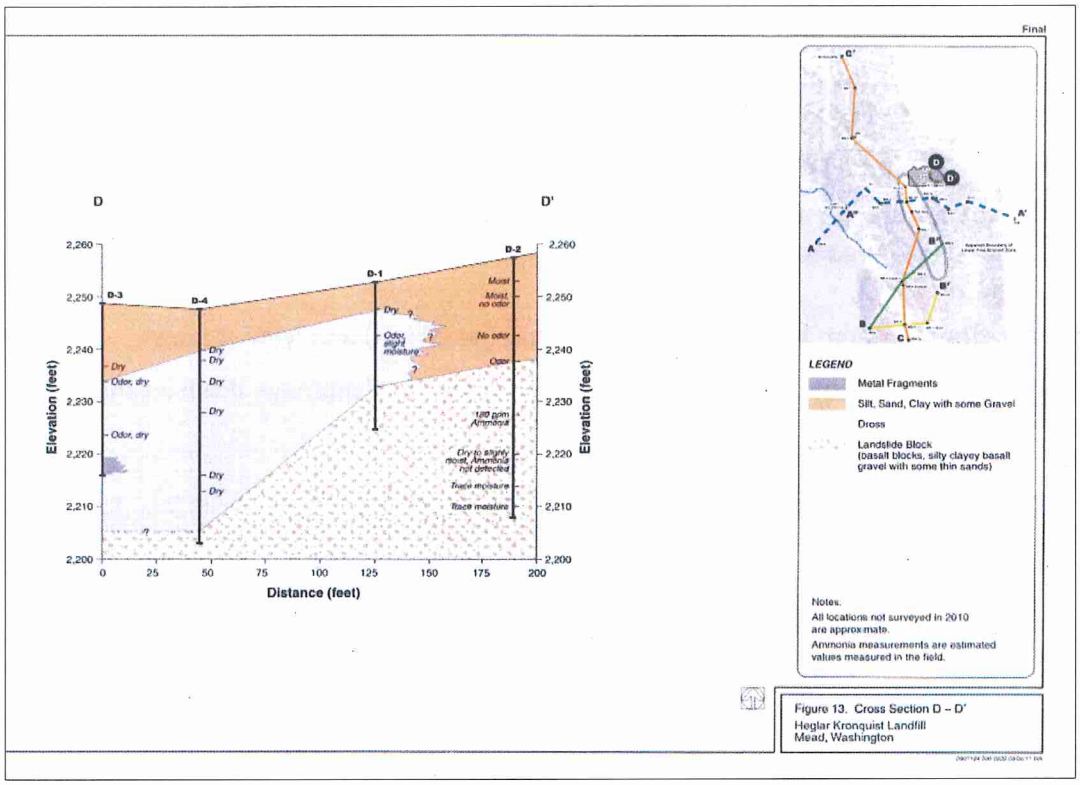

FIGURE 5. DROSS CROSS SECTION

During the RI, dross was encountered below the cap material to depths ranging from 5 to 43 feet at three locations. Dross encountered in these borings was dry with the exception of dross at location Boring D-1, where some moisture was encountered at levels below saturation. Groundwater was not encountered in any dross borehole. RI data indicate water is contacting black dross via surface infiltration into and gravity flow out of the landfill under less than saturated moisture conditions.

The following indicator substances were detected in the dross during the RI: chloride, potassium, sodium, magnesium, calcium, and nitrate. Also detected were: ammonia as nitrogen, fluoride, nitrite, total nitrogen, orthophosphate, sulfate, aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, iron, lead, manganese, nickel, silver, thallium, vanadium, and zinc. Very low concentrations of cyanide and PCBs were detected in one boring.

RI investigations show there are impacts resulting from dross in the landfill. These impacts are a result of leaching caused by the infiltration of precipitation through the dross thus impacting shallow groundwater and the springs in the area.

3.2 Groundwater and Surface Water

Chloride, nitrate, and total dissolved solids (TDS) are the dross constituents that exceed standards in groundwater. Sodium exceeds the 2,400 mg/L daily dietary goal for sodium. Elevated TDS in the groundwater and surface water is a result of the high chloride concentrations. An ecological survey and data screening on chloride and nitrate concentrations in groundwater and in surface water indicate that they do not pose an unacceptable risk to livestock, aquatic species, or crop species.

The Site indicators which will be used for defining site cleanup requirements in groundwater are those that exceed the standards. Based on the above discussions, these site indicators are **chloride** and **nitrate**. TDS is directly related to chloride.

Chloride is the dross constituent that would best describe landfill impacts to groundwater and surface water. It is a good tracer because it does not readily adsorb in a groundwater system. RI data show all other constituents of dross correlate well with the chloride in groundwater, except for nitrate which is also being contributed by other sources in the area including cattle and fertilizers.

The approximate extent of groundwater exceeding state standards is the area where groundwater exceeds the 250 mg/L chloride concentration (see Figure 6). Groundwater adjoining the upper reaches of the drainage ditch is impacted by the discharge from spring 3cbd-1.

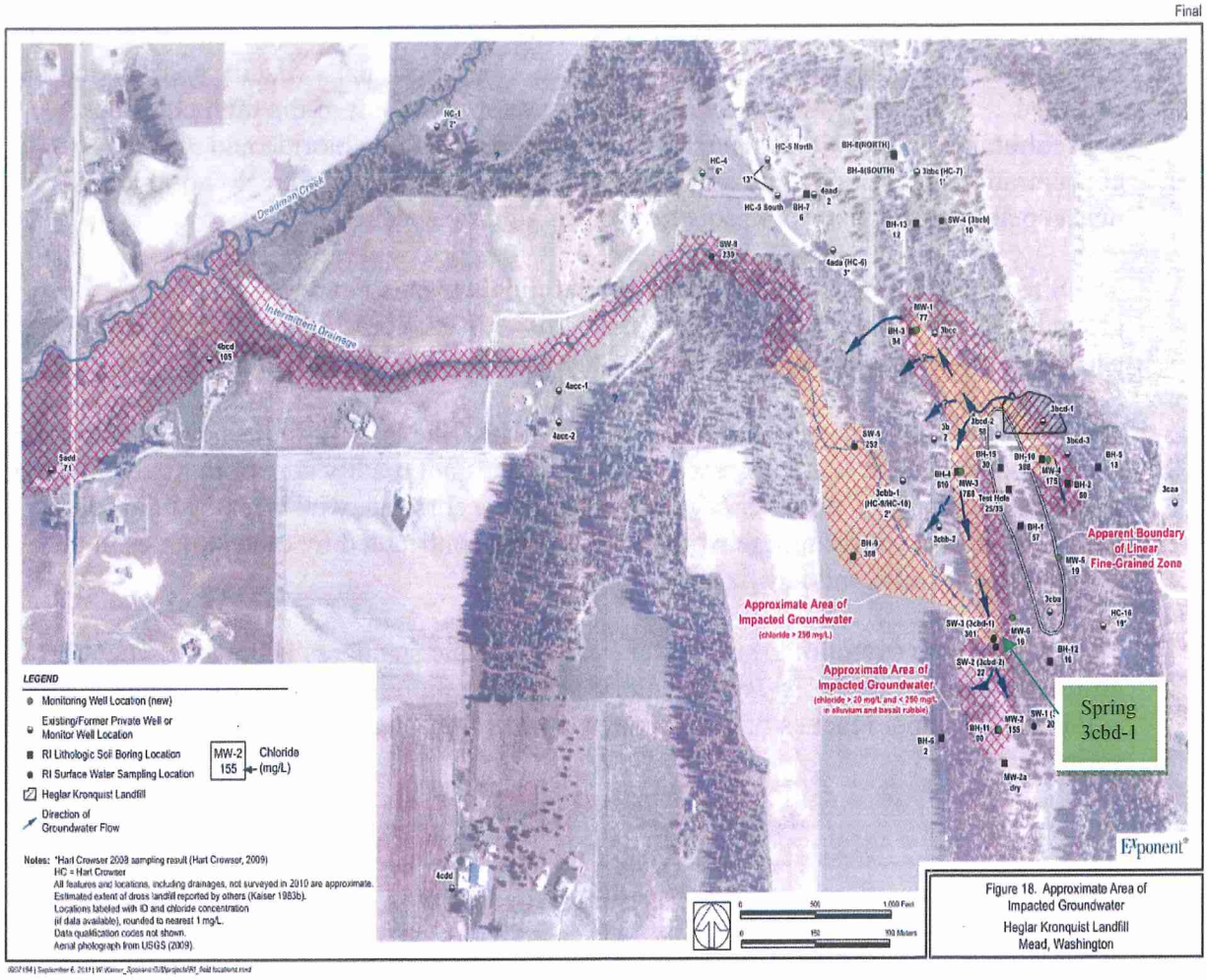

FIGURE 6. APROXIMATE EXTENT OF IMPACTED GROUNDWATER (the yellow area is where the chloride concentrations exceed the cleanup level of 250 mg/L)

3.3 Air

Air concentrations of contaminants measured during the RI were below cleanup levels.

3.4 Current and Potential Pathways of Exposure

Under current conditions of the capped landfill, the potential exposure pathways for dross-related contaminants are: human exposure related to the ingestion of contaminated shallow groundwater; and, human incidental ingestion of the contaminated spring water.

4.0 CLEANUP STANDARDS

MTCA cleanup standards consist of the following:

(a) Cleanup levels for hazardous substances present at the Site;

(b) The location where these cleanup levels must be met (point of compliance); and,

(c) Other regulatory requirements that apply to the site because of the type of action and/or location of the site ("applicable state and federal laws").

A cleanup level is 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. Cleanup levels, in combination with points of compliance, typically define the area or volume of soil, water, air, or sediment at a site that must be addressed by the cleanup action.

The first step in setting cleanup levels is to identify the nature of the contamination and the potentially contaminated media, the current and potential pathways of exposure and receptors, and the current and potential land and resource uses.

MTCA provides three options for establishing cleanup levels. These options include:

- Method A is designed for simple cleanups at smaller sites involving only a few hazardous substances. Method A provides tables of cleanup levels for selected substances. The Method A cleanup level for a substance must be at least as stringent as the concentration in the Method A table and the concentrations established under applicable state or federal laws.
- Method B cleanup levels are established using applicable state and federal laws and the risk assessment equations, and other requirements specified for each medium. Method B may be used at any site and is the most common method for setting cleanup levels when sites are contaminated with substances not listed under Method A.
- Method C is similar to Method B. Method C cleanup levels are based on less stringent exposure assumptions and ten times higher individual and total cancer risks for the substances on a site.

Under MTCA, in cases where cleanup levels are below the natural background or below levels that can be reliably measured, the cleanup levels shall be established at a concentration equal to the natural background or the practical quantitation limit.

Based on discussions presented in Section 3, cleanup standards are developed for nitrate and chloride in groundwater and surface water.

4.1 Groundwater Cleanup Levels

The Method A tables do not provide cleanup levels for chloride and nitrate. Therefore Method B is the most appropriate based on a drinking water beneficial use. Method B cleanup levels shall be at least as stringent as all of the following:

- Applicable state and federal laws (Federal maximum contaminant levels (MCLs), Maximum contaminant level goals (MCLG) for noncarcinogens, State maximum contaminant goals.)
- Protection of surface water beneficial uses unless it can be demonstrated the hazardous substances are not likely to reach surface water.
- Method B equations for hazardous substances for which sufficiently protective health-based criteria or standards have not been established under applicable state and federal laws.

If the most stringent level is below the background concentration, the cleanup level will be set at the background. The table below presents the applicable groundwater criteria and the final groundwater Method B cleanup level for chloride and nitrate.

Groundwater Cleanup Level Criteria/Method B Cleanup Levels

Substance	ARARs		Protection of drainage surface water[a]	Method B Equation		Background	Groundwater Method B Cleanup Level
	MCL	SMCL		Carcinogen	Non-carcinogen		
chloride	NA	250	250	NA	NA	20	250
nitrate	10	NA	10	NA	NA	14.4	14.4

NA – Not available
[a] This seasonal intermittent drainage ditch does not support aquatic life. Surface water standards are set on protection of groundwater.

4.2 Surface Water Cleanup Levels

Surface water impacted by dross substances (nitrate and chloride) is in a drainage ditch where groundwater coming out as springs discharges. This drainage ditch does not support aquatic life. The ecological assessment conducted in the RI showed chloride concentrations do not result in unacceptable exposure to ecological receptors at and in the vicinity of the Site. Therefore surface water cleanup levels are being set on the protection of groundwater surrounding the drainage.

Method B cleanup levels are also appropriate for surface water. Since surface water cleanup levels are based on the protection of groundwater, the cleanup levels for surface water will be same as those for groundwater. These levels are indicated in the table below.

Surface Water Method B Cleanup Levels

Substance	Method B Cleanup Level, mg/L
chloride	250
nitrate	14.4

4.3 Points of Compliance

For groundwater, the standard point of compliance is throughout the Site. For surface water, the point of compliance is the point or points at which hazardous substances are released to surface water of the state. For this Site, the spring discharging to the drainage ditch is the point of compliance for surface water.

5.0 PROPOSED CLEANUP ALTERNATIVES

5.1 Cleanup Action Objectives

The primary objective is to eliminate the leaching of dross constituents to groundwater that result in concentrations of nitrate and chloride exceeding state standards in shallow groundwater.

The other cleanup action objective for the Heglar Kronquist Site is to prevent the dermal contact and ingestion of shallow groundwater and surface/drainage water with nitrate and chloride concentrations exceeding the state standards.

5.2 Summary of FS Cleanup Alternatives

The FS evaluated remedial technologies applicable to the Site. Based on criteria identified under MTCA, an initial screening was conducted in the FS Report that eliminated technologies not applicable to the Site. Two remedial alternatives were determined as applicable to the Site.

- Alternative 1 – Waste Removal, Off-site Disposal, Dispersion/Dilution, and Compliance Monitoring
- Alternative 2 – Cap Enhancement, Institutional Controls, Dispersion/Dilution, and Compliance Monitoring

5.2.1 Alternative 1

This alternative includes the following:

- Removal, by excavation, of the existing cap and approximately 55,000 cubic yards of black dross. The excavation would last for one to two years depending on the weather conditions.
- Disposal of the excavated dross at an offsite, permitted landfill. Approximately 1,860 dump truck loads of dross and 448 dump trucks loads of over-excavated soils would be transported for one to two years during removal actions. Acceptance of black dross in a permitted landfill is not guaranteed since the black dross becomes reactive when exposed to water. Most of the black dross from this location is dry and therefore unreacted. A permitted hazardous waste landfill would most likely require pre-treatment or pre-processing of the dross prior to landfilling.
- Dispersion/dilution of chloride and nitrate in shallow groundwater.

- Compliance Monitoring – This would consist of protection, performance, and confirmational monitoring as required under WAC 173-340-410. Protection monitoring would confirm human health and the environment are adequately protected during the excavation and trucking of dross and other excavation materials off-site. Performance monitoring would be conducted to confirm groundwater has attained cleanup standards. Confirmational monitoring of groundwater would confirm the long-term effectiveness of the cleanup action once cleanup standards have been attained.

5.2.2 Alternative 2

This Alternative includes the following:

- Cap Enhancement – In 1984, this landfill was capped with a passive gas venting system buried in 1 ft of gravel, and covered with 2 ft of compacted clay and 2 ft of top soil vegetated with native grasses. In July 1994, test pits were excavated to evaluate this cap and 1.7 ft clay and an average of 1.5 ft of top soil were encountered. Test pits excavated during the RI did not show this description of the cap. In May 2011, rodent burrow holes were discovered across the landfill, primarily in the eastern area. In addition, one RI dross boring was moist and ammonia was detected in the gas vents. Thus, moisture is still being infiltrated through the cap over a limited area. In order to eliminate infiltration of surface water due to precipitation through the dross, the existing cap would be enhanced and the vent system would be repaired, as necessary.

  Cap enhancement would include the placement of a less permeable layer, referred to as high-density polyethylene (or HDPE) that is not prone to damage by weather, and placement of a drainage layer that will act as a biological barrier and promote runoff. These added layers are expected to reduce infiltration through the cap by approximately 90 – 99 percent. The cross-section of the proposed enhanced cap design is shown in Figure 7 below. This cap design is in substantive compliance with the overall purpose of WAC 173-304 (Minimum functional standards for solid waste handling).

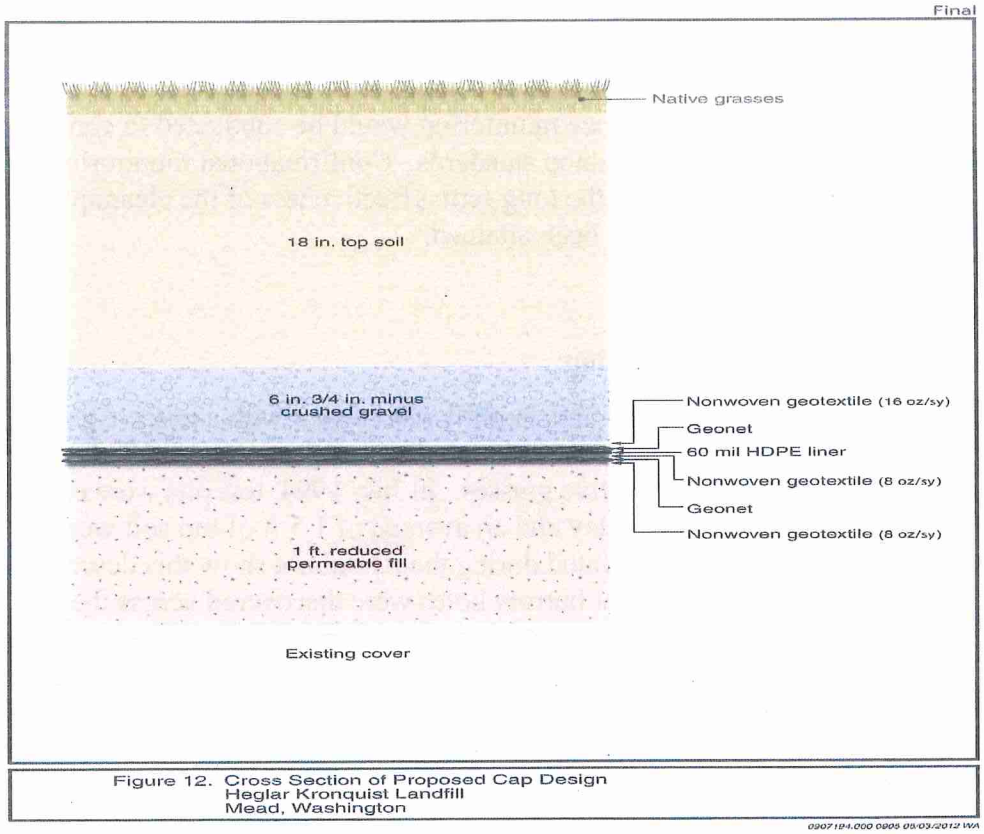

FIGURE 7. CROSS SECTION OF PROPOSED CAP

The existing landfill surface would be graded to a minimum 4 percent grade on the surface from the eastern area of the landfill. After grading, a multi-layer geosynthetic liner system would be placed over the prepared surface followed by a drainage layer. The drainage layer, which would also retard rodent burrowing activity, would consist of a geocomposite layer placed on top of the HDPE, and a 6-in layer of crushed gravel. This geocomposite layer would also protect the HDPE against damage from the crushed gravel.

The geosynthetic layer will extend 5 to 10 feet beyond the identified dross boundary and will be terminated in an anchor trench. The final FS Report presents conceptual designs of the anchor trenches to be used. The existing ditches and swales would be moved away from the landfill on the east and north sides to allow placement of the liner anchor on the landfill side of the ditches and swales. The details of this cap will be presented in an Engineering Design and Construction Plans and Specifications report, prior to construction. The gas vent system will also be repaired, as necessary.

- Dispersion/dilution of chloride and nitrate in shallow groundwater.
- Institutional Controls - These controls would include the inspection and maintenance of the cap system, signage, fencing, and use restrictions for the property. A prohibition on groundwater use will not be needed because this prohibition is published in WAC 173-160-171 with a minimum setback distance for installing new water wells, other than for public water supply, of 1000 ft from the landfill boundary. An environmental covenant would be recorded as part of the landfill property deed to warn future property owners of the condition and to restrict activities or use of the property that could result in compromising the enhanced cap. Cap maintenance and monitoring requirements, including inspections would be documented in a plan.
- Compliance Monitoring - This will consist of protection monitoring, performance monitoring, and confirmational monitoring as required under WAC 173-340-410. Protection monitoring will confirm that human health and the environment are adequately protected during installation of the enhanced cap. Performance monitoring would be conducted to confirm that groundwater has attained cleanup standards; limited air sampling for ammonia would be conducted to see if the cap is preventing the production of ammonia by reducing the infiltration of moisture through the dross. Confirmational monitoring of groundwater would confirm the long-term effectives of the cleanup action once cleanup standards have been attained.

6.0 MTCA'S SELECTION OF CLEANUP ACTIONS PROCESS

6.1 Minimum Requirements for Cleanup

WAC 173-340-360 describes the minimum requirements and procedures for selecting cleanup actions. The minimum requirements, specified under WAC 173-340-360(2), include the following:

(a) Threshold requirements. The cleanup action shall:

- (i) Protect human health and the environment;
- (ii) Comply with cleanup standards;
- (iii) Comply with applicable state and federal laws;
- (iv) Provide for compliance monitoring.

(b) Other requirements. When selecting a cleanup action alternative that fulfills the threshold requirements, the selected action shall:

- (i) Use permanent solutions to the maximum extent practicable;
- (ii) Provide for reasonable restoration time frame; and,
- (iii) Consider public comments.

When selecting a cleanup action, preference shall be given to permanent solutions to the maximum extent practicable. A "permanent solution", under WAC 173-340-200, means a cleanup action in which cleanup standards of WAC 173-340-700 through WAC 173-340-760 can be met without further action being required at the site being cleaned up or any other site involved with the cleanup action, other than the approved disposal of any residue from the treatment of hazardous substances. To determine whether a cleanup action uses permanent solutions to the maximum extent practicable, the disproportionate cost analysis shall be used.

6.2 Disproportionate Cost Analysis [WAC 173-3340-360 (3)(e)]

Costs are disproportionate to benefits if the incremental costs of the alternative over that of the lower cost alternative exceed the incremental degree of benefits achieved by the alternative over that of the lower cost alternative. The following criteria are used to evaluate and compare each cleanup action alternative when conducting a disproportionate cost analysis to determine whether a cleanup action is permanent to the maximum extent practicable:

(i) Protectiveness. This involves overall protectiveness of human health and the environment including the degree to which existing risks are reduced, time required to reduce risk at the facility, and attain cleanup standards, on-site and off-site risks resulting from implementing the alternative, and improvement of the overall environmental quality.

(ii) Permanence. This is the degree to which the alternative permanently reduces the toxicity, mobility, or volume of hazardous substances, including the adequacy of the alternative in destroying the hazardous substances, the reduction or elimination of hazardous substance releases and sources of releases, the degree of irreversibility of waste treatment process, and the characteristics and quantity of treatment residuals generated.

(iii) Cost. This is the cost to implement the alternative, including the cost of construction, the net present value of any long-term costs, and agency oversight costs that are cost recoverable.

(iv) Effectiveness over the long term. This includes the degree of certainty the alternative will be successful, the reliability of the alternative during the period of time hazardous substances are expected to remain on site at concentrations that exceed cleanup levels, the magnitude of residual risk with the alternative in place, and the effectiveness of controls required to manage treatment residues or remaining wastes. The following types of cleanup action components may be used as a guide, in descending order, when assessing the relative degree of long-term effectiveness: reuse or recycling; destruction or detoxification; immobilization or solidification; on-site or off-site disposal in an engineered, lined and monitored facility; on-site isolation or containment with attendant engineering controls; and institutional controls and monitoring.

(v) Management of short-term risks. This includes the risk to human health and the environment associated with the alternative during construction and implementation, and the effectiveness of measures to be taken to manage such risks.

(vi) Technical and administrative implementability. This is the ability to implement the alternative including whether the alternative is technically possible, availability of necessary off-site facilities, services and materials, administrative and regulatory requirements, scheduling, size, complexity, monitoring requirements, access for construction operations and monitoring, and integration with existing facility operations and other current or potential remedial actions.

(vii) Consideration of public concerns. This is to address the concerns of the community regarding the alternative.

6.3 Reasonable Restoration Time Frame

The time required to restore the site (to achieve cleanup and other performance standards) must be considered. The regulation specifies factors that must be considered when determining whether the restoration time frame is reasonable.

6.4 Expectations for Cleanup Action Alternatives [WAC 173-340-370]

WAC 173-340-370 lists the expectations for the development of cleanup action alternatives and the selection of cleanup actions. These expectations include:

(1) The department expects treatment technologies will be emphasized at sites containing liquid wastes, areas contaminated with high concentrations of hazardous substances, highly mobile materials, and/or discrete areas of hazardous substances that lend themselves to treatment.

(2) To minimize the need for long-term management of contaminated materials, the department expects all hazardous substances will be destroyed, detoxified, and/or removed to concentrations below cleanup levels throughout sites containing small volumes of hazardous substances.

(3) The department recognizes the need to use engineering controls, such as containment, for sites or portions of sites that contain large volumes of materials with relatively low levels of hazardous substances.

(4) To minimize the potential for migration of hazardous substances, the department expects active measures will be taken to prevent precipitation and subsequent runoff from coming into contact with contaminated soils and waste materials.

(5) When hazardous substances remain on-site at concentrations which exceed cleanup levels, those hazardous substances will be consolidated to the maximum extent practicable where needed to minimize the potential for direct contact and migration of hazardous substances.

(6) For facilities adjacent to a surface water body, active measures will be taken to prevent/minimize releases to surface water via surface runoff and ground water discharges in excess of cleanup levels.

(7) Natural attenuation may be appropriate if: source control has been conducted; leaving contaminants on-site during the restoration time frame does not pose a threat to human health and the environment; there is evidence natural biodegradation or chemical degradation is occurring and will continue to occur at a reasonable rate; and, appropriate monitoring requirements are conducted to ensure natural attenuation is occurring.

(8) Cleanup actions will not result in a significantly greater overall threat to human health and the environment.

6.5 Protection After Cleanup

MTCA also provides the following protection after cleanup when hazardous materials remain on Site:

- Institutional Controls. Institutional controls are measures undertaken to limit or prohibit activities that interfere with the integrity of a cleanup action or that may result in exposure to hazardous substances at a site. Institutional controls would also include an environmental covenant to be recorded as part of the property deed to warn future owners of the condition and to restrict activities or use of the property that could result in exposure to the contamination.

- Financial Assurance. Sites using engineered containment systems may be required to post a bond or other financial instrument to guarantee the containment system is maintained as long as the contamination is present at the Site.
- Confirmational Monitoring. Monitoring must be conducted at each site to confirm the long-term effectiveness of the cleanup action once cleanup standards and other performance standards have been attained.
- Periodic Review. Where institutional controls or financial assurances are required, Ecology will conduct a review of the site every five years to ensure the continued protection of human health and the environment. Ecology will also publish a notice of any periodic review in the Site Register and provide an opportunity for public review and comment.

7.0 EVALUATION AND COMPARISON OF ALTERNATIVES

This section provides Ecology's evaluation and comparison of alternatives used to select the cleanup action for the Site that will meet the intent of MTCA.

7.1 Threshold Requirements

Protect human health and the environment

Both Alternative 1 and Alternative 2 are effective in protecting human health and the environment. In both Alternatives, the leaching of the dross constituents in the landfill would be reduced to protect the groundwater and eventually, surface water. Alternative 1 would remove the dross that is the source of the constituents leaching to groundwater while Alternative 2 would use a cap to prevent infiltration of precipitation through the dross that causes the leaching to groundwater.

Comply with cleanup standards

Both alternatives would result in groundwater meeting cleanup standards. Alternative 1 would result in groundwater and surface water meeting cleanup standards and is expected to recover within 2-5 years after the dross is removed. However, the recovery time under Alternative 1 is contingent on how much increased additional leaching of dross constituents occurs during the excavation activities. If the cap under Alternative 2 is proven effective, the quality of groundwater and surface water are expected to be reduced to below the cleanup levels at the points of compliance within 2 – 5 years following cap enhancement.

Comply with Applicable State and Federal Laws

Both alternatives would comply with the applicable and federal laws that are listed in Table 2 of the Final FS. This Table 2 is included as Exhibit B of this document.

Provide for Compliance Monitoring

Both alternatives would provide for compliance monitoring as described under WAC 173-340-410.

7.2 Other Requirements

Use permanent solutions to the maximum extent practicable

A disproportionate cost analysis is required in order to select the most practicable permanent solution is protective of human health and the environment using the following criteria:

- Protectiveness

Both Alternatives provide adequate protection of human health and the environment. Alternative 1 would remove the dross which is the source of leaching to groundwater. Alternative 2 would prevent leaching of contaminants to groundwater through capping. In both alternatives groundwater cleanup levels would be attained through dispersion/dilution once the leaching is addressed. Alternative 1 would involve the disposal of the dross in another landfill where it may cause further problems if not controlled; because of this, the protectiveness of Alternative 2 is slightly higher than Alternative 1. However, institutional controls and other protection requirements would be critical to Alternative 2 to assure the continued integrity of the cap and the remedy.

The overall protectiveness of Alternative 1 is also slightly less than that of Alternative 2 because of the short-term exposure to gases and other short term issues like disturbances to local roadways, noise, dust, increased leaching to groundwater during removal and handling, and the potential for worsened long-term exposure at a new landfill location if the waste is not completely neutralized.

- Permanence

Alternative 1 is a permanent remedy. It reduces the mobility, and volume of the dross at the Site through removal; however, this involves the disposal of the dross to an approved landfill where the materials would have to be managed properly.

In Alternative 2, all of the dross, controlled by a cap would remain. It is not a permanent remedy. Institutional controls and other protection requirements would be required to insure the continued protection of human health and the environment of this remedy.

- Cost

The table below shows the estimated costs for both Alternatives as presented in the Final FS Report.

Summary of Costs for Alternatives 1 and 2

Alternative 1	Cost	Alternative 2	Cost
Cover Removal, Waste Excavation, and Backfilling	$1,769,398.00	Cap Enhancement	$824,089.00
Offsite disposal (including pre-treatment)	$13,895,461.00		
Engineering and Documentation	$220,000.00	Engineering and documentation (including closure report)	$299,500.00
Well Decomissioning	$28,970.00	Well Decomissioning	$28,970.00
		20-year Maintenance (including 5-year reviews) *[20 years is based on the post-closure time frame under WAC 173-304. However, inspections and maintenance will continue after this time frame as long as the dross remains in the landfill.]*	$130,000.00
		Restrictive Covenant	$10,000.00
Compliance Monitoring – Groundwater and Surface Water (5 years)	$147,598	Compliance Monitoring – Groundwater and Surface Water (5 years)	$167,175.00
TOTAL COST	$16,071,427.00 ($20,089, 284 with 25% contingency)		$1,509,734.00 ($1,887,167 with 25% contingency) *[Based on 20 years of maintenance and 5 years of monitoring. Maintenance will continue after the 20 years and additional limited compliance monitoring may continue after the 5 years]*

Alternative 2 includes maintenance costs while Alternative 1 does not. These cost details are found in the Final FS Report.

- Effectiveness over the long term

Alternative 1 provides the highest degree of long-term effectiveness and permanence. However, this alternative would also employ a waste landfill to manage the dross excavated from this Site. Alternative 2 would rely on a cap to control infiltration.

Landfill capping has been proven to be a reliable technology if it is properly maintained. This alternative would rely on institutional controls and other requirements that are critical to ensure the continued effectiveness of this alternative since all of the waste remains under the cap. This would include long-term groundwater monitoring and cap maintenance requirements (mowing, revegetation, and cap repair).

- Management of short-term risks

This is a measure of the risk to human health and the environment during construction and implementation, and the effectiveness of measures would be undertaken to manage such risks

Alternative 2 would rank the highest in terms of short-term effectiveness. This alternative presents the least amount of risk to workers, the community, and the environment. Some particulate emissions from cap installation are anticipated during implementation; however, the dross would not be disturbed so no dross particulates would be released. Dust control methods should easily reduce this risk. Alternative 1 would release ammonia and dross dust particles during excavation activities and during trucking of the dross to an off-site landfill; these emissions may be more difficult to control. In addition, if the landfill would require pre-processing of the dross before it will be accepted, additional ammonia and dross dusts would be emitted. The excavation of the dross would involve the potential of additional leaching of dross materials to groundwater as a result of infiltration of surface water through the dross during removal activities. Other short-term risks that would be associated with Alternative 1 include truck traffic through the narrow roads to transport the dross off-site. There will be limited truck traffic for Alternative 2 but only for a much shorter time in order to haul the capping materials to the Site. Both alternatives will involve some noise. Controls for short-term risks under Alternative 1 would be more difficult to carry out that those under Alternative 2.

The time required to achieve short-term protection would be faster for Alternative 2. It is anticipated that only about 6 months would be required to install a new cap. Alternative 1 would require, depending on the weather, up to two years, before all dross materials will be removed and transported off-Site.

- Technical and administrative implementability

Alternative 2 would be easier and the simplest to implement than Alternative 1 as engineering services and cap materials are readily available. Alternative 1 would be more difficult to implement because of the short-term risks associated with the excavation and off-site trucking and disposal of the dross materials. In addition, there is the uncertainty of whether the materials would be accepted by a permitted landfill. Landfill acceptance and pre-treatment requirements would be determined upon initial testing of the excavated dross. Cost estimates that included pre-treatment were based on the assumption that the dross would be accepted.

- Consideration of public concerns

This DCAP will be made available for public comment.

A summary of the above disproportionate cost analysis is summarized in the table below:

Summary of Disproportionate Cost Analysis

Ranking: 1 (Low) – 5 (High)

Criteria	Alternative 1	Alternative 2
Protectiveness	Leaching of dross constituents to groundwater would be eliminated. Dross materials would be sent to a landfill where it may cause further problems if not controlled. Cleanup levels are expected to be met in 2 to 5 years; however, additional leaching that may occur during the excavation may increase the length of time to attain cleanup levels. **Ranking: 4**	Enhanced cap would prevent leaching of contaminants to groundwater; dross materials will remain in place. Cleanup levels are expected to be met in 2 to 5 years but may be faster than Alternative 1 since there will be no additional leaching expected to occur. Institutional controls would be required for continued protectiveness. **Ranking: 5**
Permanence	Permanent solution since the dross would be removed. **Ranking: 5**	Not a permanent action. The dross would be left in place; institutional controls and other protection requirements would be required. **Ranking: 1**
Cost	The cost for Alternative 1 would be $20,089,284. **Ranking: 1**	The cost for Alternative 2 would be $1,887,167. **Ranking: 5**
Effectiveness over the long term (Degree of certainty that the alternative will be successful)	Provides the greatest certainty as the dross would be removed from the Site. **Ranking: 5**	Certainty of reliability would be dependent on the long-term maintenance to maintain the integrity of the cap. **Ranking: 4**
Management of short-term risks	Short-terms risks include: truck traffic as large quantities of dross materials are hauled off-site and potential increases in vehicular accidents; noise; ammonia vapor and dust emissions during excavation and possibly during transport; and, increased leaching of dross constituents to groundwater once the current cap is removed in preparation for excavation. **Ranking: 1**	Short-term risks include: truck traffic to haul capping materials to the Site, dust emission during grading, and noise. **Ranking: 5**
Technical and Administrative Implementability	Removal project may take one to two years depending on weather conditions. Not very implementable; landfills may not readily accept dross materials and landfills may require the pre-treatment or pre-handling of dross materials before being accepted. There is no available space at the Site for pre-treatment or pre-processing of dross prior to being transported off-site and additional short term risks like dusts, noise, and ammonia vapor missions are likely to be emitted during pre-treatment or pre-processing. Controls for the short-term risks would be difficult to carry out. **Ranking: 3**	Capping of landfill has been proven to be a reliable technology if properly designed and maintained. Project can be completed in less than a year (i.e., during spring and summer months) Very implementable. Controls for short-term risks easier to implement. **Ranking: 5**
Consideration of Public Concerns	This would not address the desire of some members of the community to have the materials removed. **Ranking: 3**	This would address the concerns that some residents close to the Site have on the short-term risks that will result if Alternative 1 is implemented. **Ranking: 3**
Average Ranking	**3.1**	**4.0**

The disproportionate cost analysis shows that the alternative that is permanent to the maximum extent practicable is Alternative 2.

Provide for reasonable restoration time frame

Both alternatives provide for a reasonable restoration time frame. Groundwater cleanup levels are expected to be attained in 2 to 5 years after implementation of the cleanup actions.

Consider public comments

The draft FS Report was made available for public review and comment. This DCAP will be made available for public review and comment prior to finalization.

7.3 Threshold Requirements/Other Criteria Evaluation Summary

	Alternative 1 Waste Removal, Offsite Disposal, Groundwater Dispersion/Dilution, and Compliance Monitoring	Alternative 2 Cap, Enhancement, Institutional Controls, Groundwater Dispersion/Dilution, and Compliance Monitoring
Threshold Criteria		
• Protect Human Health and the Environment	**Yes**	**Yes**
• Comply with Cleanup Standards	**Yes**	**Yes**
• Comply with Applicable State and Federal Laws	**Yes**	**Yes**
• Provide for Compliance Monitoring	**Yes**	**Yes**
Other Requirements		
• Permanent to the Maximum Extent Practicable	Permanent	**Yes**
• Reasonable Restoration Time Frame	**Yes**	**Yes**
• Consider Public Concerns	**Yes**	**Yes**

8.0 SITE CLEANUP ACTION

8.1 Selected Cleanup Action

Both Alternative 1 and Alternative 2 meet all the MTCA threshold criteria. Both alternatives would provide for a reasonable restoration time frame and would also consider public concerns.

The disproportionate cost analysis in Section 7 showed that Alternative 2 is "permanent to the maximum extent practicable". The analysis showed that:

- Controls of short-term risks resulting from the implementation of Alternative 1, which may take up to two years to implement, would be difficult to carry out. Short-term risks associated with Alternative 2 would be much more easily managed and would occur over a shorter period of time.
- The implementation of Alternative 1 would be very heavily dependent on whether a landfill will accept the dross and what pre-treatment or pre-processing would be required. Pre-treatment of the dross would require an area at or near the Site where additional dust and vapor from the dross being processed would also be emitted. Alternative 2 is easier to implement; landfill caps have been shown to be a proven to be a reliable technology if properly designed and maintained.
- The cost of Alternative 1 is very high compared to that of Alternative 2.
- Alternative 1 is a permanent solution but the dross would have to be managed at a permitted landfill. The dross will remain on Site under Alternative 2; however, available controls can be implemented or instituted to ensure the continued protection of the remedy.

In addition, the discussions in the previous section show the two alternatives provide almost the same environmental protection and benefits since both alternatives would reduce the leaching of dross contaminants to groundwater. However, WAC 173-340-360(3)(e)(ii) (c) provides that where two or more alternatives are equal in benefits, the department shall select the less costly alternative provided that all minimum requirements for cleanup actions are met.

Therefore, Ecology's selected action for the Heglar Kronquist Site is Alternative 2, as proposed in the Final FS Report, plus all the protection requirements under MTCA to ensure that this remedy would remain protective.

This selected action will include the following elements:

- Cap enhancement – The enhanced cap is described in the final FS Report and Section 5.2.2 of this Cleanup Action Plan. This multi-layered cap would include a less permeable layer (high-density polyethylene or HDPE), a drainage layer will act as a biological barrier and promote runoff, and 18 inches top soil that would be vegetated with natural grasses at the surface. This would also include modifications to the existing drainage ditches and swales. An **Engineering Design Report**, and a **Construction Plans and Specifications Report** would describe the cap enhancement work in detail.
- Dispersion/Dilution in Groundwater – Following construction of the enhanced cap that would prevent infiltration of surface water and subsequent leaching of dross contaminants to groundwater, the groundwater contaminants – chloride and nitrate – are expected to attenuate via dilution and dispersion to levels below the cleanup criteria.
- Compliance Monitoring –
  - Protection Monitoring – Monitoring during installation would be conducted to confirm human health and the environment are adequately protected during the cap enhancement and would be described in a **Health and Safety Plan.**
  - Performance Monitoring – Monitoring of groundwater would be performed on identified compliance monitoring wells to confirm the cleanup action is performing as expected and groundwater cleanup levels will or have been attained. After the installation of the enhanced cap, limited air sampling for ammonia will be conducted to confirm ammonia production in the dross has declined due to the reduction or absence of moisture under the cap. This monitoring would be described in a **Compliance Monitoring Plan**.
  - Confirmational monitoring – This is to confirm the long-term effectiveness of the cleanup action, once cleanup levels are attained. This continued monitoring would be determined during periodic reviews or as conditions dictate at the Site.
- Institutional Controls - These are critical measures that would be undertaken to limit or prohibit activities in order to assure the continued effectiveness of the cleanup action. These will include:

  (a) Fencing around the landfill property.

(b) Restrictions to limit use of the property. This would be in the form of an Environmental Covenant that must be recorded as part of the property deed to warn future owners of the condition of the Site and to restrict activities that will result in compromising the integrity of the cap. Restriction on the use of groundwater near the vicinity of the Site is not necessary because WAC 173-160-171 prohibits installation of new water wells, other than for public water supply, within 1,000 ft from the landfill property. This 1,000-ft setback area from the landfill property is shown in Exhibit C. The landfill property is determined to be Parcel 1 as described in Appendix A.

(c) Maintenance requirements for the cap including inspections and maintenance of the cap, and maintenance of compliance monitoring wells.

(d) Signage.

(e) Financial assurance. A bond, financial test, or other financial instrument to guarantee the cap is maintained as long as the dross remains on site will be required.

All these controls will be described in an **Institutional Controls Plan**.

- Periodic Review

Ecology will conduct a review of the Site every five years to ensure the continued protection of human health and the environment. If the cap system is not proven to be effective during a review, other remedial options including the dross removal and off-site disposal will be revisited.

8.2 Evaluation of the Cleanup Action with Respect to MTCA Criteria

8.2.1 Threshold Requirements

Protect human health and the environment

The selected cleanup action is protective of human health and the environment. The institutional controls, along with the periodic review, would ensure continued effectiveness of the cleanup action.

Comply with cleanup standards

Groundwater cleanup levels are expected to attain cleanup levels within 2 to 5 years.

Comply with applicable state and federal law

The selected cleanup action would comply with the ARARs identified under Alternative 2 in Appendix B.

Provide for compliance monitoring

The selected cleanup action would provide for compliance monitoring.

8.2.2 Other Requirements

Use permanent solutions to the maximum extent practicable

The selected cleanup action is permanent to the maximum extent practicable.

Provide for reasonable restoration time frame

The selected cleanup action provides for a restoration time frame. Groundwater cleanup levels are expected to be attained within 2 to 5 years.

Consider public concerns

Public concerns on the selected remedy will be addressed during the public review and comment period for the DCAP.

8.2.3 Expectations for Cleanup Action Alternatives

The selected cleanup action involves containment in the form of the landfill cap.

8.3 Implementation Schedule

The implementation schedule for the cleanup actions has not been determined at this time. This DCAP will be made available for public review and comment. Ecology will then issue a FCAP after public comments are addressed. The next step would be Kaiser and Ecology starting negotiations leading to a legal document (Consent Decree or Agreed Order) that will require implementation of the cleanup actions.

Submittal of the following documents for Ecology's review and approval will be required in accordance with the negotiated schedule in the Consent Decree or Agreed Order:

Engineering Design Report

Compliance Monitoring Plan

Institutional Control Plan

Health and Safety Plan

The **Construction Plans and Specifications, and the Operation and Maintenance Plan** will be submitted according to a schedule approved in the final Engineering Design Report. Implementation of this cleanup action is expected in 2013. A cleanup action report will be submitted no later than 3 months after completion of the cleanup action.

10.0 REFERENCES

Exponent, September 9, 2011, Final Remedial Investigation Report, Heglar Kronquist Landfill, Mead, Washington.

Exponent, May 2012, Final Feasibility Study Report, Heglar Kronquist Site, Mead, Washington.

APPENDIX A

STATUTORY WARRANTY DEEDS (LANDFILL PROPERTY AND ADJACENT PROPERTIES)

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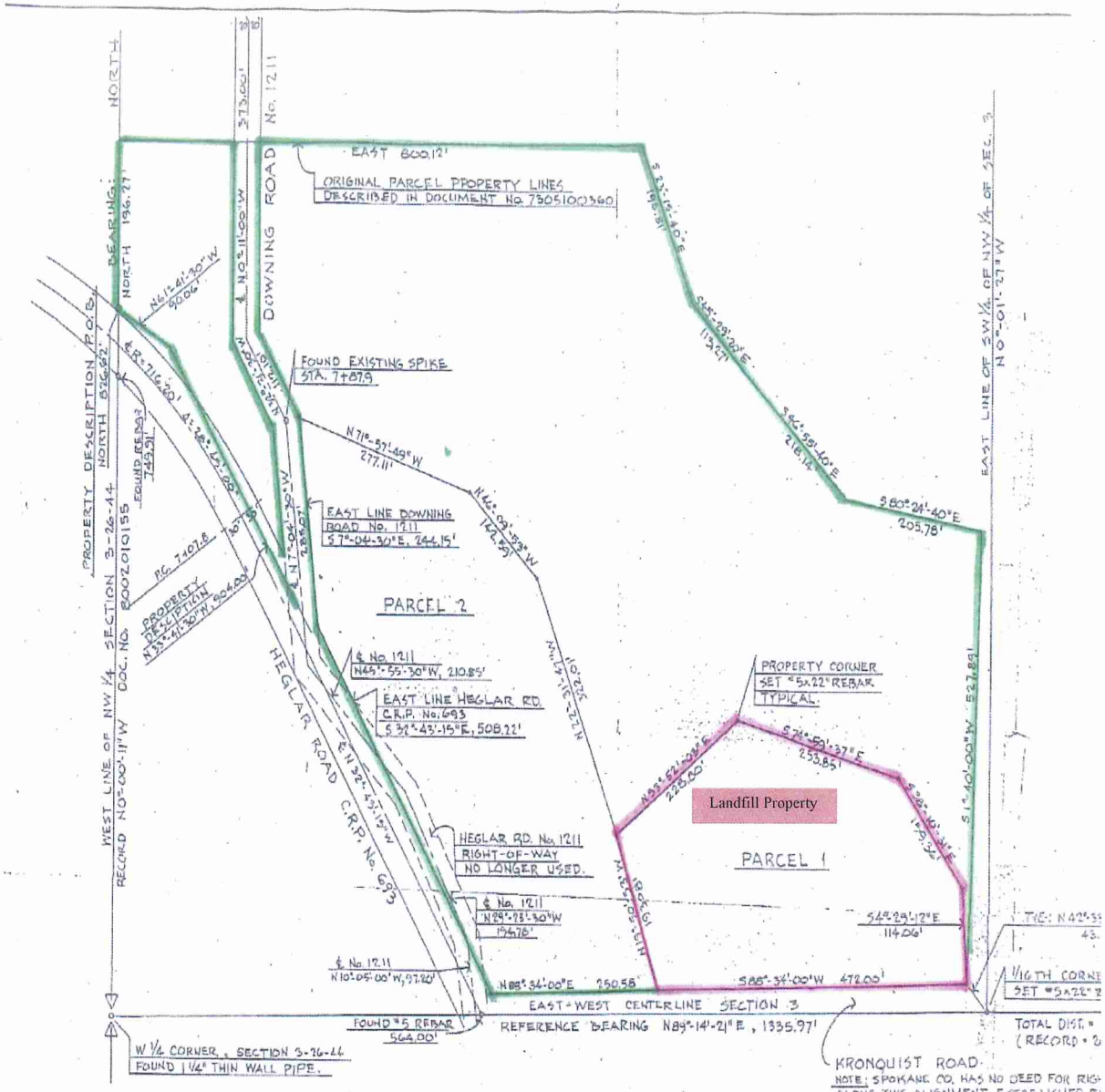

DESCRIPTIONS:

THAT PORTION OF THE SOUTHWEST QUARTER OF THE NORTHWEST QUARTER OF SECTION 3, TOWNSHIP 26 NORTH, RANGE 44 EAST OF THE WILLAMETTE MERIDIAN IN SPOKANE COUNTY, WASHINGTON DESCRIBED AS FOLLOWS:

PARCEL 1. - Commencing at the Southeast Corner of the SW 1/4 of the NW 1/4 of Section 3, T 26 N, R 44 E.W.M.; thence N 42°-33'-25" W, 43.68 ft to the TRUE POINT OF BEGINNING and the Southeasterly Property Corner of the Parcel described in Spokane County Auditor's Document No. 7305100360; thence S 88°-34'-00" W, along the South Line of the Parcel described in said Document, 472.00 ft; thence N 19°-50'-53" W, 193.08 ft; thence N 53°-52'-03" E, 220.80 ft, thence S 74°-59'-37" E, 253.85 ft; thence S 38°-10'-31" E, 159.36 ft; thence S 4°-29'-12" E, 114.06 ft to the True Point of Beginning.

Contains: 2.89 Acres More or Less.

PARCEL 2. - Commencing at the Southeast Corner of the SW 1/4 of the NW 1/4 of Section 3, T 26 N, R 44 E.W.M.; thence N 42°-33'-25" W, 43.68 ft to the Southeasterly Property Corner of the Parcel described in Spokane County Auditor's Document No. 7305100360; thence S 88°-34'-00" W, along the South Line of the Parcel described in said Document, 472.00 ft to the TRUE POINT OF BEGINNING; thence N 19°-50'-53" W, 193.08 ft; thence N 22°-31'-47" W, 322.01 ft; thence N 46°-09'-53" W, 142.59 ft; thence N 71°-57'-49" W, 277.11 ft to a point on the East Line of Downing Road, No. 1211, at Angle Point Station 7+87.9; thence S 7°-04'-30" E, along the East Line of Downing Road, No. 1211, 244.15 ft to a point on the Northeasterly Line of Heglar Road, C.R.P. No. 693; thence S 32°-43'-15" E, along the Northeasterly Line of Heglar Road, C.R.P. No. 693, 508.22 ft to a point on the South Line of the Parcel described in Spokane County Auditor's Document No. 7305100360; thence N 88°-34'-00" E, 250.58 ft to the True Point of Beginning.

Contains: 4.41 Acres More or Less. Includes Heglar Road, No. 1211, Right-of-Way that is no longer being used.

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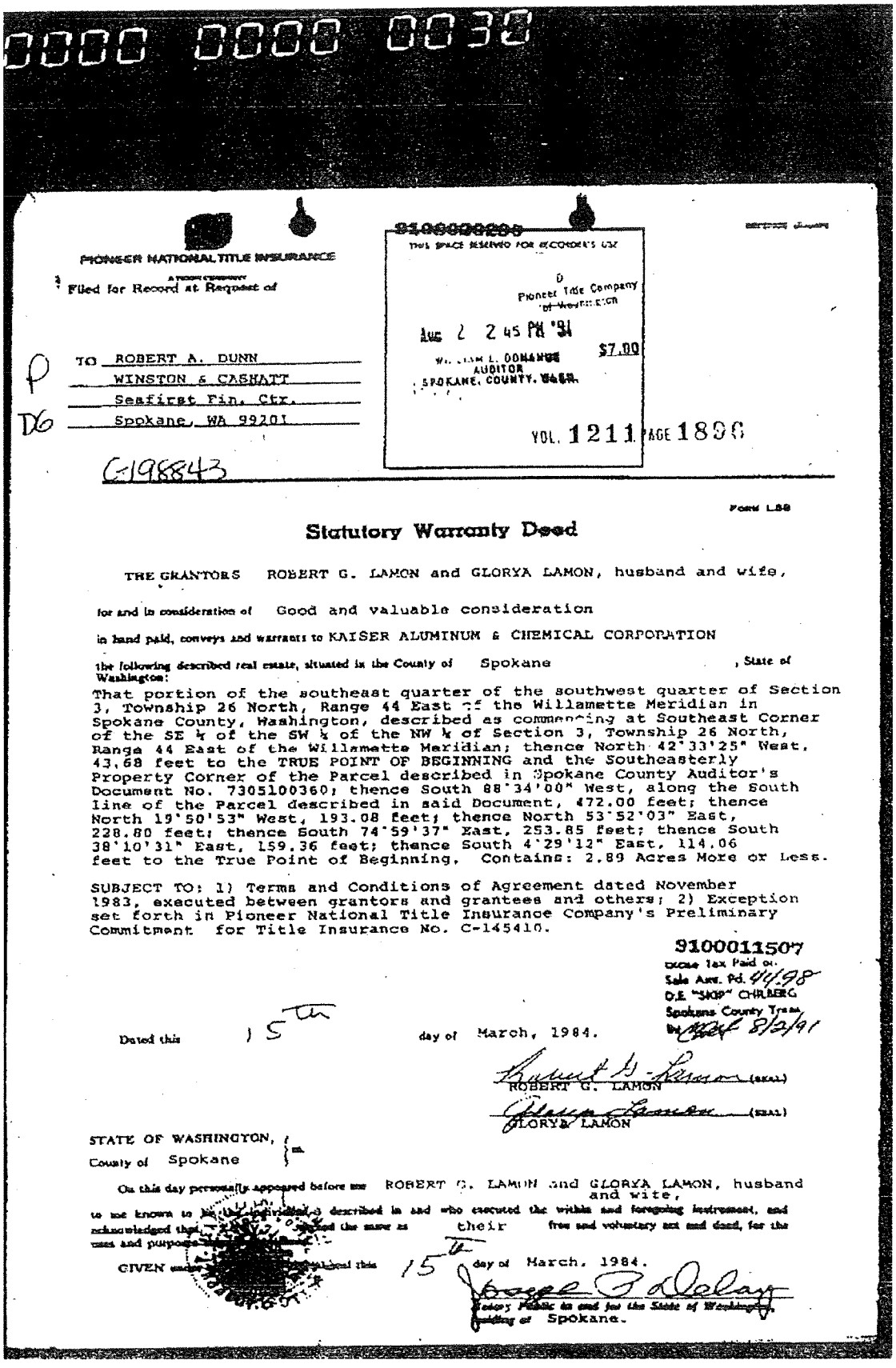


0000 0000 0038

PIONEER NATIONAL TITLE INSURANCE
A [illegible] COMPANY
Filed for Record at Request of

TO ROBERT A. DUNN
WINSTON & CASHATT
Seafirst Fin. Ctr.
Spokane, WA 99201

G-198843

9100000200
THIS SPACE RESERVED FOR RECORDER'S USE

Pioneer Title Company
of Washington

AUG 2 2 45 PM '91

WILLIAM L. DONAHUE
AUDITOR
SPOKANE COUNTY, WASH.

$7.00

VOL. 1211 PAGE 1896

Form L88

Statutory Warranty Deed

THE GRANTORS ROBERT G. LAMON and GLORYA LAMON, husband and wife,

for and in consideration of Good and valuable consideration

in hand paid, conveys and warrants to KAISER ALUMINUM & CHEMICAL CORPORATION

the following described real estate, situated in the County of Spokane, State of Washington:

That portion of the southeast quarter of the southwest quarter of Section 3, Township 26 North, Range 44 East of the Willamette Meridian in Spokane County, Washington, described as commencing at Southeast Corner of the SE ¼ of the SW ¼ of the NW ¼ of Section 3, Township 26 North, Range 44 East of the Willamette Meridian; thence North 42°33'25" West, 43.68 feet to the TRUE POINT OF BEGINNING and the Southeasterly Property Corner of the Parcel described in Spokane County Auditor's Document No. 7305100360; thence South 88°34'00" West, along the South line of the Parcel described in said Document, 472.00 feet; thence North 19°50'53" West, 193.08 feet; thence North 53°52'03" East, 228.80 feet; thence South 74°59'37" East, 253.85 feet; thence South 38°10'31" East, 159.36 feet; thence South 4°29'12" East, 114.06 feet to the True Point of Beginning. Contains: 2.89 Acres More or Less.

SUBJECT TO: 1) Terms and Conditions of Agreement dated November 1983, executed between grantors and grantees and others; 2) Exception set forth in Pioneer National Title Insurance Company's Preliminary Commitment for Title Insurance No. C-145410.

9100011507
Excise Tax Paid on
Sale Amt. Pd. 44.98
D.E. "SKIP" CHRISTENSEN
Spokane County Treas.
By [illegible] 8/2/91

Dated this 15th day of March, 1984.

ROBERT G. LAMON (SEAL)

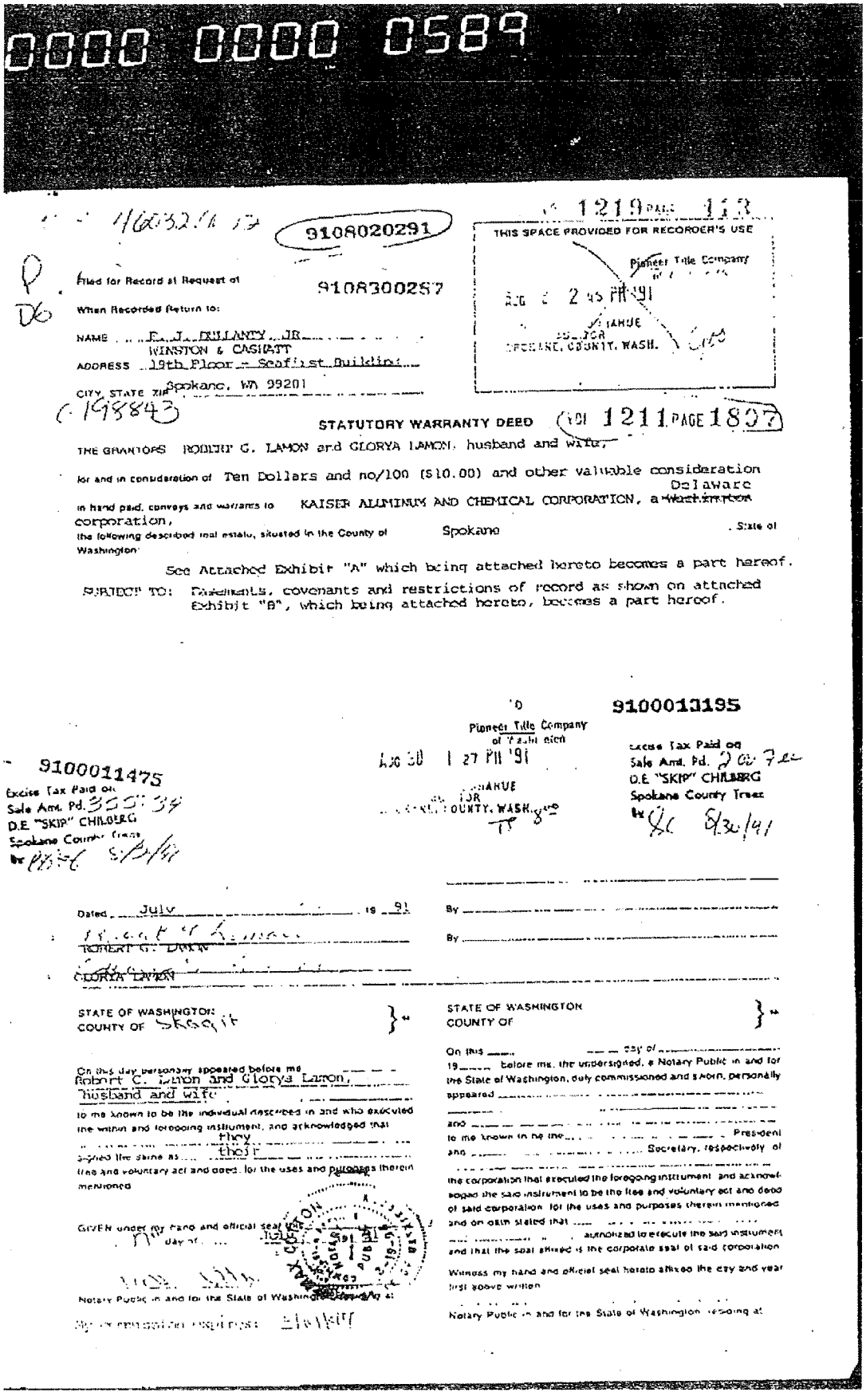
GLORYA LAMON (SEAL)

STATE OF WASHINGTON, } ss.
County of Spokane }

On this day personally appeared before me ROBERT G. LAMON and GLORYA LAMON, husband and wife, to me known to be the individual described in and who executed the within and foregoing instrument, and acknowledged that they signed the same as their free and voluntary act and deed, for the uses and purposes therein mentioned.

GIVEN under my hand and official seal this 15th day of March, 1984.

Notary Public in and for the State of Washington, residing at Spokane.



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1219 PAGE 113

9108020291

THIS SPACE PROVIDED FOR RECORDER'S USE

Pioneer Title Company

AUG 2 2 45 PM '91

REVENUE
FOR
SPOKANE COUNTY, WASH.

Filed for Record at Request of 9108300257

When Recorded Return to:

NAME E. J. DELLANTY, JR.
WINSTON & CASHATT
ADDRESS 19th Floor - Seafirst Building
CITY, STATE ZIP Spokane, WA 99201

C-198843

STATUTORY WARRANTY DEED 1211 PAGE 1897

THE GRANTORS ROBERT G. LAMON and GLORYA LAMON, husband and wife,

for and in consideration of Ten Dollars and no/100 ($10.00) and other valuable consideration

in hand paid, conveys and warrants to KAISER ALUMINUM AND CHEMICAL CORPORATION, a ~~Washington~~ Delaware corporation,

the following described real estate, situated in the County of Spokane, State of Washington:

See Attached Exhibit "A" which being attached hereto becomes a part hereof.

SUBJECT TO: Easements, covenants and restrictions of record as shown on attached Exhibit "B", which being attached hereto, becomes a part hereof.

9100011475

Excise Tax Paid on
Sale Amt. Pd. 355.34
D.E. "SKIP" CHILBERG
Spokane County Treas.
By [illegible] 8/29/91

9100011195

Pioneer Title Company
of Washington

AUG 30 1 27 PM '91

REVENUE
FOR
SPOKANE COUNTY, WASH.

Excise Tax Paid on
Sale Amt. Pd. 2 00 Fee
D.E. "SKIP" CHILBERG
Spokane County Treas.
By [illegible] 8/30/91

Dated July 19 91

ROBERT G. LAMON

GLORYA LAMON

By _____

By _____

STATE OF WASHINGTON
COUNTY OF Spokane } ss.

On this day personally appeared before me Robert G. Lamon and Glorya Lamon, husband and wife to me known to be the individual described in and who executed the within and foregoing instrument, and acknowledged that they signed the same as their free and voluntary act and deed, for the uses and purposes therein mentioned.

GIVEN under my hand and official seal this 27th day of July, 1991.

Notary Public in and for the State of Washington residing at [illegible]

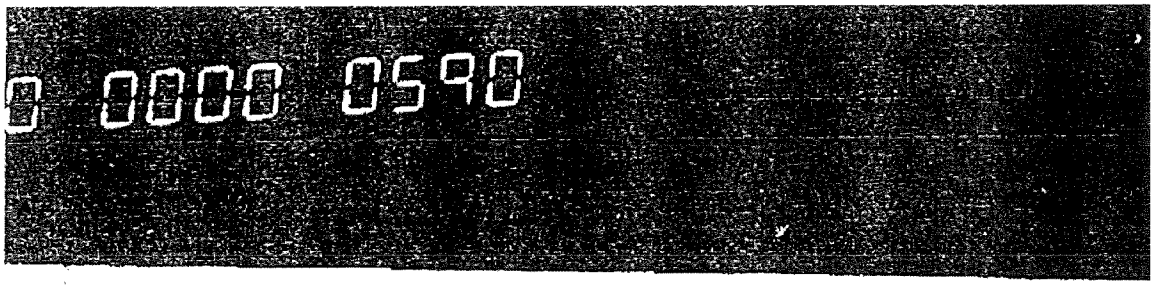
My commission expires: [illegible]

STATE OF WASHINGTON
COUNTY OF } ss.

On this ____ day of _____, 19____, before me, the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared _____ and _____ to me known to be the _____ President and _____ Secretary, respectively of the corporation that executed the foregoing instrument, and acknowledged the said instrument to be the free and voluntary act and deed of said corporation for the uses and purposes therein mentioned and on oath stated that _____ authorized to execute the said instrument and that the seal affixed is the corporate seal of said corporation.

Witness my hand and official seal hereto affixed the day and year first above written.

Notary Public in and for the State of Washington residing at



VOL. 1219 PAGE 414

VOL. 1211 PAGE 1898

EXHIBIT "A"

That portion of the Southwest quarter of the Northwest quarter of Section 3, Township 26 North, Range 44 East, W.M., in Spokane County, Washington, which is bounded by a line described as follows:

Beginning at the Southwest corner of said Southwest quarter of the Northwest quarter of said Section 3; thence North along the West boundary of said Southwest quarter of the Northwest quarter, 826.62 feet to the true point of beginning; thence North, 196.27 feet; thence East, 300.12 feet; thence South 23°15'40" East, 198.81 feet; thence South 45°29'20" East, 113.27 feet; thence South 46°55'40" East, 218.14 feet; thence South 80°24'40" East, 205.78 feet; thence South 1°40'00" West, 527.89 feet; thence South 68°34'00" West, 729.55 feet; thence North 33°41'30" West, 904.00 feet; thence North 61°41'30" West, 90.06 feet to the true point of beginning,

EXCEPT that portion conveyed to Spokane County for Downing Road and other roads.

AND EXCEPT that portion deeded to Spokane County by Treasurers Deed recorded under Auditor's File No. 8810200232.

AND EXCEPT:

That portion of the southeast quarter of the southwest quarter of Section 3, Township 26 North, Range 44 East of the Willamette Meridian in Spokane County, Washington, described as commencing at Southeast Corner of the SE ¼ of the SW ¼ of the NW ¼ of Section 3, Township 26 North, Range 44 East of the Willamette Meridian; thence North 42°33'25" West, 43.68 feet to the TRUE POINT OF BEGINNING and the Southeasterly Property Corner of the Parcel described in Spokane County Auditor's Document No. 7305100360; thence South 88°34'00" West, along the South line of the Parcel described in said Document, 472.00 feet; thence North 19°50'53" West, 193.06 feet; thence North 53°52'03" East, 228.80 feet; thence South 74°59'37" East, 253.85 feet; thence South 38°10'31" East, 159.36 feet; thence South 4°29'12" East, 114.06 feet to the True Point of Beginning.

VOL. 1211 PAGE 1899

Exhibit "B"

VOL. 1219 PAGE 417

1. A perpetual easement for one or more electric power transmission lines granted to the United States of America, together with the right to clear said land and to keep same clear of brush, timber, structures, and fire hazards.
   Width : 100 feet. The boundaries of said strip of land lie 50 feet distant from, on each side of, and parallel with the survey line for the Green Bluff Tap to the Bell-Trentwood Nos. 1 and 2 transmission lines, as now located and staked
   Recorded : June 18, 1964
   Auditor's No. : 26649C
   Affects : Said premises and other property

   *Copy of easement furnished upon request.

2. An easement affecting the portion of said premises and for the purposes stated herein, and incidental purposes.
   For : The right to place, construct, operate and maintain, underground communication lines, with appurtenances attached, upon, across, over and/or under that portion of Heglar Road proposed for vacation under the Spokane County Road Engineers File 1211, lying within the Southwest quarter of the Northwest quarter of Section 3. Said telephone plant is to be kept as and where the same is now located on said land now constituting part of said road. Right of full and free ingress to and egress from said property.
   In Favor of : Pacific Northwest Bell Telephone Company, a Washington corporation
   Dated : March 5, 1976
   Recorded : April 30, 1976
   Auditor's No. : 7604300017

4. Property Damage Release and Servitude
   Recorded : February 2, 1990
   Auditor's No. : 9002020131

   Robert G. Lamon and Glorya Lamon, husband and wife, FULLY AND FOREVER RELEASE, ACQUIT AND DISCHARGE Kaiser Aluminum and Chemical Corporation, and KACC's subsidiaries and affiliates, from all claims or remedies on account of property damage, if any, to First Parties' property, which may presently exist or which hereafter may directly or indirectly arise or directly or indirectly accrue on account of the past, present or future continuing existence of pollutants (including all chemical constituents of dross waste material located on the property). This Agreement constitutes a permanent servitude which is and shall continue to be appurtenant to and incident to the land described.

APPENDIX B

TABLE OF ARARS

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Table 2. Summary of ARARS—Heglar Kronquist Landfill, Mead, Washington

ARARs	Alternative 1 – Waste Removal, Offsite Disposal, Dispersion/ Dilution, and Compliance Monitoring	Alternative 2 –Cap Enhancement, Institutional Controls, Dispersion/ Dilution, and Compliance Monitoring	Comments
Local Laws			
SCC Title 3, Section 3.10.020 Grading	X	X	Grading activities must comply with this ordinance.
SCC Title 6, Chapter 6.12 Noise Disturbances	Possible	Possible	Work activities must comply with this ordinance. May be needed, depending on work activities, work area and distance to residential properties.
SCC Title 8 Health and Sanitation	X	Not applicable	Waste disposal must comply with this ordinance.
SCC Title 9, Chapter 9.40 Encroachments and Work Within Public Right-of-Way	Possible	Possible	May be needed, depending on location of the work area.
SCC Title 46 Motor Vehicles	X	X	Use of motor vehicles, such as size, weight, and load, must comply with this ordinance.
State Laws			
WAC 173-340 MTCA – Cleanup Regulation	X	X	The remedial action will be conducted under MTCA. Therefore, all remedial alternatives must comply with MTCA.
WAC 173-162 Regulation and Licensing of Well Contractors and Operators	X	X	As part of Alternatives 1 and 2, two monitor wells on the landfill will be decommissioned in accordance with WAC 173-162. If the monitor well network is decommissioned in the future, this decommissioning must also be in compliance with WAC 173-162.
WAC 173-303 Dangerous Waste Regulations	Not applicable	Not applicable	Black dross is not a dangerous waste, therefore, this ARAR is not applicable.
WAC 173–304 Minimum Functional Standards for Solid Waste Handling	Not applicable	Not applicable	The landfill was operated and closed prior 1985, when the standards in WAC 173-304 were promulgated. Therefore, compliance with WAC 173-304 is not required. Rather, this work would be designed and completed in substantive compliance with the overall purpose of WAC 173-304 "to protect public health, to prevent land, air and water pollution, and conserve the state's natural, economic, and energy resources."
WAC 173-350 Solid Waste Handling Standards	X	Not applicable	As noted above, substantive compliance with the overall purpose of WAC 173-304 is applicable, however, compliance with WAC 173-304 and WAC 173-350, both promulgated after the landfill was operated and closed, are not applicable. Solid waste handling standards apply to disposal of dross for Alternative 1.

Table 2. Summary of ARARS—Heglar Kronquist Landfill, Mead, Washington

ARARs	Alternative 1 – Waste Removal, Offsite Disposal, Dispersion/ Dilution, and Compliance Monitoring	Alternative 2 –Cap Enhancement, Institutional Controls, Dispersion/ Dilution, and Compliance Monitoring	Comments
State Laws (cont.)			
WAC 197-11, WAC 173-802 State Environmental Policy Act (SEPA)	X	X	A SEPA review is required for all proposals with probable significant adverse impacts on the quality of the environment. Ecology will conduct a SEPA review during the RI/FS process.
WAC 173-201A Water Quality Standards for Surface Waters	X	X	MTCA requires that cleanup actions comply with applicable standards.
Federal Laws			
40 CFR 141 National Primary Drinking Water Regulations	X	X	MTCA requires that cleanup actions comply with applicable standards.
40 CFR 260-268 Resource Conservation and Recovery Act	Not applicable	Not applicable	Black dross is not a hazardous waste, therefore, this ARAR is not applicable.
33 USC 1251 et. Seq. Federal Water Pollution Control Act (aka Clean Water Act)	X	X	MTCA requires that cleanup actions comply with applicable standards.
40 CFR 131 National Toxics Rule	X	X	MTCA requires that cleanup actions comply with applicable standards.

Note: ARAR - applicable or relevant and appropriate requirement
CFR - Code of Federal Regulations
MTCA - Model Toxics Control Act
SEPA - State Environmental Policy Act
SCC - Spokane County Code
WAC - Washington Administrative Code

APPENDIX C

1000- FT BUFFER FROM PARCEL 1