

January 25, 2018

Diana Washington, P.E.  
Water Quality Program  
Washington Department of Ecology  
4601 North Monroe Street  
Spokane, Washington 99205

**Subject: Response to Compliance Inspection Report – NPDES Permit No. WA0045586  
Lehigh Cement Company Closed Cement Kiln Dust Pile Site  
Metaline Falls, Washington**

Dear Diana:

Geosyntec Consultants has prepared this letter on behalf of the Lehigh Cement Company (Lehigh). We received your Compliance Inspection letter dated October 30, 2017 for the Lehigh Cement Company Closed Cement Kiln Dust (CKD) site in Metaline Falls (the Site).

As outlined in NPDES Permit No. WA0045586, the current effluent discharge limits for the groundwater treatment system at the Site, are:

Total arsenic	5 µg/L
Total chromium	10 µg/L
Total lead	5 µg/L
Total manganese	2,240 µg/L

The Compliance Inspection letter states that the current permit limits for these constituents may be revised. It also states the total manganese limit of 2,240 µg/L should be 50 µg/L.

Please note that the current discharge limits were established in Consent Decree No. 06-2-00034-6 between the Washington Department of Ecology and Lehigh, signed on February 28, 2006. The Cleanup Action Plan (CAP), included as Exhibit B to the Consent Decree, summarizes the cleanup standard development process in Section 5.2 (see page 14 of the CAP) and identifies the above values as the discharge limits. The limits were extensively evaluated by the Department of Ecology and the manganese limit corresponding to an aesthetic maximum contaminant levels (MCL) for drinking water was recognized as inappropriate for this discharge.

In Section 5.2, the CAP also states:

“The manganese cleanup level will be established using the Method B cleanup level for non-carcinogenic contaminants, which sets the manganese concentration at 2,240 µg/L for protection of human health.”

Therefore, it is our understanding that the limits established in the Consent Decree are the applicable and binding discharge limits.

Sincerely,  
Geosyntec Consultants, Inc.



Brian Petty, P.E.  
Senior Principal

Copies to:  
Tim Matz, Lehigh Hanson, Inc.

Attachments:  
Consent Decree No. 06-2-00034-6

**STATE OF WASHINGTON  
PEND OREILLE COUNTY SUPERIOR COURT**

STATE OF WASHINGTON,  
DEPARTMENT OF ECOLOGY,

Plaintiff,

v.

LEHIGH CEMENT COMPANY,

Defendant.

NO.

CONSENT DECREE

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Exhibit A - Site Diagrams

- Figure A-1 (Site Diagram Overview)
- Figure A-2 (Site Diagram Features)

Exhibit B - Cleanup Action Plan

- Figure 1 (Site Location Map)
- Figure 2 (Site Diagram Features)
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- Figure 7 (Alternative 5)
- Figure 8 (Alternative 6)
- Table 1 (Indicator Substance Screening)
- Table 2 (Method B Cleanup Level Development)
- Table 3 (Hazard Index and Cleanup Levels)
- Table 4 (Applicable Relevant and Appropriate Requirements)

Exhibit C - Scope of Work and Schedule

Exhibit D - Public Participation Plan

- Appendix A (Site Diagram Overview)
- Appendix B (Mailing List)
- Appendix C (Glossary)

Exhibit E - Ground Water Sampling Data Submittal Requirements

Exhibit F - Restrictive Covenant (Declaration of Covenant)

- Attachment A (Legal Description)
- Attachment B (As-built Drawings)
- Attachment C (Operations and Maintenance Plan)

Exhibit G - Post-Closure Care and Maintenance Plan

- Appendix A (Survey Plat and Plan)



## I. INTRODUCTION

A. In entering into this Consent Decree (Decree), the mutual objective of the Washington State Department of Ecology (Ecology) and Lehigh Cement Company (Lehigh) is to provide for remedial action at a facility where there has been a release or threatened release of hazardous substances. This Decree requires Lehigh to undertake the following remedial action(s) at the Lehigh Cement Company Closed Cement Kiln Dust (CKD) Pile Site (Site) (see Exhibit A):

(1) Install, operate and maintain an in-situ groundwater treatment system east of the Closed Cement Kiln Dust (CKD) Pile between Highway 31 and Sullivan Creek. The treatment system will consist of a hydraulic barrier that intercepts contaminated groundwater and directs it toward a treatment corridor. The treatment corridor will contain silicone tubes suspended within perforated plastic piping. Carbon dioxide will diffuse through the silicone tubing resulting in carbonic acid production, which will lower the pH. This, in turn, will decrease concentrations of metals in groundwater. Concentrations of arsenic, lead, chromium, and manganese and levels of pH in the groundwater exceed MTCA cleanup levels.

(2) Install, operate, and maintain a gravity drain along the southern edge of the Closed CKD Pile. The drain will intercept groundwater and redirect it away from the Closed CKD Pile. The intercepted water will be routed in the subsurface to an area south of the hydraulic barrier, unless it exceeds cleanup levels and requires treatment.

(3) Provide for groundwater monitoring in accordance with the Compliance Monitoring Plan approved by Ecology.

(4) Provide for and maintain institutional controls in the form of restrictive covenants, fences, and signs.

(5) Provide for the operation and maintenance of the cover and stormwater system for the Closed CKD Pile.

1 Ecology has determined that these actions are necessary to protect human health and  
2 the environment.

3 B. The Complaint in this action is being filed simultaneously with this Decree.  
4 An Answer has not been filed, and there has not been a trial on any issue of fact or law in this  
5 case. However, the Parties wish to resolve the issues raised by Ecology's Complaint. In  
6 addition, the Parties agree that settlement of these matters without litigation is reasonable and  
7 in the public interest, and that entry of this Decree is the most appropriate means of resolving  
8 these matters.

9 C. In signing this Decree, the Parties agree to its entry and agree to be bound by its  
10 terms.

11 D. By entering into this Decree, the Parties do not intend to discharge non-settling  
12 Parties from any liability they may have with respect to matters alleged in the Complaint. The  
13 Parties retain the right to seek reimbursement, in whole or in part, from any other liable  
14 persons for sums expended under this Decree.

15 E. The requirements of this Decree will concurrently satisfy Lehigh's obligations  
16 for corrective action, as set forth in WAC 173-303-64620 (including financial assurance for  
17 corrective action). Lehigh has previously taken action to satisfy requirements for post-closure  
18 care, as set forth in WAC 173-303-400(3), incorporating by reference 40 C.F.R. § 265.117  
19 through 265.119, as well as in WAC 173-303-400(3)(c)(vi) and WAC 173-303-620(5) and (6).  
20 The requirements of this Decree continue to satisfy Lehigh's obligations for post-closure care.

21 F. This Decree shall not be construed as proof of liability or responsibility for any  
22 releases of hazardous substances or cost for remedial action nor an admission of any facts;  
23 provided, however, that Lehigh shall not challenge the authority of the Attorney General and  
24 Ecology to enforce this Decree.

25 G. The Court is fully advised of the reasons for entry of this Decree, and good  
26 cause having been shown:

1 Now, therefore, it is HEREBY ORDERED, ADJUDGED, AND DECREED as follows:

2 **II. JURISDICTION**

3 A. This Court has jurisdiction over the subject matter and over the Parties pursuant  
4 to Chapter 70.105D RCW, the Model Toxics Control Act (MTCA).

5 B. Authority is conferred upon the Washington State Attorney General by RCW  
6 70.105D.040(4)(a) to agree to a settlement with any potentially liable person if, after public  
7 notice and any required hearing, Ecology finds the proposed settlement would lead to a more  
8 expeditious cleanup of hazardous substances. RCW 70.105D.040(4)(b) requires that such a  
9 settlement be entered as a Consent Decree issued by a court of competent jurisdiction.

10 C. Ecology has determined that a release or threatened release of hazardous  
11 substances has occurred at the Site.

12 D. Ecology has given notice to Lehigh of Ecology's determination that Lehigh is a  
13 potentially liable person for the Site, as required by RCW 70.105D.020(16) and WAC  
14 173-340-500.

15 E. The actions to be taken pursuant to this Decree are necessary to protect public  
16 health and the environment.

17 F. This Decree has been subject to public notice and comment.

18 G. Ecology finds that this Decree will lead to a more expeditious cleanup of  
19 hazardous substances at the Site in compliance with the cleanup standards established under  
20 RCW 70.105D.030(2)(e) and Chapter 173-340 WAC.

21 H. Lehigh has agreed to undertake the actions specified in this Decree and consents  
22 to the entry of this Decree under MTCA.

23 **III. PARTIES BOUND**

24 This Decree shall apply to and be binding upon the Parties to this Decree, their  
25 successors, and assigns. The undersigned representative of each party hereby certifies that he  
26 or she is fully authorized to enter into this Decree and to execute and legally bind such party to

1 comply with the Decree. Lehigh agrees to undertake all actions required by the terms and  
2 conditions of this Decree. No change in ownership or corporate status shall alter Lehigh's  
3 responsibility under this Decree. Lehigh shall provide a copy of this Decree to all agents,  
4 contractors, and subcontractors retained to perform work required by this Decree. Lehigh shall  
5 use best efforts to ensure that all work undertaken by such agents, contractors, and  
6 subcontractors complies with this Decree, with the understanding that Lehigh is responsible for  
7 compliance with this Decree.

#### 8 **IV. DEFINITIONS**

9 Except as specified herein, all definitions in RCW 70.105D.020 and WAC 173-340-200  
10 apply to the terms in this Decree.

11 A. Site: The Site, referred to as the Lehigh Cement Company Closed Cement Kiln  
12 Dust Pile Site, is generally located in the southeast quarter of Section 21, Township 39 North,  
13 Range 43 East, Willamette Meridian (approximately Milepost 14.67 on Washington State  
14 Route 31) near the town of Metaline Falls, Washington. The Site is more particularly  
15 described in Exhibit A to this Decree, which includes a detailed Site diagram. The Site  
16 constitutes a "facility" under RCW 70.105D.020(4).

17 B. Parties: Refers to the Washington State Department of Ecology and Lehigh  
18 Cement Company.

19 C. Defendant: Refers to Lehigh Cement Company.

20 D. Consent Decree or Decree: Refers to this Consent Decree and each of the  
21 exhibits to the Decree. All exhibits are integral and enforceable parts of this Consent Decree.  
22 The terms "Consent Decree" or "Decree" shall include all exhibits to the Consent Decree.

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1. Lehigh owned and operated the Metaline Falls cement plant from 1914 until 1989. From the early 1950s through 1989, cement kiln dust (CKD), a byproduct from the production of Portland cement, was disposed in an on-site landfill (also referred to herein as the CKD pile) located in the southeast quarter of Section 21, Township 39 North, Range 43 East, Willamette Meridian (WM) (see Exhibit A). In 1989, Lehigh sold the cement plant and surrounding land to the Lafarge Corporation. Lehigh retained ownership of the CKD landfill. Evidence of Lehigh's ownership of the landfill and the company's disposal of CKD to the landfill is contained in the following documents:

2. Lehigh owned and operated the CKD landfill as a dangerous waste facility after 1984, when CKD became subject to regulation under the amended Hazardous Waste Management Act (Chapter 70.105 RCW) and its implementing Dangerous Waste Regulations (Chapter 173-303 WAC).

3. Prior to 1984, CKD was exempt from regulation as a hazardous or dangerous waste by both the federal government and the State of Washington. In 1984, the CKD exemption was withdrawn by the state. CKD is currently still exempt from the federal hazardous waste regulations [40 CFR 261.4(b)(8)].

1           4.       On November 16, 1984, Lehigh submitted a "Notification of Dangerous Waste  
2 Activities" (Form 2) to notify Ecology that Lehigh would be generating and disposing  
3 dangerous waste (CKD) at the Meteline Falls cement plant.

4           5.       Pursuant to the November 16, 1984 notification, Lehigh was issued EPA/State  
5 identification number WAD 009063116. When Lehigh sold the cement plant in 1989, the  
6 identification number was transferred to the Lafarge Corporation, the new owner of the  
7 Meteline Falls cement plant. On August 17, 1995, Lehigh submitted a new "Notification of  
8 Dangerous Waste Activities" for the 13-acre tract on which Lehigh's CKD landfill is located.  
9 EPA/State identification number WAR 000004598 was assigned to the landfill. The new  
10 number was issued with a retroactive start date of May 31, 1989, the date of sale of the cement  
11 plant.

12          6.       On November 5, 1984, Lehigh submitted Part A of the Dangerous Waste Permit  
13 Application to Ecology. Upon submittal of the Part A application, the Lehigh CKD landfill  
14 became an *interim status* dangerous waste treatment, storage, and disposal (TSD) facility.

15          7.       Lehigh did not submit Part B of the Dangerous Waste Permit Application,  
16 which is required to obtain a *final facility* TSD permit. Instead, Lehigh closed the CKD  
17 landfill in accordance with all closure performance standards for *interim status* TSD facilities,  
18 which are given in the Washington Dangerous Waste Regulations (WAC 173-303-400), and by  
19 reference in the federal hazardous waste regulations (40 CFR Part 265, Subparts F through R).

20          8.       Ecology has determined the Lehigh CKD landfill is a dangerous waste facility  
21 as defined in WAC 173-303-040. The dangerous waste facility includes the landfill and  
22 properties adjacent to the landfill, regardless of control, which are affected by releases of  
23 dangerous constituents from the landfill.

24          9.       In 1992 and 1993, Lehigh conducted an investigation to characterize the  
25 CKD landfill and to evaluate the quality of groundwater beneath and adjacent to it. Releases  
26

1 and/or potential releases of dangerous constituents from the CKD landfill were documented in  
2 the following reports:

- 3 • *Preliminary Site Characterization Report*, dated December 17, 1991, prepared by  
4 Dames & Moore Consultants; and
- 5 • *Addendum Preliminary Site Characterization Report, Metaline Falls, Washington*,  
6 dated October 5, 1993, prepared by Dames & Moore Consultants.

7 These reports document that surface and subsurface samples of CKD were collected and  
8 analyzed, and groundwater monitoring wells were installed through and adjacent to the  
9 CKD landfill. Several of the CKD samples analyzed failed the acute static fish toxicity test  
10 [WAC 173-303-110(3)(b)], demonstrating the CKD designated as a Washington state-only  
11 dangerous waste based on the *toxicity criteria* [WAC 173-303-100(5)] at the time of testing.  
12 Geochemical analyses of the CKD samples also demonstrated some of the CKD samples were  
13 strongly alkaline (pH>12.5 standard units), indicating at least part of the CKD pile also  
14 designated as a dangerous waste based on the *characteristic of corrosivity* [WAC  
15 173-303-090(6)]. Geochemical analyses of groundwater samples collected from monitoring  
16 wells demonstrated that groundwater in some areas beneath and adjacent to the CKD landfill  
17 were strongly alkaline (pH up to 13.9 standard units) and contained concentrations of arsenic  
18 and lead, which exceeded Method A groundwater cleanup levels established under MTCA  
(Chapter 70.105D RCW and Chapter 173-340 WAC).

19 10. On April 11, 1996, Lehigh submitted to Ecology the “*Final Closure Plan,*  
20 *Cement Kiln Dust Pile, Metaline Falls, Washington*” for closure of the CKD landfill. Ecology  
21 reviewed the plan, and on May 31, 1996 issued a letter to Lehigh outlining deficiencies in the  
22 plan. On June 7, 1996, Lehigh submitted a revised “*Final Closure Plan.*” Ecology reviewed  
23 and approved the revised plan in a letter to Lehigh dated June 13, 1996.

24 11. Lehigh implemented the approved closure plan during 1996. The CKD landfill  
25 was “closed” by constructing an “impermeable” cover on the surface of the CKD to minimize  
26

1 surface water infiltration and by constructing a stormwater management system to convey  
2 surface water run-on and run-off to and from the landfill. Components of the cover include a  
3 geosynthetic clay liner, a drainage geocomposite (geonet), reinforcement geotextile, and cover  
4 soils. The stormwater management system consists of catch basins, internal and external  
5 drainpipes, and a sediment basin. Closure certification, including documentation of the  
6 construction of the cover and stormwater management system, is given in the "*Closure Report*  
7 *for Cement Kiln Dust (CKD) Pile, Metaline Falls, Washington*", dated June 17, 1997.

8 12. Because a dangerous waste (CKD) remains in the landfill after closure, all  
9 "clean closure" requirements in the Dangerous Waste Regulations have not been satisfied. As  
10 a result, post-closure care of the Closed CKD Pile is required. On July 20, 1995 Lehigh  
11 submitted to Ecology its "*Post-Closure Care and Maintenance Plan*," which describes  
12 maintenance and monitoring requirements for the Closed CKD landfill. The Post-Closure Care  
13 and Maintenance Plan is Exhibit G to this Decree. (The monitoring requirements in Section 5  
14 of Exhibit G are superseded by the requirements of the Compliance Monitoring Plan developed  
15 pursuant to Exhibit C, Scope of Work and Schedule.)

16 13. On December 3, 1996, Ecology issued Administrative Order No.  
17 DE96HS-E934, which required Lehigh to submit and implement another plan for short-term  
18 post-closure care of the Closed CKD Pile. The Order remained in effect until two years of  
19 post-closure groundwater monitoring data were collected.

20 14. On July 8, 1997, Lehigh submitted to Ecology the "*Short-Term Post-Closure*  
21 *Care Plan, Cement Kiln Dust (CKD) Pile, Metaline Falls, Washington*," which documented  
22 Lehigh's plans for groundwater monitoring and for maintenance of the cover and stormwater  
23 management system during the "short-term" post-closure period.

24 15. Between December 1996 and December 1998, Lehigh collected groundwater  
25 monitoring data on a monthly basis. Lehigh also maintained and repaired the cover and  
26 stormwater management system during that time period.



1           16. In April 1999, Lehigh submitted to Ecology the "*Post-Closure Care*  
2 *Groundwater Monitoring Data Review, Closed Cement Kiln Dust Pile, Metaline Falls,*  
3 *Washington,*" a report summarizing post-closure groundwater monitoring data collected  
4 between December 1996 and December 1998. These data indicated that leachate continued to  
5 emanate from the Closed CKD Pile during the short-term post-closure monitoring period,  
6 contaminating groundwater beneath and downgradient of the Closed CKD Pile. The  
7 contaminated groundwater was strongly alkaline and contained elevated concentrations of  
8 arsenic. Elevated concentrations of lead and total chromium also were detected sporadically.  
9 As a result, corrective action was required pursuant to WAC 173-303-64620.

10           17. Corrective action responsibilities may be fulfilled under an enforceable action  
11 issued pursuant to MTCA. In 1999, Ecology and Lehigh executed Agreed Order No.  
12 DE99HS-E941, which required Lehigh to conduct a remedial investigation and feasibility  
13 study under MTCA to address groundwater impacts from the Closed CKD Pile. In 2001,  
14 Ecology and Lehigh executed the First Amended Agreed Order No. DE99HS-E941.

15           18. Lehigh performed the remedial investigation, submitting a Draft Remedial  
16 Investigation Report to Ecology in February 2000 and a Final Remedial Investigation Report  
17 (RI Report) to Ecology in 2001. The RI Report stated that contaminated groundwater flowed  
18 northeast from the Closed CKD Pile, beneath State Route 31 and onto three parcels of property  
19 located in the southeast quarter of Section 21 and the southwest quarter of Section 22, T. 39 N.,  
20 R. 43 E. (WM). These properties are currently owned by Lehigh.

21           19. Some of the most highly contaminated groundwater apparently flows beneath  
22 and parallel to the former course of "North Creek" (now backfilled), a ditch that formerly  
23 transmitted water from the North Culvert beneath State Route 31 to Sullivan Creek. Until late  
24 1998, the contaminated groundwater emerged to the surface at several locations on the  
25 northeast side of the highway, but in November 1998 Lehigh backfilled with sediments a  
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1 low-lying area on properties then owned by the Washington Department of Transportation  
2 (WDOT) and Cameron Grant, thereby preventing the contaminated groundwater from reaching  
3 the surface near State Route 31. This action also reduced the potential for direct contact with  
4 high pH groundwater surfacing in the area. However, contaminated groundwater still emerges  
5 to the surface along the west bank of Sullivan Creek near the mouth of "North Creek."

6 20. Data presented in the RI Report indicated that groundwater beneath and  
7 downgradient of the CKD landfill was strongly alkaline and contained elevated concentrations  
8 of arsenic and lead. The contaminated groundwater discharges into Sullivan Creek.

9 21. Following completion of the remedial investigation, Lehigh installed a pilot In  
10 Situ Groundwater Treatment Wall in order to assess the delivery and treatment capability of  
11 in-situ carbon dioxide diffusion. The subsurface pilot permeable treatment wall demonstrated  
12 the ability to lower groundwater pH to within the range of 6.5 to 8.5, which leads to lower  
13 concentrations of arsenic in groundwater.

14 22. In 2003, Lehigh submitted to Ecology a "*Feasibility Study Technical*  
15 *Memorandum*" containing a preliminary screening of remedial alternatives for the Site. Also  
16 in 2003, Lehigh submitted to Ecology a draft "*Feasibility Study Technical Report*" (dFSTR)  
17 that evaluated a narrower list of potential remedial alternatives. Lehigh revised the dFSTR and  
18 submitted the new version to Ecology on March 3, 2005. Ecology approved the revised  
19 dFSTR by letter dated April 27, 2005, subject to Lehigh submitting some replacement pages.  
20 Lehigh submitted the replacement pages in May 2005. The public comment period for the  
21 final Revised dFSTR followed. Ecology addressed the public comments and then approved the  
22 final Revised dFSTR.

23 23. Based on the RI and final Revised dFSTR, Ecology prepared a draft Cleanup  
24 Action Plan for the Site.  
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1. Lehigh shall implement the Cleanup Action Plan (CAP), Exhibit B, and all attachments developed for the CAP pursuant to its terms. The CAP provides for the following actions:

(b) In accordance with the Scope of Work and Schedule, Exhibit C, installing, operating, and maintaining a gravity drain along the southern edge of the Closed CKD Pile to direct uncontaminated groundwater away from the Closed CKD Pile.

(d) In accordance with the Scope of Work and Schedule, Exhibit C, providing for and maintaining institutional controls in the form of: (1) fences; (2) signs; and (3) recording a restrictive covenant, Exhibit F (Declaration of Covenant), as provided in Section XX of this Decree.

## CONSENT DECREE

2. Lehigh agrees not to perform any remedial actions outside the scope of this Decree unless the Parties agree to modify the Scope of Work to cover these actions. All work conducted by Lehigh under this Decree shall be done in accordance with Chapter 173-340 WAC unless otherwise provided herein.

3. All Exhibits to this Decree are incorporated by reference as integral and enforceable parts of the Decree.

## **VII. DESIGNATED PROJECT COORDINATORS**

The project coordinator for Ecology is:

Name: Mr. William Fees  
Address: Department of Ecology  
4601 North Monroe  
Spokane, WA 99205-1296  
Telephone: (509) 329-3589  
FAX: (509) 329-3572

The project coordinator for Lehigh is:

Name: Ms. Elizabeth Mikols  
Address: Lehigh Cement Company  
7660 Imperial Way  
Allentown, PA 18195  
Telephone: (610) 366-4753  
FAX: (610) 366-4684

Each project coordinator shall be responsible for overseeing the implementation of this Decree. The Ecology project coordinator will be Ecology's designated representative for the Site. To the maximum extent possible, communications between Ecology and Lehigh and all documents, including reports, approvals, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Decree shall be directed through the project coordinators. The project coordinators may designate, in writing, working level staff contacts for all or portions of the implementation of the remedial work required by this Decree. The project coordinators may agree to minor changes to the work to be performed without formal amendments to this Decree. Minor changes will be documented in writing by Ecology. Substantial changes shall require amendment of this Consent Decree.

1 Any Party may change its respective project coordinator. Written notification shall be  
2 given to the other Party at least ten (10) calendar days prior to the change.

### 3 **VIII. PERFORMANCE**

4 All work performed pursuant to this Decree shall be under the direction and  
5 supervision, as necessary, of a licensed professional engineer or licensed hydrogeologist, or  
6 equivalent, with experience and expertise in hazardous waste site investigation and cleanup.  
7 Ecology acknowledges that Lehigh's current consultant, GeoSyntec Consultants, meets the  
8 requirements of this Section VIII. If Lehigh subsequently retains a different consultant, Lehigh  
9 shall notify Ecology in writing of the identity of such engineer(s) or hydrogeologist(s), or  
10 others, and of any contractors and subcontractors to be used in carrying out the terms of this  
11 Decree, in advance of their involvement at the Site.

12 Any construction work performed pursuant to this Decree shall be under the  
13 supervision of a professional engineer or a qualified technician under the direct supervision of  
14 a professional engineer. The professional engineer must be registered in the State of  
15 Washington, except as provided in RCW 18.43.130.

### 16 **IX. ACCESS**

17 Ecology or any Ecology authorized representative shall have full authority to enter and  
18 freely move about all property at the Site that Lehigh either owns, controls, or has access rights  
19 to at all reasonable times for the purposes of, *inter alia*: inspecting records, operation logs, and  
20 contracts related to the work being performed pursuant to this Decree; reviewing Lehigh's  
21 progress in carrying out the terms of this Decree; conducting such tests or collecting such  
22 samples as Ecology may deem necessary; using a camera, sound recording, or other  
23 documentary type equipment to record work done pursuant to this Decree; and verifying the  
24 data submitted to Ecology by Lehigh. Lehigh shall make all reasonable efforts to secure access  
25 rights for those properties within the Site not owned or controlled by Lehigh where remedial  
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1 actions will be performed pursuant to this Decree. Due to the remote location of the Site,  
2 Ecology or any Ecology authorized representative shall give Lehigh notice 48 hours before  
3 entering any portion of the Site owned or controlled by Lehigh unless an emergency prevents  
4 such notice. All Parties who access the Site pursuant to this paragraph shall comply with the  
5 approved Health and Safety Plans. Ecology employees and their representatives shall not be  
6 required to sign any liability release or waiver as a condition of access.

7 **X. SAMPLING, DATA REPORTING, AND AVAILABILITY**

8 With respect to the implementation of this Decree, Lehigh shall make the results of all  
9 sampling, laboratory reports, and test results generated by it or on its behalf available to  
10 Ecology and shall submit these results in accordance with Section XI of this Decree.

11 All sampling data shall be submitted to Ecology according to the requirements of WAC  
12 173-340-840(5) and the Ground Water Sampling Data Submittal Requirements, Exhibit E.  
13 Groundwater sampling data shall also be submitted in an electronic format agreed to by  
14 Ecology's project coordinator. These submittals shall be provided to Ecology in accordance  
15 with Section XI of this Decree.

16 If requested by Ecology, Lehigh shall allow split or duplicate samples to be taken by  
17 Ecology or its authorized representative of any samples collected by Lehigh pursuant to the  
18 implementation of this Decree. Lehigh shall notify Ecology seven (7) days in advance of any  
19 sample collection or non-routine work activity at the Site, unless an emergency prevents such  
20 notice. Ecology shall, upon request, allow split or duplicate samples to be taken by Lehigh or  
21 its authorized representative of any samples collected by Ecology pursuant to the  
22 implementation of this Decree provided it does not interfere with Ecology's sampling.  
23 Without limitation on Ecology's rights under Section IX, Ecology shall provide Lehigh the  
24 same seven (7) day notice prior to any sample collection activity unless an emergency prevents  
25 such notice.  
26

1 In accordance with WAC 173-340-830(2)(a), all hazardous substance analyses shall be  
2 conducted by a laboratory accredited under Chapter 173-50 WAC for the specific analyses to  
3 be conducted, unless otherwise approved by Ecology.

#### 4 **XI. PROGRESS REPORTS**

5 1. Lehigh shall submit to Ecology written progress reports that describe the actions  
6 taken during the previous reporting period to implement the requirements of this Decree. The  
7 progress reports shall include the following:

8 A. A list of on-site activities that have taken place during the reporting period;

9 B. Detailed description of any deviations from required tasks not otherwise  
10 documented in writing and provided to Ecology;

11 C. Description of all deviations from the Scope of Work and Schedule (Exhibit C)  
12 during the current reporting period and any planned deviations in the upcoming reporting  
13 period;

14 D. For any deviations in schedule, a plan for recovering lost time and maintaining  
15 compliance with the schedule;

16 E. All raw data (including laboratory analyses) received by Lehigh during the past  
17 reporting period and an identification of the source of the sample; and

18 F. A list of deliverables for the upcoming reporting period if different from the  
19 Scope of Work and Schedule (Exhibit C).

20 2. Progress reports shall be submitted to Ecology in accordance with the following  
21 schedule:

22 A. Monthly, during construction of the cleanup action;

23 B. Quarterly, beginning with initial start-up of the groundwater treatment system  
24 (start of the Optimization Phase); and

25 C. Annually, beginning July 10 of the fifth year after initial start-up of the  
26 groundwater treatment system (three years after completing the Optimization Phase).

1           3.       All progress reports shall be submitted by the tenth (10th) day of the reporting  
2 period in which they are due after the effective date of this Decree. Unless otherwise specified,  
3 progress reports and any other documents submitted pursuant to this Decree shall be sent either  
4 by certified mail, return receipt requested, or by commercial delivery service, signature  
5 required upon receipt, to Ecology's project coordinator.

## 6                                   **XII.   RETENTION OF RECORDS**

7           During the pendency of this Decree and for ten (10) years from the date this Decree is  
8 no longer in effect as provided in Section XXVIII, Lehigh shall preserve all records, reports,  
9 documents, and underlying data in its possession that are relevant and material to the  
10 implementation of this Decree. Lehigh shall insert a similar record retention requirement into  
11 all contracts with project contractors and subcontractors. Upon request of Ecology, Lehigh  
12 shall make all non-privileged records available to Ecology and allow access for review within a  
13 reasonable time.

## 14                               **XIII.   TRANSFER OF INTEREST IN PROPERTY**

15           No voluntary conveyance or relinquishment of title, easement, leasehold, or other  
16 interest in any portion of the Site shall be consummated by Lehigh without provision for  
17 continued operation and maintenance of any containment system, treatment system, and  
18 monitoring system installed or implemented pursuant to this Decree.

19           Prior to Lehigh's transfer of any interest in all or any portion of the Site, during the  
20 effective period of this Decree, Lehigh shall serve a copy of this Decree upon the prospective  
21 purchaser, lessee, transferee, assignee, or other successor in said interest; and, at least  
22 thirty (30) days prior to any transfer, Lehigh shall notify Ecology of said transfer. In any  
23 instrument that transfers any interest in the Site, Lehigh shall include a provision stating that  
24 the property is subject to the restrictions on the use of the property contained in this Decree,  
25 including all attachments thereto.



#### **XIV. RESOLUTION OF DISPUTES**

A. In the event a dispute arises as to an approval, disapproval, proposed change, or other decision or action by Ecology's project coordinator, the Parties shall utilize the dispute resolution procedure set forth below.

(1) Upon receipt of the Ecology project coordinator's written decision, Lehigh has fourteen (14) days within which to notify Ecology's project coordinator in writing of its objection to the decision.

(2) The Parties' project coordinators shall then confer in an effort to resolve the dispute. If the project coordinators cannot resolve the dispute within fourteen (14) days, Ecology's project coordinator shall issue a written decision.

(3) Lehigh may then request regional management review of the decision. This request shall be submitted in writing to the Eastern Regional Toxics Cleanup Program Section Manager within fourteen (14) days of receipt of Ecology's project coordinator's decision.

(4) Ecology's Eastern Regional Toxics Cleanup Program Section Manager shall conduct a review of the dispute, and shall, if requested, speak with Lehigh (telephonically, at a minimum) in an effort to resolve the dispute. Ecology's Eastern Regional Toxics Cleanup Program Section Manager shall issue a written decision regarding the dispute within thirty (30) days of Lehigh's request for review.

(5) If Lehigh finds Ecology's Eastern Regional Toxics Cleanup Program Section Manager's decision unacceptable, Lehigh may then request final management review of the decision. This request shall be submitted in writing to the Toxics Cleanup Program Manager within fourteen (14) days of receipt of the Regional Section Manager's decision.

(6) Ecology's Toxics Cleanup Program Manager shall conduct a review of the dispute, and shall, if requested, speak with Lehigh (telephonically, at a minimum) in an effort to resolve the dispute. Ecology's Toxics Cleanup Program Manager shall issue a written

1 decision regarding the dispute within thirty (30) days of Lehigh's request for review. The  
2 Program Manager's decision shall be Ecology's final decision on the disputed matter.

3 B. If Ecology's final written decision is unacceptable to Lehigh, Lehigh has the  
4 right to submit the dispute to the Court for resolution. The Parties agree that one judge should  
5 retain jurisdiction over this case and shall, as necessary, resolve any dispute arising under this  
6 Decree. In the event Lehigh presents an issue to the Court for review, the Court shall review  
7 any remedial or investigative action or decision of Ecology on the basis of whether such action  
8 or decision was arbitrary and capricious, or, if the Court determines that that another standard  
9 of review is appropriate, that Ecology's action or decision was not in accord with such  
10 standard.

11 C. The Parties agree to only utilize the dispute resolution process in good faith and  
12 agree to expedite, to the extent possible, the dispute resolution process whenever it is used.  
13 Where either Party utilizes the dispute resolution process in bad faith or for purposes of delay,  
14 the other Party may seek sanctions.

15 D. Implementation of these dispute resolution procedures shall not provide a basis  
16 for delay of any activities required in this Decree, unless Ecology agrees in writing to a  
17 schedule extension or the Court so orders.

18 E. During the dispute resolution process, Lehigh may submit for Ecology's  
19 consideration any data, reports, or other documents it considers relevant to the dispute.

#### 20 **XV. AMENDMENT OF CONSENT DECREE**

21 Except as provided otherwise in Section VII with respect to minor changes in the work to be  
22 performed and Section XVI with respect to extensions of schedule that do not constitute a  
23 substantial change to this Decree, this Decree may only be amended by a written stipulation  
24 among the Parties that is entered by the Court, or by order of the Court. Such amendment shall  
25 become effective upon entry by the Court. Agreement to amend the Decree shall not be  
26 unreasonably withheld by any Party.

1 Lehigh shall submit in writing any request for an amendment to Ecology for approval.  
2 Ecology shall indicate its approval or disapproval in writing in a timely manner after the  
3 request for amendment is received. If the amendment to the Decree represents a substantial  
4 change, Ecology will provide public notice and opportunity for comment. Reasons for the  
5 disapproval of a proposed amendment to the Decree shall be stated in writing. If Ecology does  
6 not agree to any proposed amendment, the disagreement may be addressed through the dispute  
7 resolution procedures described in Section XIV of this Decree.

## 8 **XVI. EXTENSION OF SCHEDULE**

9 A. An extension of schedule shall be granted only when a request for an extension  
10 is submitted in a timely fashion, generally at least thirty (30) days prior to expiration of the  
11 deadline for which the extension is requested, and good cause exists for granting the extension.  
12 All extensions shall be requested in writing. The request shall specify:

- 13 (1) The deadline that is sought to be extended;
- 14 (2) The length of the extension sought;
- 15 (3) The reason(s) for the extension; and
- 16 (4) Any related deadline or schedule that would be affected if the extension were  
17 granted.

18 B. The burden shall be on Lehigh to demonstrate that the request for such  
19 extension has been submitted in a timely fashion and that good cause exists for granting the  
20 extension. Good cause includes, but is not limited to:

- 21 (1) Circumstances beyond the reasonable control and despite the due diligence of  
22 Lehigh including delays caused by unrelated third parties or Ecology, such as (but not limited  
23 to) delays by Ecology in reviewing, approving, or modifying documents submitted by Lehigh;  
24 or
- 25 (2) Acts of God, including fire, flood, blizzard, extreme temperatures, storm, or  
26 other unavoidable casualty such as war or act of terrorism; or

1 (3) Endangerment as described in Section XVII.

2 However, neither increased costs of performance of the terms of the Decree nor  
3 changed economic circumstances shall be considered circumstances beyond the reasonable  
4 control of Lehigh.

5 C. Ecology shall act upon any written request for extension in a timely fashion.  
6 Ecology shall give Lehigh written notification in a timely fashion of any extensions granted  
7 pursuant to this Decree. A requested extension shall not be effective until approved by  
8 Ecology or, if required, by the Court. Unless the extension is a substantial change, it shall not  
9 be necessary to amend this Decree pursuant to Section XV when a schedule extension is  
10 granted.

11 D. An extension shall only be granted for such period as Ecology determines is  
12 reasonable under the circumstances. Ecology may grant schedule extensions exceeding ninety  
13 (90) days only as a result of:

14 (1) Delays in the issuance of a necessary permit which was applied for in a timely  
15 manner; or

16 (2) Other circumstances deemed exceptional or extraordinary by Ecology; or

17 (3) Endangerment as described in Section XVII.

## 18 **XVII. ENDANGERMENT**

19 If, for any reason, Ecology determines that any activity being performed at the Site is  
20 creating or has the potential to create a danger to human health or the environment, Ecology  
21 may direct Lehigh to cease such activities for such period of time as it deems necessary to  
22 abate the danger. Lehigh shall immediately comply with such direction.

23 If, for any reason, Lehigh determines that any activity being performed at the Site is  
24 creating or has the potential to create a danger to human health or the environment, Lehigh  
25 may cease such activities. Lehigh shall notify Ecology's project coordinator as soon as  
26

possible, but no later than twenty-four (24) hours after making such determination or ceasing such activities. Upon Ecology's direction, Lehigh shall provide Ecology with documentation of the basis for the determination or cessation of such activities. If Ecology disagrees with Lehigh's cessation of activities, it may direct Lehigh to resume such activities.

If Ecology concurs with or orders a work stoppage pursuant to this section, Lehigh's obligations with respect to the ceased activities shall be suspended until Ecology determines the danger is abated, and the time for performance of such activities, as well as the time for any other work dependent upon such activities, shall be extended, in accordance with Section XVI, for such period of time as Ecology determines is reasonable under the circumstances.

Nothing in this Decree shall limit the authority of Ecology, its employees, agents, or contractors to take or require appropriate action in the event of an emergency.

#### **XVIII. COVENANT NOT TO SUE**

A. Covenant Not to Sue: In consideration of Lehigh's compliance with the terms and conditions of this Decree, Ecology covenants not to institute legal or administrative actions against Lehigh regarding the release or threatened release of hazardous substances covered by this Decree.

This Decree covers only the Site specifically identified in Exhibit A and those hazardous substances that Ecology knows are located at the Site as of the date of entry of this Decree. This Decree does not cover any other hazardous substance or area. Ecology retains all of its authority relative to any substance or area not covered by this Decree.

This Covenant Not to Sue shall have no applicability whatsoever to:

- (1) Criminal liability;
- (2) Liability for damages to natural resources;
- (3) Any Ecology action, including cost recovery, against potentially liable persons not a party to this Decree.

1 If factors not known to Ecology at the time of entry of the settlement agreement are  
2 discovered and present a previously unknown threat to human health and the environment, the  
3 Court shall amend this covenant not to sue.

4 B. Reopeners: Pursuant to RCW 70.105D.050, Ecology specifically reserves the  
5 right to institute legal or administrative action against Lehigh to require it to perform additional  
6 remedial actions at the Site, and to pursue appropriate cost recovery, under the following  
7 circumstances. Lehigh specifically reserves the right to assert any and all defenses to such  
8 action.

9 (1) Upon Lehigh's failure to meet the requirements of this Decree, including, but  
10 not limited to, failure of the remedial action to meet the cleanup standards identified in the  
11 CAP (Exhibit B);

12 (2) Upon Ecology's determination that remedial action beyond the terms of this  
13 Decree is necessary to abate an imminent and substantial endangerment to human health or the  
14 environment;

15 (3) Upon the availability of new information regarding factors previously unknown  
16 to Ecology, including the nature or quantity of hazardous substances at the Site, that present a  
17 previously unknown threat to human health or the environment, and Ecology's determination,  
18 in light of this information, that further remedial action is necessary at the Site to protect  
19 human health or the environment; or

20 (4) Upon Ecology's determination that additional remedial actions are necessary to  
21 achieve cleanup standards within the reasonable restoration timeframe set forth in the CAP.

22 C. Except in the case of an emergency, prior to instituting legal or administrative  
23 action against Lehigh pursuant to paragraph B. above, Ecology shall provide Lehigh with thirty  
24 (30) days advance notice of such action.

1 **XIX. CONTRIBUTION PROTECTION**

2 With regard to claims for contribution against Lehigh, the Parties agree that Lehigh is  
3 entitled to protection against claims for contribution for matters addressed in this Decree as  
4 provided by RCW 70.105D.040(4)(d). For the purposes of this section only, "matters  
5 addressed" include all remedial actions undertaken at the Site pursuant to this Decree.  
6 "Matters addressed" also include all remedial actions previously undertaken at the Site to  
7 characterize the contamination or to enable the selection of a cleanup action, and all oversight  
8 costs paid to Ecology.

9 **XX. LAND USE RESTRICTIONS**

10 Because institutional controls are required at the Site pursuant to WAC  
11 173-340-440(4), Lehigh agrees that a Restrictive Covenant (Exhibit F, Declaration of  
12 Covenant) shall be recorded with the office of the Pend Oreille County Auditor within sixty  
13 (60) days after Lehigh notifies Ecology that construction of the cleanup action is complete. The  
14 Restrictive Covenant shall restrict future uses of the Site. Lehigh will provide Ecology with a  
15 copy of the recorded Restrictive Covenant within ten (10) days of the recording date.

16 **XXI. FINANCIAL ASSURANCE**

17 A. Pursuant to WAC 173-340-440(11) and consistent with WAC 173-303-64620,  
18 Lehigh shall maintain sufficient and adequate financial assurance mechanisms to cover all  
19 costs associated with the operation and maintenance of the remedial action at the Site as set  
20 forth in the CAP and its attachments, including institutional controls, compliance monitoring,  
21 and corrective measures. In the absence of final regulations governing financial assurance for  
22 corrective action, the Financial Assurance for Corrective Action Proposed Rule, 51 FR 37853  
23 (October 24, 1986), the financial assurance provisions of Corrective Action for Releases from  
24 Solid Waste Management Units Advance Notice of Proposed Rulemaking, 61 FR 19432  
25 (May 1, 1996), the Interim Guidance on Financial Assurance for Facilities Subject to RCRA  
26 Corrective Action (U.S. EPA, September 30, 2003), and the financial assurance provisions of

1 the Corrective Action for Solid Waste Management Units at Hazardous Waste Management  
2 Facilities, 55 FR 30798 (July 27, 1990) may be used as guidance. Acceptable mechanisms  
3 include trust funds, surety bonds guaranteeing performance, letters of credit, insurance, the  
4 financial test, and corporate guarantee or another instrument if Lehigh demonstrates to the  
5 satisfaction of Ecology that another instrument provides an acceptable level of financial  
6 assurance.

7 B. Within sixty (60) days of the effective date of this Decree, Lehigh shall submit  
8 to Ecology for review and approval an estimate of the costs that it will incur in carrying out the  
9 terms of this Decree, including operation, maintenance, and compliance monitoring. Lehigh  
10 also shall include in its submittal an updated estimate of its post-closure care costs, as provided  
11 in WAC 173-303-400(3)(c)(vi) and WAC 173-303-620(5). Within sixty (60) days after  
12 Ecology approves the aforementioned cost estimate, Lehigh shall provide proof of financial  
13 assurance sufficient to cover all such remedial action and post-closure care costs in a form  
14 acceptable to Ecology. The provisions of Section XXI of this Decree shall stand in lieu of any  
15 other requirement for Lehigh to provide proof of financial assurance for post-closure care or to  
16 update the estimated costs of providing post-closure care for the Closed CKD Pile.

17 C. In subsequent years, Lehigh shall adjust the financial assurance coverage  
18 annually in accordance with the schedule set by Ecology, in which regulated entities provide  
19 Financial Assurance by March 31. Lehigh will provide Ecology's project manager with  
20 documentation of the updated financial assurance to reflect:

- 21 (1) Inflation; and  
22 (2) Changes in cost estimates based on the completion of specific remedial actions  
23 or post-closure care tasks.

24 D. In addition, Lehigh shall adjust cost estimates within thirty (30) days of  
25 incorporation into this Decree of any modification or revision to the CAP that result in  
26 significant increases to the cost or expected duration of remedial actions. Any adjustments for



1 inflation since the most recent preceding anniversary date shall be made concurrent with  
2 adjustments for changes in cost estimates.

3 E. Lehigh shall notify Ecology's project coordinator and Ecology's financial  
4 assurance officer by certified mail of the commencement of a voluntary or involuntary  
5 bankruptcy proceeding under Title 11, United States Code, naming Lehigh as debtor, within  
6 ten (10) days after commencement of the proceeding. A guarantor of a corporate guarantee  
7 must make such a notification if he is named as debtor as required under the terms of the  
8 corporate guarantee.

9 F. Once Lehigh has established financial assurance for remedial action and  
10 post-closure care with an acceptable mechanism, mentioned above, Lehigh will be deemed to  
11 be without the required financial assurance:

12 (1) In the event of bankruptcy of the trustee or issuing institution; or

13 (2) The authority of the trustee institution to act as trustee has been suspended or  
14 revoked; or

15 (3) The authority of the institution issuing the surety bond, letter or credit, or  
16 insurance policy has been suspended or revoked.

17 G. In the event of bankruptcy of the trustee or a suspension or revocation of the  
18 authority of the trustee institution to act as a trustee, Lehigh must establish financial assurance  
19 by any means specified in WAC 173-303-620 within sixty (60) days after such an event.

20 H. Ecology's financial assurance officer is:

21 Name: Kimberly Goetz  
22 Address: Department of Ecology  
23 Hazardous Waste and Toxics Reduction Program  
24 P.O. Box 47600  
25 Olympia, Washington 98504-7600  
26 Telephone: (360) 407-6754  
FAX: (360) 407-6715  
E-mail: [kgoe461@ecy.wa.gov](mailto:kgoe461@ecy.wa.gov)

1 **XXII. INDEMNIFICATION**

2 Lehigh agrees to indemnify and save and hold the State of Washington, its employees,  
3 and agents harmless from any and all claims or causes of action for death or injuries to persons  
4 or for loss or damage to property to the extent arising from or on account of acts or omissions  
5 of Lehigh, its employees, or agents in entering into and implementing this Decree. However,  
6 Lehigh shall not indemnify the State of Washington, its employees, or agents, nor save nor  
7 hold any of them harmless, from any claims or causes of action for death or injuries to persons  
8 or for loss or damage to property to the extent arising from or on account of the negligent acts  
9 or omissions of the State of Washington, or the employees or agents of the State, in entering  
10 into or implementing this Decree.

11 **XXIII. COMPLIANCE WITH APPLICABLE LAWS**

12 A. All actions carried out by Lehigh pursuant to this Decree shall be done in  
13 accordance with all applicable federal, state, and local requirements, including requirements to  
14 obtain necessary permits, except as provided in RCW 70.105D.090.

15 B. Pursuant to RCW 70.105D.090(1), the substantive requirements of Chapters  
16 70.94, 70.95, 70.105, 77.55 and 90.58 RCW and of any laws requiring or authorizing local  
17 government permits or approvals for the remedial action under this Decree that are known to  
18 be applicable at the time of entry of the Decree have been included in Exhibit B, the CAP, and  
19 are binding and enforceable requirements of the Decree.

20 Lehigh has a continuing obligation to determine whether additional permits or  
21 approvals addressed in RCW 70.105D.090(1) would otherwise be required for the remedial  
22 action under this Decree. In the event either Lehigh or Ecology determines that additional  
23 permits or approvals addressed in RCW 70.105D.090(1) would otherwise be required for the  
24 remedial action under this Decree, it shall promptly notify the other party of this determination.  
25 Ecology shall determine whether Ecology or Lehigh shall be responsible to contact the  
26 appropriate state and/or local agencies. If Ecology so requires, Lehigh shall promptly consult

1 with the appropriate state and/or local agencies and provide Ecology with written  
2 documentation from those agencies of the substantive requirements those agencies believe are  
3 applicable to the remedial action. Ecology shall make the final determination on the additional  
4 substantive requirements that must be met by Lehigh and on how Lehigh must meet those  
5 requirements. Ecology shall inform Lehigh in writing of these requirements. Once established  
6 by Ecology, the additional requirements shall be enforceable requirements of this Decree.  
7 Lehigh shall not begin or continue the remedial action potentially subject to the additional  
8 requirements until Ecology makes its final determination.

9 Ecology shall ensure that notice and opportunity for comment is provided to the public  
10 and appropriate agencies prior to establishing the substantive requirements under this section.

11 C. Pursuant to RCW 70.105D.090(2), in the event Ecology determines that the  
12 exemption from complying with the procedural requirements of the laws referenced in RCW  
13 70.105D.090(1) would result in the loss of approval from a federal agency which is necessary  
14 for the state to administer any federal law, the exemption shall not apply and Lehigh shall  
15 comply with both the procedural and substantive requirements of the laws referenced in RCW  
16 70.105D.090(1), including any requirements to obtain permits.

#### 17 **XXIV. REMEDIAL AND INVESTIGATIVE COSTS**

18 Lehigh agrees to pay costs incurred by Ecology pursuant to this Decree and consistent  
19 with WAC 173-340-550(2). These costs shall include work performed by Ecology or its  
20 contractors for, or on, the Site under Chapter 70.105D RCW, including remedial actions and  
21 Decree preparation, negotiations, oversight, and administration. These costs shall include  
22 work performed subsequent to the entry of this Decree. In addition, Lehigh shall pay Ecology  
23 \$\_\_\_\_\_ (this amount will be updated before the Decree takes effect), which the Parties agree  
24 represent all costs incurred prior to the entry of this Decree for which Lehigh has not  
25 previously reimbursed Ecology. Ecology costs shall include costs of direct activities and  
26

1 support costs of direct activities as defined in WAC 173-340-550(2). Lehigh agrees to pay the  
2 required amount within ninety (90) days of receiving from Ecology an itemized statement of  
3 costs that includes a summary of costs incurred, an identification of involved staff, and the  
4 amount of time spent by involved staff members on the project. A general statement of work  
5 performed will be provided upon request. Itemized statements shall be prepared quarterly.  
6 Pursuant to WAC 173-340-550(4), failure to pay Ecology's costs within ninety (90) days of  
7 receipt of the itemized statement will result in interest charges at the rate of twelve percent  
8 (12%) per annum, compounded monthly.

#### 9 **XXV. IMPLEMENTATION OF REMEDIAL ACTION**

10 If Ecology determines that Lehigh has failed without good cause to implement the  
11 requirements of this Decree, in whole or in part, Ecology may, after reasonable notice to  
12 Lehigh, perform any or all such requirements of the Decree that remain incomplete. If  
13 Ecology performs all or portions of the Decree because of Lehigh's failure to comply with its  
14 obligations under this Decree, Lehigh shall reimburse Ecology for the costs of doing such work  
15 in accordance with Section XXIV of this Decree, provided that Lehigh is not obligated under  
16 this section to reimburse Ecology for costs incurred for work inconsistent with or beyond the  
17 scope of this Decree.

#### 18 **XXVI. PERIODIC REVIEW**

19 As remedial action, including ground water monitoring, continues at the Site, the  
20 Parties agree to review the progress of remedial action at the Site, and to review the data  
21 accumulated as a result of monitoring the Site as often as is necessary and appropriate under  
22 the circumstances. At least every five years after initiation of cleanup action at the Site (start  
23 of construction), the Parties shall meet to discuss the status of the Site and the need, if any, for  
24 further remedial action at the Site. Ecology reserves the right to require further remedial action  
25 at the Site under the circumstances described in Section XVIII of this Decree. This provision  
26

1 shall remain in effect for the duration of the Decree. A report, which addresses the review  
2 criteria in WAC 173-340-420, shall be submitted by Lehigh to Ecology ninety (90) days before  
3 every 5-year anniversary of the completion of construction.

#### 4 **XXVII. PUBLIC PARTICIPATION**

5 Ecology shall maintain the responsibility for public participation at the Site. However,  
6 Lehigh shall cooperate with Ecology, and shall:

7 A. If agreed to by Ecology, prepare drafts of public notices and fact sheets at  
8 important stages of the remedial action, such as the submission of work plans and engineering  
9 design reports. As appropriate, Ecology will edit, finalize, and distribute such fact sheets and  
10 prepare and distribute public notices of Ecology's presentations and meetings;

11 B. Notify Ecology's project coordinator prior to the preparation of all press  
12 releases and fact sheets, and before major meetings with the interested public and local  
13 governments. Likewise, Ecology shall notify Lehigh prior to the issuance of all press releases  
14 and fact sheets, and before major meetings with the interested public and local governments.  
15 For all press releases, fact sheets, meetings, and other outreach efforts by Lehigh that do not  
16 receive prior Ecology approval, Lehigh shall clearly indicate to its audience that the press  
17 release, fact sheet, meeting, or other outreach effort was not sponsored or endorsed by  
18 Ecology;

19 C. Participate in public presentations on the progress of the remedial action at the  
20 Site. Participation may be through attendance at public meetings or public hearings to assist in  
21 answering questions, or as a presenter;

22 D. In cooperation with Ecology, arrange and/or continue information repositories  
23 at the following locations:

24 (1) Cutter Theater Building at 302 Park Street, Metaline Falls, WA 99153,  
25 (509) 446-3232.  
26

1 (2) Ecology's Eastern Regional Office at 4601 North Monroe, Spokane, WA  
2 99205-1296, (509) 329-3400.

3 At a minimum, copies of all public notices, fact sheets, and press releases; all quality  
4 assured monitoring data; remedial actions plans and reports, supplemental remedial planning  
5 documents, and all other similar documents relating to performance of the remedial action  
6 required by this Decree shall be promptly placed in these repositories.

#### 7 **XXVIII. DURATION OF DECREE**

8 The remedial program required pursuant to the Decree shall be maintained and  
9 continued until Lehigh has received written notification from Ecology that the requirements of  
10 this Decree have been satisfactorily completed or until the Court determines that the  
11 requirements of this Decree have been satisfactorily completed. This Decree shall remain in  
12 effect until dismissed by this Court. When dismissed, Section XVIII, Covenant Not to Sue,  
13 and Section XIX, Contribution Protection, shall survive.

#### 14 **XXIX. CLAIMS AGAINST THE STATE**

15 Lehigh hereby agrees that it will not seek to recover any costs accrued in implementing  
16 the remedial action required by this Decree from Ecology; and further, that Lehigh will make  
17 no claim against the State Toxics Control Account or any Local Toxics Control Account for  
18 any costs incurred in implementing this Decree. Except as provided above, however, Lehigh  
19 expressly reserves its right to seek to recover any costs incurred in implementing this Decree  
20 from any other potentially liable person.

#### 21 **XXX. EFFECTIVE DATE**

22 This Decree is effective upon the date it is entered by the Court.

#### 23 **XXXI. PUBLIC NOTICE AND WITHDRAWAL OF CONSENT**

24 This Decree has been the subject of public notice and comment under RCW  
25 70.105D.040(4)(a). As a result of this process, Ecology has found that this Decree will lead to  
26

1 a more expeditious cleanup of hazardous substances at the Site in compliance with the cleanup  
2 standards established under Chapter 173-340 WAC.

3 If the Court withholds or withdraws its consent to this Decree, it shall be null and void  
4 at the option of any party and the accompanying Complaint shall be dismissed without costs  
5 and without prejudice. In such an event, no party shall be bound by the requirements of this  
6 Decree.

7 STATE OF WASHINGTON  
8 DEPARTMENT OF ECOLOGY

ROB McKENNA  
Attorney General

9 \_\_\_\_\_  
10 JAMES J. PENDOWSKI  
11 Program Manager  
12 Toxics Cleanup Program

\_\_\_\_\_  
ANDREW A. FITZ, WSBA #22169  
Assistant Attorney General

13 Date: \_\_\_\_\_

Date: \_\_\_\_\_

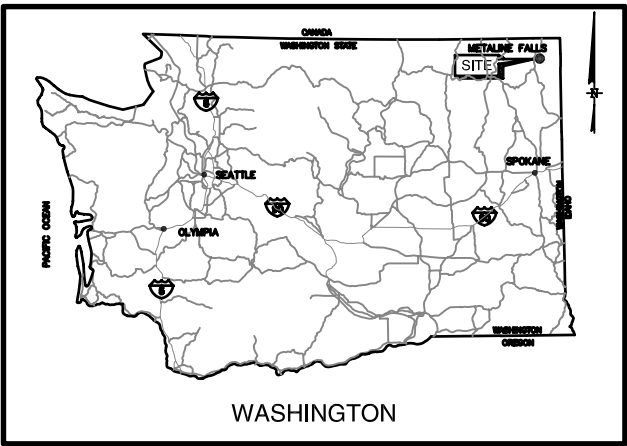
14 LEHIGH  
15 CEMENT COMPANY

16 By: \_\_\_\_\_  
17 Title: \_\_\_\_\_

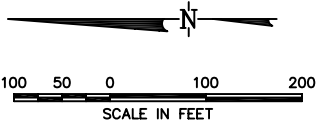
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21 \_\_\_\_\_  
22 JUDGE  
23 Pend Oreille County Superior Court  
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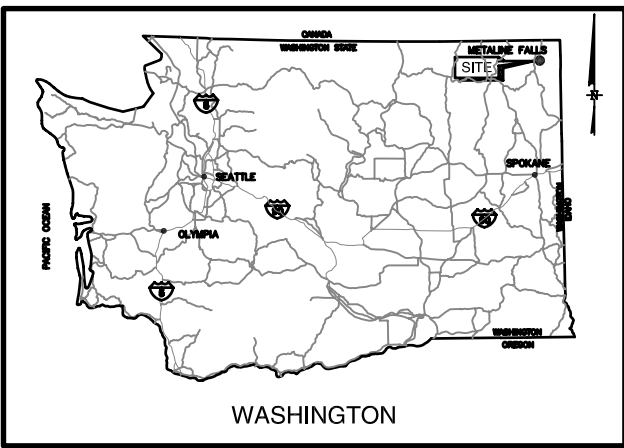
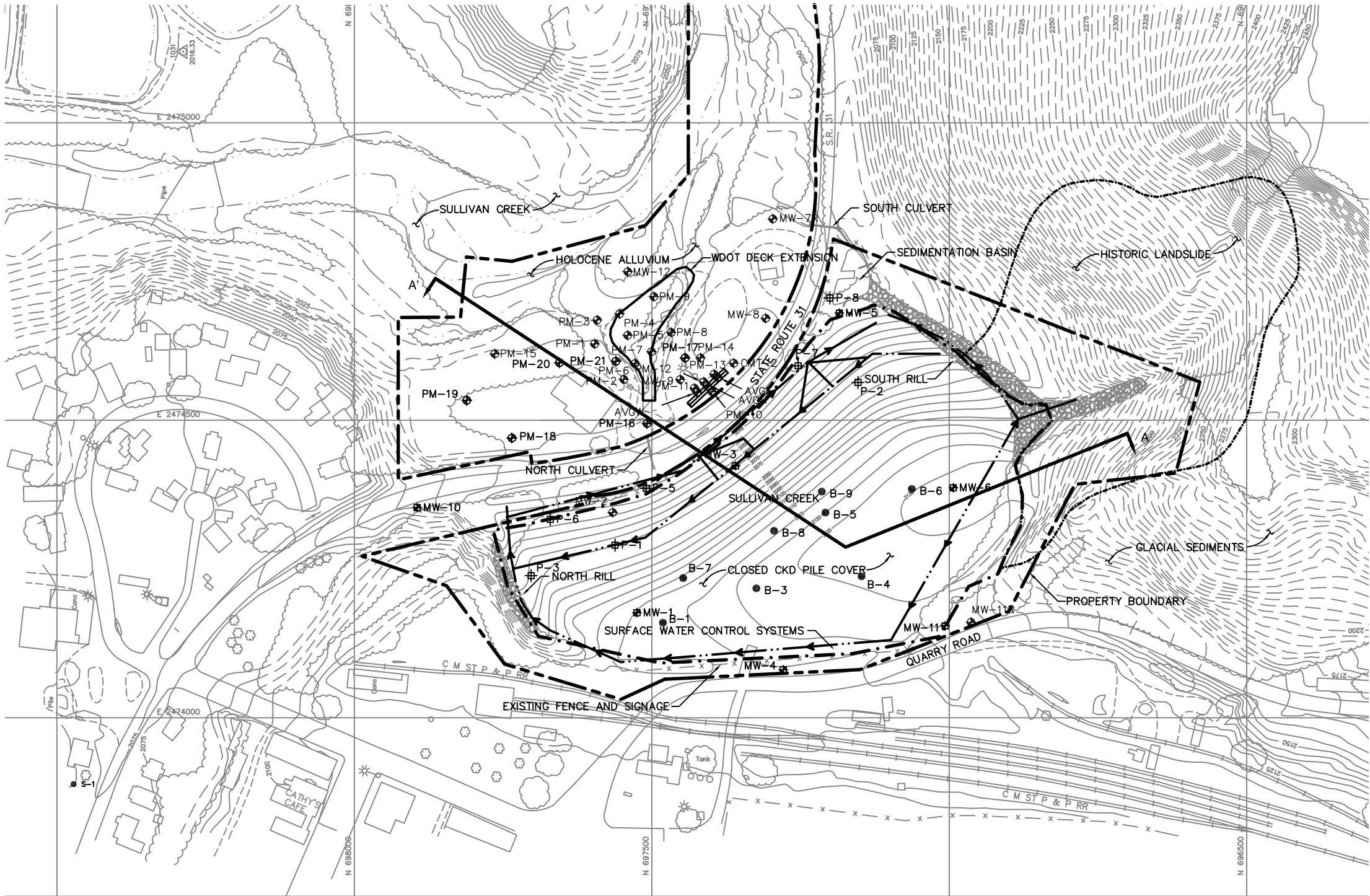
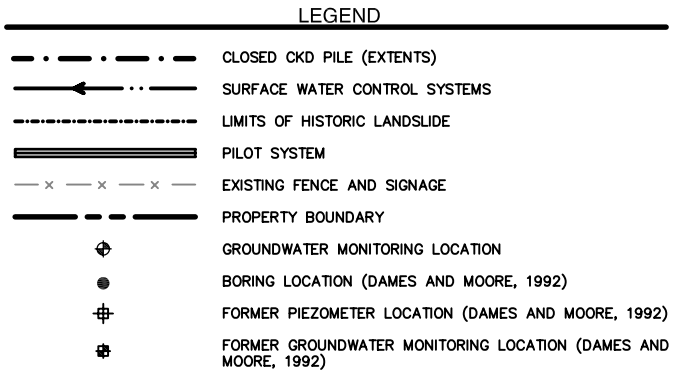
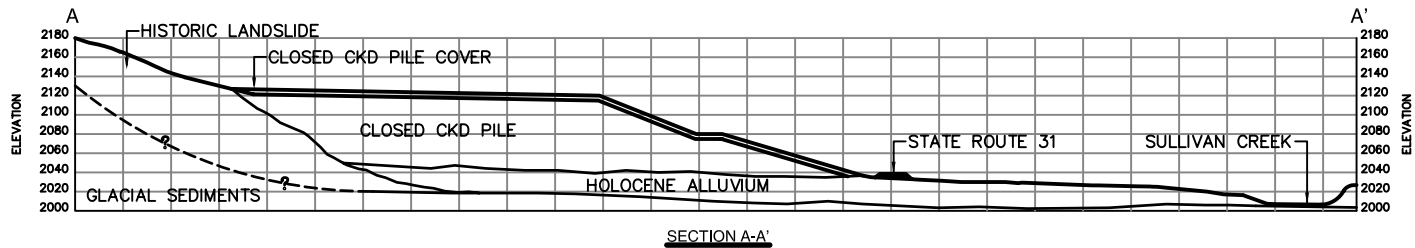
LOCATION MAP



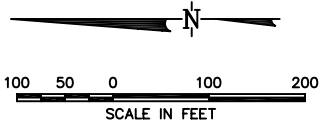
NOTE:  
THIS MAP SHOWS THE APPROXIMATE EXTENTS OF THE LEHIGH CLOSED CKD PILE SITE. THE BOUNDARY SHOWN HERE HAS NOT BEEN SURVEYED. THE EXTENTS SHOWN HERE MAY BE MODIFIED SLIGHTLY DURING DESIGN.


<b>LEHIGH</b> HEIDELBERGCEMENT Group		<b>GEO SYNTEC CONSULTANTS</b> 2100 MAIN STREET, SUITE 150 HUNTINGTON BEACH, CALIFORNIA 92648 TELEPHONE: (714) 969-0800			
PROJECT: LEHIGH CEMENT COMPANY – CLOSED CKD PILE SITE METALINE FALLS, WASHINGTON					
TITLE: SITE DIAGRAM – OVERVIEW					
DATE: DECEMBER 2005	CHECKED BY: EDS	SCALE: AS SHOWN	EXHIBIT		
DESIGN BY: BLP	REVIEWED BY: EDS (PROJ. MGR.)	JOB NO.: HR0196-12	A-1		
DRAWN BY: SLB	DOCUMENT NO: DCAP	FILE NO: 0196F158			





LOCATION MAP



<b>LEHIGH</b> HEIDELBERGCEMENT Group		<b>GEO SYNTec CONSULTANTS</b> 2100 MAIN STREET, SUITE 150 HUNTINGTON BEACH, CALIFORNIA 92648 TELEPHONE: (714) 969-0800			
PROJECT: LEHIGH CEMENT COMPANY – CLOSED CKD PILE SITE METALINE FALLS, WASHINGTON					
TITLE: SITE DIAGRAM – FEATURES					
DATE: DECEMBER 2005	CHECKED BY: EDS	SCALE: AS SHOWN	EXHIBIT		
DESIGN BY: BLP	REVIEWED BY: EDS (PROJ. MGR.)	JOB NO.: HR0196-12	A-2		
DRAWN BY: SLB	DOCUMENT NO: DCAP	FILE NO: 0196F155			

**LEHIGH CEMENT COMPANY  
CLOSED CEMENT KILN DUST PILE SITE  
DRAFT CLEANUP ACTION PLAN**

**JANUARY 2006**

**Prepared by  
WA DEPARTMENT OF ECOLOGY  
TOXICS CLEANUP PROGRAM**

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## **1.0 INTRODUCTION**

This Draft Cleanup Action Plan (DCAP) sets cleanup standards and selects a cleanup action that meets those cleanup standards for the Lehigh Cement Company Closed Cement Kiln Dust (CKD) Pile Site (Site). The Site is located along State Route 31 west of Sullivan Creek in Metaline Falls, Washington. The cleanup action selected for the Site is based upon information contained in the Washington Department of Ecology's (Ecology) files, and information presented in remedial investigations (RIs) and the feasibility study (FS) completed by the Lehigh Cement Company (Lehigh). Lehigh has been named by Ecology as a potentially liable person (PLP) for the Site.

Ecology is responsible for the cleanup action selection and the completion of the DCAP. The selected cleanup action is intended to fulfill the requirements of the Model Toxics Control Act (MTCA) RCW 70.105D. More specifically, the objectives of this document are to satisfy the MTCA requirements set forth in WAC 173-340-380(1) and will include the following:

- A brief Site history description;
- A description of the nature and extent of Site contamination summarized from the remedial investigation (RI);
- Establishment of cleanup standards for each contaminated medium that are protective of human health and the environment;
- Presentation of proposed remedial alternatives summarized from the feasibility study (FS); and
- Ecology's selected cleanup action.

### **1.1 Site Location**

The Site, defined as where hazardous substances have come to be located, includes the Closed CKD Pile and a groundwater contaminant plume. As shown in Figure 1, the Site is located east of Quarry Road and west of Sullivan Creek and is bisected by State Route 31 in Metaline Falls, Washington. The Closed CKD Pile is bounded to the north by a timbered hillside and a small drainageway known as the North Rill and a larger, steeper hill slope to the south and another small drainageway, called the South Rill. The Closed CKD Pile encompasses approximately 7.5 acres and contains about 544,000 tons of CKD. The groundwater plume extends from under the Closed CKD Pile toward Sullivan Creek to the east, and is generally located between Monitoring Well MW-8 to the south and Monitoring Well PM-19 to the north.

Metaline Falls is located in northeast Washington approximately 13 miles south of the Canadian border and 15 miles west of the Idaho border. The Site is located in southeast quarter of Section 21, Township 39 North, Range 43 East, Willamette Meridian (WM) in Pend Oreille County, Washington.

## **1.2 Applicability**

This DCAP is applicable only to the Lehigh Cement Company Closed CKD Pile Site in Metaline Falls, Washington. The remedial actions to be taken at this Site were developed to meet the threshold requirements and other requirements of WAC 173-340-360. Cleanup standards have been developed and cleanup actions selected as an overall remediation process being conducted under Ecology oversight using MTCA authority. Ecology's decisions regarding these matters should not be considered as setting precedent for other sites.

## **1.3 Administrative Documentation**

Documents used to develop this DCAP and the decisions contained herein are contained in Ecology's files. The administrative record for this Site is on file and available for public review by appointment at Ecology's Eastern Regional Office, located at 4601 N. Monroe, Spokane, Washington 99205-1295. Documents that were made available for public comment are also available at the Metaline Falls Public Library (in the Cutter Theater Building). The following documents were used to develop the proposed cleanup action:

- **Cemtech, Inc., 1990. Kiln Dust Management Facility Closure Plan.** August 1990
- **Dames & Moore, 1992. Preliminary Site Characterization Report, Lehigh Portland Cement Company, Metaline Falls, Washington.** December 1992.
- **Dames & Moore, 1993. Addendum Preliminary Site Characterization Report, Lehigh Portland Cement Company, Metaline Falls, Washington.** December 1992.
- **Dames & Moore, 1995. Final Closure Plan for the Closure of the Cement Kiln Dust (CKD) Pile, Lehigh Portland Cement Company, Metaline Falls, Washington.** July 1995.
- **Dames & Moore, 1997. Closure Report for the Cement Kiln Dust (CKD) Pile, Lehigh Portland Cement Company, Metaline Falls, Washington.** June 1997.
- **GeoSyntec Consultants, 1998. Construction Documents for the Washington Department of Transportation Interim Deck Extension, Cement Kiln Dust Pile Closure, Lehigh Portland Cement Company, Metaline Falls, Washington.** October 1998.
- **GeoSyntec Consultants, 2000. Interim Progress Report No. 1, Subsurface Treatability Study, Lehigh Portland Cement Company, Metaline Falls, Washington.** September 2000.
- **GeoSyntec Consultants, 2001. Draft Final Remedial Investigation Report, Lehigh Portland Cement Company, Metaline Falls, Washington.** October 2001.
- **GeoSyntec Consultants, 2002. Design Drawings for the Pilot In-Situ Carbon Dioxide Groundwater Treatment System, Closed Cement Kiln Dust Pile, Lehigh Portland Cement Company, Metaline Falls, Washington.**

- **GeoSyntec Consultants, 2003a. Construction Report, Pilot Groundwater Treatment System, Lehigh Portland Cement Company, Metaline Falls, Washington.** April 2003
- **GeoSyntec Consultants, 2003b. Feasibility Technical Memorandum, Closed Cement Kiln Dust Pile, Lehigh Portland Cement Company, Metaline Falls, Washington.** May 2003.
- **GeoSyntec Consultants, 2004. Supplement to the Draft Feasibility Study Technical Report and Technical Response to the Department of Ecology Request for Further Field Investigation, Closed Cement Kiln Dust Pile, Lehigh Portland Cement Company, Metaline Falls, Washington.** May 2004.
- **GeoSyntec Consultants, 2005. Revised Draft Feasibility Study Technical Report, Closed Cement Kiln Dust Pile, Lehigh Portland Cement Company, Metaline Falls, Washington.** March 2005.
- **Washington Department of Ecology, 2001. Model Toxics Control Act, Chapter 173-340 WAC.** Publication No. 94-06.
- **Washington Department of Ecology, 2001. Cleanup Levels and Risk Calculations under the Model Toxics Control Act, Version 3.1.** Publication No. 94-145.

#### **1.4 Cleanup Process**

Cleanup conducted under the MTCA process requires specific documents to be completed and submitted to Ecology. The DCAP and Public Participation Plan are documents completed by Ecology. These documents are used by Ecology to obtain more detailed information and determine the remedial actions to be conducted and the monitoring requirements prior to and following a cleanup action. These procedural tasks and resulting documents, along with the MTCA section that requires their completion, are listed below with a brief description of each task.

- Remedial Investigation and Feasibility Study - WAC 173-340-350
- Draft Cleanup Action Plan - WAC 173-340-380
- Engineering Design Report - WAC 173-340-400
- Construction Plans and Specifications - WAC 173-340-400
- Operation and Maintenance Plan(s) - WAC 173-340-400
- Cleanup Action Report - WAC 173-340-400
- Compliance Monitoring Plan - WAC 173-340-410
- Public Participation Plan - WAC 173-340-600

The Remedial Investigation and Feasibility Study (RI/FS) process documents the investigations and engineering evaluations conducted at the Site from the discovery phase to the final RI/FS. The investigations are designed to characterize the type and extent of contamination and the associated risks posed by the contamination to human health and the environment. The FS presents and evaluates different Site cleanup alternatives and proposes the preferred cleanup alternative. The Draft Remedial Investigation Report and Revised Draft Feasibility Study Technical Report (DFSTR) were reviewed by Ecology,

made available for public review and comment, and then finalized.

The DCAP sets the cleanup standards for the Site and selects the cleanup actions intended to achieve the cleanup standards. After opportunity for public comment and any revisions made following public comment, the DCAP is finalized with an attached responsiveness summary and becomes the cleanup action plan (CAP).

The Engineering Design Report outlines the engineered system and design components of the CAP. Construction Plans and Specifications provide the technical drawings and specifications for design and implementation of the CAP.

The Operation and Maintenance (O&M) Plan(s) summarizes the requirements for inspection and maintenance as well as the regulatory and technical necessities to assure effective operations. The O&M Plan(s) outline the actions required to operate and maintain any equipment, structures, or other remedial facilities used in the cleanup action.

A Cleanup Action Report will be completed following implementation of the selected cleanup action. The report will detail the activities performed for the Site cleanup action and provide documentation of adherence to or variance from the CAP.

Compliance Monitoring Plans are designed to serve the following three purposes:

- Protection – Confirm that human health and the environment are being protected during construction and O&M tasks for the cleanup action at the Site.
- Performance – Confirm that the cleanup action has attained cleanup standards.
- Confirmation – Confirm the long-term effectiveness of the cleanup action after cleanup standards have been attained.

The Public Participation Plan is the framework to provide the public with information and give it the opportunity for participation in a site. This plan is tailored to meet the public's needs and coordinate its effort in the MTCA process.

## **2.0 SITE HISTORY**

The following paragraphs provide a brief summary of ownership, operational, and regulatory history of the Site. The information provided herein was provided in the Remedial Investigation reports completed by Dames & Moore, Inc., GeoSyntec Consultants, and other reports provided to Ecology.

The information contained herein is not the result of a title search and is based upon information gathered from various sources. From 1914 to 1989, Lehigh operated a cement plant in Metaline Falls, Washington. The plant utilized a dry processing kiln as part of the production process. The resulting kiln gases were routed through the plant's dust collection systems. Cement kiln dust (CKD), a by-product of Portland cement production, was produced and collected from the Lehigh plant. The CKD was



transported from the dust collection systems to a ravine across Quarry Road, east of the plant. Approximately 544,000 tons of CKD were placed in the ravine to form the CKD landfill. Lehigh sold the cement production plant and specific land holdings to Lafarge Corporation in 1989. Lehigh retained ownership of the CKD landfill. Lehigh capped the CKD Pile and installed other closure systems in 1996, in accordance with an Ecology-approved Closure Plan. During closure discussions in 1994, both Ecology and Lehigh began to refer to the CKD landfill as the CKD Pile. In 1996, the closed landfill then became known as the Closed CKD Pile.

Downgradient groundwater impacts persisted following closure of the CKD Pile. Since closure of the CKD Pile, Lehigh has conducted several groundwater investigations, and installed a pilot-scale in situ treatment system. The FSTR, which evaluated a variety of treatment technologies to address the groundwater contamination, recommended a preferred cleanup action for the Site. This DCAP describes the planned implementation of the cleanup action.

## **2.1 Regulatory History**

The following is a brief regulatory history of the Site.

- In 1981, Ecology inspected the CKD landfill and determined that the CKD landfill was subject to the Water Pollution Control Act (RCW 90.48) and the Solid Waste Management Act (RCW 70.95).
- Lehigh submitted Dangerous Waste Permit Forms 1 and 3 and a Part A application to Ecology in 1984 in order to fulfill WAC 173-303 requirements.
- In 1984, Lehigh also submitted a petition to Ecology to exempt the CKD from the Dangerous Waste Regulations.
- Ecology issued a tentative denial of the petition to exempt CKD from the Dangerous Waste Regulations in 1985.
- On February 1, 1990, Ecology sent a letter to Lehigh informing Lehigh that the CKD landfill was out of compliance with Dangerous Waste Regulations for interim status facility standards. At that time, Ecology provided two options for compliance with the regulation.
- In March 1990, Ecology issued a final denial of petition for exemption of the CKD from the Dangerous Waste Regulations.
- Lehigh submitted a closure plan to Ecology in August 1990.
- In 1992, Lehigh received approval for a site characterization work plan. The site characterization was completed from August 1992 to February 1994.
- Ecology requested that Lehigh submit a Draft Closure Plan for the CKD Pile in 1994.
- In 1994, a Draft Closure Plan was submitted to Ecology.
- In 1995, Lehigh submitted a Post-Closure Care and Maintenance Plan to Ecology.
- A final Closure Plan and Design Report were submitted to Ecology in 1996.
- The approved closure plan was implemented in 1996.
- In 1996, Ecology issued Administrative Order No. DE96HS-E934 to Lehigh for

the submittal and implementation of a short-term post-closure care plan that included two years of groundwater monitoring.

- In 1997, Lehigh submitted a “Short-Term Post-Closure Care Plan” and a “Closure Report for the Cement Kiln Dust (CKD) Pile” to Ecology.
- An Emergency Order No. DE98-HS-E938 was issued under MTCA authority to Lehigh in order to complete a Washington Department of Transportation (WSDOT) Deck Extension in 1998. The deck extension reduced the potential for direct contact with high alkaline groundwater that surfaced and ponded on the property.
- In April 1999, Lehigh submitted the “Post-Closure Care Groundwater Data Review” that described the two years of groundwater data that were collected following closure.
- In December 1999, Ecology and Lehigh entered into an Agreed Order No. DE99HS-E941 for the completion of a RI/FS for the contaminated groundwater downgradient of the Closed CKD Pile.
- Amendment to Agreed Order No. DE99HS-E941 to accommodate a pilot test and treatability study was signed in 2001.
- Lehigh submitted a RI report to Ecology in 2001.
- A pilot groundwater treatment system was installed in October and November 2002, and the construction report was submitted in 2003.
- A Feasibility Study Technical Memorandum was submitted in May 2003.
- Additional summer investigation and performance monitoring was completed in the summer of 2003.
- The first draft of a Feasibility Study Technical Report was submitted in November 2003.
- Ecology completed a summer investigation in 2004 to assist in conceptual site model analysis.
- The final draft of the Feasibility Study Technical Report was submitted in March 2005 and was made available for public comment in May 2005 and finalized in June 2005.

### **3.0 PHYSICAL SETTING**

The Site is located immediately southeast of Metaline Falls, Washington in the southeast quarter of Section 21, Township 39 North, Range 43 East, Willamette Meridian (WM). Topographic map coverage of the Site and vicinity is provided by the Metaline Falls Quadrangle, U.S. Geological Survey, 7.5 minute series dated 1967 and photorevised in 1986. The Closed CKD Pile’s elevation along Quarry Road is about 2110 feet above sea level and approximately 2025 feet near State Route 31 using the National Geodetic Vertical Datum (NGVD) of 1929. The elevation of the portion of the Site between State Route 31 and Sullivan Creek is approximately between 2020 and 2025 feet above sea level.

Sullivan Creek is the nearest surface water body and forms the eastern boundary of the Site. Sullivan Creek joins the Pend Oreille River downstream from the Site. The Pend Oreille River is the major surface water course in the area and is located approximately

1,700 feet west of the Site. In the Site vicinity, the Pend Oreille River flows north into Canada.

### **3.1 Regional Geology**

The Site lies within the Metaline Lead-Zinc District, which encompasses about 75 square miles (Dings and Whitebread 1965). The Metaline District is characterized by sediments deposited in a carbonate reef environment. The oldest rocks were deposited during the Cambrian Period. The deposition in the shallow marine environment continued through the Ordovician Period into the Silurian/Devonian Period. This deposition resulted in sequences of limestone, dolomite, and shale. Toward the end of the marine deposition, depositional evidence such as the Ledbetter Slate suggests a transition from a shallow environment to deep marine sedimentation. A large quantity of breccias observed within the carbonate rocks as well as turbidite beds within the Ledbetter Slate suggests a tectonically active basin margin that was rapidly deepening (Morton 1992).

As a result of the major orogenic or mountain building episode during the Cretaceous Period, the Metaline area rocks were folded, faulted, and intruded by igneous dikes, stocks, and sills. During the Tertiary Period, folding and faulting occurred within the Metaline District, which resulted in the formation of the graben that characterizes the Metaline District. Several northeast trending low-angle thrust faults indicate compression of the sedimentary carbonates either prior to or during graben formation.

During the Quaternary Period, continental glacial ice began to shape the landscape. Glaciofluvial and glaciolacustrine sediments covered the Metaline area. Erosion has shaped the current landscape of incised highlands and glacial valleys. Glacial lake bed sediments are the most dominant glacial sediment in the Metaline area and range in thickness from 200 to 500 feet (Dings and Whitebread 1965).

#### **3.1.1 Site Geology/Waste Pile Configuration**

Borings and monitoring wells were installed through the CKD landfill prior to its closure. Based on the borings, CKD thicknesses vary from 72 feet at monitoring well MW-1 at the northern end to 39 feet in monitoring well MW-6 at the southern end (Figure 2). The CKD appears thickest in the area of boring B-3 near the center, where the CKD was 78 feet thick. The thickest sequence of native soil under the CKD landfill, 28 feet, was encountered in the MW-1 boring. The native soil consists of sandy silt to silty sand and sandy gravel. Based on the soil borings, the soil underlying the north and south edges is mostly sandy silt and grades to more granular material such as gravelly sand near the pile center.

The soil underlying the former WSDOT property east of State Route 31 consists of interlayered sandy silt to silty sand with trace or more amounts of clay. The fine-grained soil is underlain by silty to sandy gravel. The gravel varies from five to ten feet in thickness in this area. The saturated gravel overlies a silty clay to clay unit. The clay unit appears to be a low permeability unsaturated unit. Borings or monitoring wells have

not been completed through this clay unit to determine the thickness. In Boring FSB-04 between State Route 31 and Sullivan Creek, 13 feet of the clay unit was encountered prior to abandonment of the boring.

### **3.2 Regional Hydrogeology**

Groundwater occurs in the alluvial and unconsolidated glacial sediments as well as the underlying bedrock. In the Metaline Falls area, the unconfined alluvial aquifer is underlain by the laterally continuous Ledbetter Slate, which separates the alluvial aquifer from the deeper bedrock aquifer located within the Metaline Limestone. The unconsolidated glacial and alluvial deposits provide the majority of the domestic production in the area. The thickness of the glaciofluvial and glaciolacustrine sediments is dependent on the bedrock topography and is generally thickest near major streams and thins away from the valleys. Based on review of well logs on file with Ecology, domestic and commercial wells in the Metaline Falls area that are completed in bedrock have been found to yield between 30 to 250 gallons per minute.

#### **3.2.1 Site Hydrogeology**

The aquifer that flows beneath the Site is an unconfined water bearing zone that occurs within sandy silt to silty sand and sandy gravel. The initial assessment of hydrogeologic conditions consisted of the installation of eight piezometers. Seven of the piezometers were installed through the CKD and one was installed at the southern toe of the landfill. Prior to closure, eleven monitoring wells were installed at the Site to monitor groundwater. Monitoring well MW-11, located southwest of the landfill along Quarry Road, served as the upgradient well, while monitoring well MW-4, located west of the landfill along Quarry Road, was considered cross-gradient. Two monitoring wells, MW-1 and MW-6, were completed through the CKD in order to monitor conditions beneath the landfill. Four monitoring wells were placed between State Route 31 and the CKD landfill and three additional wells were placed east of State Route 31. These seven wells were considered downgradient of the landfill.

Since closure in 1996, a total of twenty-five (25) monitoring wells and sixty-one (61) temporary wells have been completed at the Site. The total of sixty-one (61) temporary wells includes ten temporary wells that Ecology installed during its 2004 summer investigation. With the exception of twenty temporary wells, the permanent and temporary wells were completed east of State Route 31, downgradient of the Closed CKD Pile.

The groundwater flow direction downgradient of the Closed CKD Pile is generally northeast. The flow direction can vary slightly based on seasonal flow characteristics. A horizontal hydraulic gradient of 0.097 feet/foot was estimated underneath the Closed CKD Pile from data collected from monitoring wells MW-6 and MW-3. The gradient flattens as it crosses State Route 31 and encounters the Sullivan Creek flood plain. A horizontal hydraulic gradient of 0.040 feet/foot was estimated east of State Route 31 and is based on data from monitoring wells MW-8 and MW-12.

Groundwater discharges to Sullivan Creek in the Site area. During times of shallow surface water flow, amber colored groundwater seep discharge can be observed along the bank. The groundwater discharge quality will be discussed in Section 4.0.

### **3.3 Surface Water**

Sullivan Creek forms the eastern boundary of the Site. The creek flows west along the site and turns north near the northeast corner of the Site and continues for about 700 feet. Following this northerly run, Sullivan Creek turns and flows west again to its confluence with the Pend Oreille River. At its closest point, the Pend Oreille River is located approximately 1,600 feet northwest of the Site.

The Pend Oreille River, one of the major sub-basins of the Columbia River, drains headwater basins in Montana and Idaho and flows through the northeast corner of Washington. The Pend Oreille River joins the Columbia River in southern British Columbia. The Pend Oreille River watershed is comprised of nineteen sub-basins and drains an area of about 25,200 square miles. The Site is located within the Sullivan sub-basin, the largest sub-basin in the watershed, draining 142 square miles.

The headwaters of Sullivan Creek begin as an outlet for Sullivan Lake and flows are regulated by Sullivan Dam. The Washington Department of Fish and Wildlife has established a minimum flow for Sullivan Creek below Mill Pond Dam. The minimum flows are set for the months of October through March at 75 cubic feet per second (cfs). These minimum flows are critical for fish egg incubation.

## **4.0 REMEDIAL INVESTIGATION**

In 1992, Lehigh began preliminary characterization of the CKD landfill for the purpose of assessing closure options. The characterization included completion of the following:

- Installation of eleven soil borings, six of which were completed as monitoring wells.
- Collection of background soil samples as well as surface CKD samples for chemical analysis.
- Identification of three groundwater seeps and sample collection for chemical analysis.
- Identification of three surface water sampling stations in Sullivan Creek for stream flow and sample collection for chemical analysis.
- Collection of eight sediment samples in seep and surface water locations.

The preliminary characterization indicated that groundwater downgradient of the CKD landfill was affected by high pH and select metals. The chemical characterization of the CKD indicated that a subset of the CKD samples contained elevated concentrations of cadmium, chromium, and lead. Toxicity characteristic leaching procedure (TCLP) analysis indicated that the CKD did not exceed dangerous waste regulations for the elevated metals. However, some of the CKD samples had a pH greater than 12.5

standard units (SU), and therefore, the material qualified as a state-only dangerous waste under WAC 173-303-090(6).

Additional site characterization was performed in 1993 in order to further characterize downgradient groundwater impacts and provide geotechnical information to develop engineering design considerations for the closure plan. The 1993 field program included:

- Installation of three soil borings into the CKD for geotechnical engineering analysis.
- Installation of five additional monitoring wells.
- Collection of groundwater samples from existing wells and the new wells.
- Collection of two groundwater seep samples downgradient of the CKD landfill.

The groundwater information collected from this field program supports conclusions made from the first characterization program. Three of the five new wells installed indicated that CKD had not impacted the wells. The seep sample collected east of State Route 31 contained elevated pH and metals similar to the affected groundwater in monitoring wells.

Following the completion of the second phase of characterization, work began on drafting a closure plan for the CKD landfill. A draft closure plan was submitted to Ecology in 1994. Lehigh submitted a Post-Closure Care and Maintenance Plan to Ecology in 1995. The final closure plan was approved by Ecology in 1996 and was implemented in 1996. The closure plan included placing a cover system on the pile to reduce water infiltration, installing a stormwater management system, and performing post-closure care of the cover and water control systems.

Agreed Order DE96HS-E934 provided for the short-term post-closure care of the Closed CKD Pile and two years of groundwater monitoring. The groundwater monitoring indicated that the contaminated groundwater observed prior to closure continued to be present downgradient of the Closed CKD Pile. In addition to the groundwater monitoring, an emergency action was completed in 1998. The project, known as the Washington Department of Transportation (WSDOT) Deck Extension, entailed filling a topographic low area on WSDOT property east of State Route 31. This low area represented an immediate threat to human health and the environment due to the surfacing and accumulation of highly alkaline groundwater.

An Agreed Order was signed in 1999 for the completion of a focused Remedial Investigation/ Feasibility Study (RI/FS) of groundwater and surface water contamination associated with the Closed CKD Pile. The RI/FS Work Plan was finalized in October 1999. The focused RI program was developed to further characterize and define the groundwater contamination. The focused RI program was conducted by Lehigh's consultant, GeoSyntec, with a final report submitted to Ecology in 2001. The focused RI program included:

- Re-drilling two monitoring wells and installing one new monitoring well.
- Drilling twenty temporary wells east of State Route 31.

- Sampling permanent and temporary wells to monitor groundwater quality.
- Sampling surface water from seeps.
- Sampling soil from downgradient of the Closed CKD Pile.
- Surveying monitoring well elevations.

The RI work is documented in the report titled: Final Report Remedial Investigation Closed Cement Kiln Dust Pile, Metaline Falls, Washington. October 2001. The RI Report presents a summation of previous investigations conducted at the Site and the findings of the focused RI program.

Soil and CKD samples were collected during the earlier characterization phases of the project in 1992 and 1993. Additional soil samples were collected in 1999 during the RI. CKD samples and native soil samples were analyzed for total metals. The results suggested that the CKD and soil metal concentrations were similar. These concentrations were mostly below MTCA Method A cleanup levels.

Sediment samples collected in 1992 from Sullivan Creek indicated that total metal concentrations were below MTCA Method A soil cleanup levels. Sediment samples collected in 1998 from the ponded water area on the WSDOT property that was subsequently covered in the deck extension project also showed that total metal concentrations were below MTCA Method A soil cleanup levels.

Groundwater samples were collected prior to placement of the cover system, with collection continuing after cover placement. Groundwater samples collected during the characterization phase of the project prior to CKD Pile closure were submitted for volatile organic and semi-volatile organic compounds. Sample results were either below detection limits or well below Method B cleanup levels. Method B levels were used for comparative purposes. Samples were also submitted for total metals analysis of aluminum, antimony, arsenic, cadmium, chromium, copper, iron, lead, mercury, nickel, selenium, silver, and zinc; total petroleum hydrocarbon identification; and alkalinity. Some of the samples contained elevated concentrations of arsenic, cadmium, chromium, and/or lead.

Following cover system placement, the groundwater sample parameters focused on pH, metals and analytes specific to geochemical analysis such as major cations and anions. Sample analyses indicated that high pH continued to be present downgradient of the Closed CKD Pile. In addition to the elevated pH, arsenic concentrations were observed to be above Method A cleanup levels in samples from downgradient wells. Lead and chromium concentrations have decreased since the CKD Pile was closed.

Surface water samples were collected from seeps discharging to Sullivan Creek and from locations near the Closed CKD Pile. The samples were submitted for total metals analysis of aluminum, antimony, arsenic, cadmium, chromium, copper, iron, lead, mercury, nickel, selenium, silver, and zinc and alkalinity. Seep water analysis indicated that high pH and elevated arsenic concentrations were present in the seep samples from downgradient of the Closed CKD Pile.

#### **4.1 Groundwater Contamination**

Groundwater beneath and along the margins of the Closed CKD Pile comes in contact with the CKD. This results in highly alkaline water with a pH that has been measured as high as 13.9 standard units (S.U.). The high pH groundwater strips native metals from the surrounding soil and transports the dissolved metals downgradient of the Closed CKD Pile. For the first level of screening, a Method A cleanup level for contaminants was used. Of the elevated metals in groundwater downgradient of the Closed CKD Pile, arsenic is the only metal that continuously exceeds a MTCA cleanup level. Chromium and lead were encountered in the early phases of investigation, and while concentrations are still elevated, levels have decreased. The Method A groundwater cleanup level for arsenic is 5 parts per billion (ppb), which is based on natural background for the state of Washington.

As discussed, groundwater pH measurements at the Site range as high as 13.9 S.U. The high pH groundwater flows from the Closed CKD Pile beneath State Route 31 and encounters the flood plain of Sullivan Creek. The plume moves north to mostly northeast on the east side of the highway.

#### **4.2 Pilot Treatment Wall**

Following completion of the RI, Lehigh proposed to test, at the pilot scale, an innovative technology for contaminated groundwater treatment. The technology involved lowering pH in-situ by diffusing carbon dioxide gas into the groundwater via a subsurface treatment wall. The carbon dioxide reacts with groundwater to form the weak dissociable acid, carbonic acid, and in turn lowers the pH. The pilot treatment wall was installed to assess the delivery and treatment capability of in-situ carbon dioxide diffusion. The wall was operational in November 2002 and has been operated since then. The pilot treatment wall has demonstrated the ability to lower groundwater pH to within the cleanup level range of 6.5 to 8.5.

#### **4.3 Summer Investigation**

In July 2004, Ecology completed a field investigation to assess the presence of seeps in the south rill area and groundwater in the Closed CKD Pile toe area. Seven soil borings were completed at the Closed CKD Pile toe and three soil borings in the south rill area. Temporary well screens were placed in six of the borings in the toe area. The temporary wells were used to measure groundwater elevations and measure the pH at each location.

Three borings completed in the south rill area were used to assess the presence of seeps. Soil samples were retrieved from the borings and submitted to the laboratory for physical testing, which included moisture density and moisture content. Based on the investigation results in the south rill, Ecology does not believe the “seeps” area as described in the Draft Feasibility Study Technical Report is a significant source of groundwater.



## **5.0 CLEANUP STANDARDS**

The cleanup standard development process is used to determine which hazardous substances contribute to an overall threat to human health and the environment at a site. Once these substances are identified, an evaluation is made to determine at what concentration these substances are considered to be protective of human health and the environment. A point of compliance is then established on the Site, which is a point or points where these cleanup levels must be attained (WAC 173-340-200). Cleanup standards include both cleanup levels and points of compliance for those cleanup levels.

MTCA provides three main methods for establishing cleanup levels at a site. These are Method A, B, and C. Method A provides cleanup levels for routine cleanup actions or sites with relatively few hazardous substances. Methods B and C cleanup concentrations are calculated from applicable or relevant and appropriate requirements (ARARs) and from using the formulas provided in WAC 173-340-720 through WAC 173-340-760. Method B is the standard method for establishing cleanup levels and is applicable to all sites. Method C is a conditional method for use at sites subject to specified uses.

Following establishment of cleanup levels, media having concentrations above cleanup levels must be addressed using one or more technologies selected as part of the remedy. Criteria for remedy selection are outlined in WAC 173-340-360.

Groundwater is the contaminated medium at the Site. Arsenic, lead, chromium, manganese, and high pH are the indicator substances (as defined in Section 5.1 below) that have been identified in this medium. The metal contamination is a direct result of the high pH, since the high pH groundwater strips and transports native metals from the surrounding soil.

Two exposure pathways have been considered in establishing cleanup standards for this Site. These pathways are the protection of groundwater and surface water. Even though the Site is located in an area that allows for a mixture of uses, Ecology has determined that the most reasonable exposure scenario is contact via ingestion of contaminated drinking water and dermal contact with groundwater and surface water.

Groundwater cleanup standards are set according to WAC 173-340-720. As stated previously, the highest beneficial use of Site groundwater is as a current and future drinking water source. Ecology has determined that the reasonable maximum exposure expected is through ingestion of drinking water and other domestic uses (WAC 173-340-720 (1) (a)). A Method B cleanup standard will be used for establishing cleanup levels in groundwater at the Site.

### **5.1 Indicator Substances**

Indicator substances as defined by WAC 173-340-200 are a subset of hazardous substances present at a site selected under WAC 173-340-708 for monitoring and analysis

during any phase of remedial action for the purpose of characterizing a site or establishing cleanup requirements for a site.

As discussed above, metals and pH have been identified as chemicals of concern at the Site. Indicator substances are selected from the list of chemicals of concern. The criteria found in WAC 173-340-703 are used to screen the list of chemicals. Following the selection of indicator substances, cleanup levels are developed for the list of substances that are used to calculate the total site risk. Protection of groundwater is considered in conjunction with exposure scenarios. For non-carcinogenic substances, the summation of risk for each toxic endpoint of all media must not exceed a hazard index of one. For establishing cleanup levels of carcinogenic substances, the total cancer risk from all chemicals in the affected media must not be greater than one in one hundred thousand or  $1 \times 10^{-5}$ .

#### 5.1.1 Groundwater Indicator Substances

As discussed previously, the highest beneficial use of Site groundwater is as a current and future drinking water source. Exposure through ingestion and other domestic uses is the main groundwater pathway. Arsenic, chromium, lead, manganese, and pH will be used as indicator substances for groundwater. Groundwater indicator substance screening results are presented as Table 1.

Metals contamination at this Site is associated with elevated pH concentrations. The arsenic concentrations appear to diminish along the plume edges more rapidly than the decreases in groundwater pH. The metals contamination plume lies within the pH plume.

### 5.2 **Cleanup Standard Development**

The indicator substance screening yielded five groundwater contaminants that will be carried forward for cleanup standard development. While soil cleanup levels will not be developed for the Site, soil downgradient of groundwater treatment system may accumulate arsenic, lead, chromium, or manganese. In the event soil within the treatment system corridor requires removal to improve flow and treatment conditions, the soil will be subject to analytical testing in order to determine proper disposal requirements. Groundwater cleanup levels will be set to be protective of human health via ingestion and other domestic uses as well as protection of surface water.

#### 5.2.1 Groundwater Cleanup Levels

Groundwater levels set under Method B for groundwater must be at least as stringent as the criteria in WAC 173-340-720(4)(b), which includes the following:

- i) Concentrations established under applicable state and federal laws, including the requirements in WAC 173-340-720(3)(b)(ii), which includes the following:
- ii) For protection of surface water beneficial uses.

- iii) For hazardous substances for which sufficiently protective, health-based criteria or standards have not been established under applicable state and federal laws, those concentrations which protect human health as determined by the equations presented in WAC 173-340-720 (3)(iii)(A) and (B).

To develop cleanup levels for the Site, Ecology evaluated existing Site groundwater data and compared these data to Method B cleanup levels. Table 2 presents the Method B cleanup levels for indicator substances arsenic, lead, chromium, manganese, and high pH in groundwater. Groundwater at the Site discharges to Sullivan Creek, resulting in groundwater cleanup levels that must be set to be protective of drinking water and surface water.

For arsenic, the most stringent of these concentrations is the National Toxics Rule (NTR) 40 CFR 131 surface water concentration of 0.018 micrograms per liter (ug/L). However, this concentration is less than the natural background concentration of arsenic for the state of Washington. When a cleanup level is less than a natural background level, the cleanup level is established at a concentration equal to the natural background concentration, WAC 173-340-700(6)(d). Therefore, the groundwater cleanup level for arsenic for protection of surface water and drinking water will be 5 ug/L.

Chromium has a cleanup level of 10 ug/L, which is based on the National Toxics Rule (NTR) 40 CFR 131 and WAC 173-201A for a chronic exposure to aquatic life. This chromium concentration is based on the assumption that hexavalent chromium is present in the total chromium results. WAC 173-201A also establishes the water quality criterion for lead at 1.85 ug/L. Similar to arsenic, this concentration is less than the natural background concentration for lead in the state of Washington. The cleanup level for lead will be set at the established background concentration of 5 ug/L. The manganese cleanup level will be established using the Method B cleanup level for non-carcinogenic contaminants, which sets the manganese concentration at 2,240 ug/l for protection of human health.

The pH cleanup level for the Site is based by reference on the water quality criteria set forth under WAC 173-201A. The surface water criteria establish a cleanup level range of 6.5 to 8.5 standard units. The pH cleanup level is set for protection of drinking water and surface water.

A point of compliance (WAC 173-340-200) is the point or points where cleanup levels established in accordance with WAC 173-340-720 through 173-340-760 shall be attained. Once those cleanup levels have been attained at that point, a site is no longer considered a threat to human health and the environment. If a conditional point of compliance is established (see below), institutional controls must remain in place to prevent exposure where hazardous substances remain on-site above cleanup levels.

Under MTCA, the standard groundwater point of compliance is throughout a site from the uppermost level of the saturated zone extending vertically to the lowest most depth

which could potentially be affected by the Site (WAC 173-340-720(8)(b)).

Where hazardous substances remain on-site as part of the cleanup action, a groundwater conditional point of compliance, which shall be as close as practicable to the source of hazardous substances not to exceed the property boundary, may be used. If a conditional point of compliance is used, the proponent shall demonstrate that all practicable methods of treatment are utilized in the cleanup action (WAC 173-340-720(8)(c)). A conditional point of compliance has been selected for use at the Site, as explained in Section 7.1 below. Groundwater outside of the subsurface hydraulic barrier will be subject to this conditional point of compliance.

The remedy selected for the Site includes groundwater treatment, as explained in Section 7.0. Groundwater will pass through an engineered subsurface treatment system where it will be treated and then discharged through an engineered effluent outfall to Sullivan Creek. When it passes through this system, it loses its character as groundwater. The treated water will therefore have to meet surface water cleanup levels instead of groundwater cleanup levels. Since groundwater cleanup levels were developed to be protective of surface water at this Site, they will also be used as surface water cleanup levels. In addition, as also described in Section 7.1, groundwater that has undergone treatment and is discharged to surface water through an effluent outfall will be subject to a point of compliance for surface water cleanup levels pursuant to WAC 173-340-730(6)(a).

### **5.3 Overall Site Risk**

Arsenic is considered the only carcinogenic substance at the Site. Since the cleanup level is set at background, a cancer risk was not calculated for the Site. The hazard index for the Site is one. This is derived from a combination of risk associated with the five indicator metals and pH in groundwater. The hazard quotient calculations are presented as Table 3. The effects from non-carcinogenic substances were used to determine the hazard index by summation of the hazard quotients. The highest calculated hazard index is 1 for manganese due to neurotoxicity.

## **6.0 REMEDIAL ALTERNATIVES**

The FS identified six alternatives for groundwater remediation and each alternative involves groundwater treatment. In addition to groundwater treatment, two alternatives involve source control while a third alternative involves partial source removal. The alternatives are as follows:

- Permeable Treatment Wall
- Groundwater Control
- Additional Source Control
- Partial Source Removal
- Funnel and Gate Treatment
- Partial Additional Source Control

The alternatives were developed to comply with MTCA including other applicable or relevant and appropriate requirements (ARARs), and to provide protection of human health and the environment. The six cleanup alternatives involve groundwater treatment.

### **6.1 Alternative 1 – Permeable Treatment Wall**

Alternative 1, the Permeable Treatment Wall, utilizes the same technology tested in the Pilot Groundwater Treatment System and extends the treatment wall to the north along the east side of State Route 31 (Figure 3). The preliminary design includes treatment wall sections that would be linked with barrier wall panels. The barrier panels would direct CKD affected groundwater to the treatment zones. The treatment zones would contain perforated plastic pipes encasing silicone tubing. The tubing would be used to diffuse carbon dioxide into groundwater, resulting in carbonic acid production. The carbonic acid would neutralize the high pH water, which in turn would reduce the soluble arsenic concentrations in groundwater. The complexes formed by the pH adjustment would precipitate in the soil matrix. Based on computer modeling, the precipitates will remain stable. In order to address the possibility that CKD affected groundwater may bypass the treatment zone, a limited number of extraction wells would be installed to extract the errant groundwater and route it back to the treatment zone.

### **6.2 Alternative 2 – Groundwater Control**

Groundwater Control, Alternative 2, combines groundwater extraction wells with the existing pilot Permeable Treatment Wall. Groundwater modeling suggests that 16 extraction wells pumping between two to four gallons per minute would provide capture for the groundwater contaminant plume (Figure 4). The extracted groundwater would be treated above-ground with a combination of carbon dioxide for pH neutralization and ferric chloride as a flocculent to collect metal-bearing solids. Following treatment to meet cleanup levels, the treated groundwater would be discharged to Sullivan Creek in accordance with a National Pollutant Discharge Elimination System (NPDES) permit.

### **6.3 Alternative 3 – Additional Source Control**

Alternative 3, which is considered an additional source control option, involves the installation of a vertical subsurface barrier located hydraulically upgradient of the Closed CKD Pile (Figure 5). The barrier would be constructed of low-permeability bentonite slurry and would intercept and direct water away from the Closed CKD Pile. Conceptual design suggests dewatering wells are needed upgradient of the slurry wall to capture and direct groundwater around the Closed CKD Pile. The slurry wall would key into the underlying low-permeability soil that ranges from approximately 60 to 120 feet deep. The slurry wall and dewatering wells would provide some source control by limiting the groundwater that contacts the CKD. This source control alternative would result in less CKD-affected groundwater than without such source control, but would not eliminate it. CKD-affected groundwater would continue to be generated from the inundated areas that are discussed in Alternative 4, as well as from groundwater that flows through potential imperfections in the slurry wall. Since CKD-affected groundwater would continue to be

generated, this alternative would need to include downgradient groundwater extraction and aboveground treatment components to address the groundwater plume.

#### **6.4 Alternative 4 – Partial Source Removal**

Alternative 4 is considered a source control option by using a partial source (i.e., CKD) removal remedy. Ecology views this alternative as a permanent remedy for the Site. Ecology has identified two inundated areas where groundwater encounters the bottom of the Closed CKD Pile. The first of the areas is located at the toe of the Closed CKD Pile in the area of monitoring well MW-3 (Figure 6). Due to concerns regarding slope stability, sheet piles would have to be used to stabilize and segregate the previously identified area at the toe of the Closed CKD Pile. An estimated 5,500 cubic yards of CKD would be removed in this area to eliminate the CKD that is contact with groundwater. The second area that contacts groundwater is located near borings B-3 to B-7 (Figure 3). In order to access these materials, a portion of the engineered cover would need to be exposed and laid back, thus providing access for excavation of the CKD using conventional slope back techniques. CKD removal in this area would involve removing approximately 260,000 cubic yards of overlying CKD to access the inundated CKD (Ecology, 1997). This alternative would require the construction of a five-acre temporary storage area to stage the excavated CKD during excavation and backfilling. Engineered fill would be placed into the excavation to a predetermined height above the high groundwater elevation and overlaid with geotextile and a low-permeability soil layer. The remainder of the excavation would be backfilled with the temporarily stockpiled CKD. Excess CKD would be transported off-site for proper disposal. Following CKD replacement to grade, the cover system would be repaired by replacement and integration of cover system components.

#### **6.5 Alternative 5 – Funnel and Gate Treatment**

A funnel and gate system coupled with groundwater treatment comprises Alternative 5. The funnel component of the alternative would consist of a subsurface hydraulic barrier wall downgradient of the Closed CKD Pile that intercepts and directs groundwater toward a treatment corridor (Figure 7). A gravel drainage layer located immediately upgradient and within the interior of the barrier wall would provide a higher permeability flow path for groundwater as it enters the funnel. After groundwater is intercepted and funneled toward the gate, it would encounter an in-situ treatment corridor. The corridor treatment would consist of a series of permeable treatment walls. The walls would utilize the treatment technologies discussed in Alternative 1. The treated groundwater would eventually discharge to Sullivan Creek through a subsurface engineered effluent outfall in accordance with a NPDES permit.

#### **6.6 Alternative 6 – Partial Additional Source Control**

Alternative 6 combines two cleanup concepts (Figure 8). The first component is source control, which is provided with a gravity drain. The drain would be installed along the southern edge of the Closed CKD Pile in order to capture and redirect unaffected

groundwater away from the Closed CKD Pile. This technique would allow the interception and conveyance of water that would eventually come in contact with the CKD. Conceptually, the reduction in groundwater that contacts the CKD will result in a decrease in contamination production and, therefore, the amount of groundwater that will require treatment.

The second portion of the cleanup alternative is the funnel and gate treatment system described in Section 6.5 – Alternative 5. If the gravity drain picks up contaminated groundwater, it would have the ability to discharge to the treatment system.

## **6.7 Cleanup Action Evaluation Criteria**

The criteria used to evaluate cleanup actions are presented in WAC 173-340-360. All cleanup actions must meet the following four threshold requirements.

- Protect human health and the environment
- Comply with cleanup standards set forth in WAC 173-340-700 through 760
- Comply with applicable state and federal laws
- Provide for compliance monitoring

Other requirements for cleanup actions that meet threshold criteria include the following:

- Use permanent solutions to the maximum extent practicable
- Provide for reasonable restoration time frame
- Consider public concerns raised during the public comment period on DCAP

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

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

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

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

### ***Groundwater Cleanup Action Requirements***

At sites with contaminated groundwater, WAC 173-340-360(2)(c) requires that the cleanup action meet certain additional requirements. For non-permanent groundwater cleanup actions, the regulation requires that the following two requirements be met:

- 1) Treatment or removal of the source of the release shall be conducted for liquid wastes, areas of high contamination, areas of highly mobile contaminants, or substances that can't be reliably contained; and
- 2) Groundwater containment (such as barriers) or control (such as pumping) shall be implemented to the maximum extent practicable.

### ***Cleanup Action Expectations***

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

- Treatment technologies will be emphasized at sites with liquid wastes, areas with high concentrations of hazardous substances, or with highly mobile and/or highly treatable contaminants;
- To minimize the need for long-term management of contaminated materials, hazardous substances will be destroyed, detoxified, and/or removed to concentrations below cleanup levels throughout sites with small volumes of hazardous substances;
- Engineering controls, such as containment, may need to be used at sites with large volumes of materials with relatively low levels of hazardous substances where treatment is impracticable;
- To minimize the potential for migration of hazardous substances, active measures will be taken to prevent precipitation and runoff from coming into contact with contaminated soils or waste materials;
- When hazardous substances remain on-site at concentrations which exceed cleanup levels, they will be consolidated to the maximum extent practicable where needed to minimize the potential for direct contact and migration of hazardous substances;
- For sites adjacent to surface water, active measures will be taken to prevent/minimize releases to that water; dilution will not be the sole method for demonstrating compliance;
- Natural attenuation of hazardous substances may be appropriate at sites under certain specified conditions (see WAC 173-340-370(7)); and



- Cleanup actions will not result in a significantly greater overall threat to human health and the environment than other alternatives.

## **6.8 Evaluation of Proposed Remedial Alternatives**

The remedial alternatives proposed in the feasibility study were evaluated according to the criteria set forth in WAC 173-340-360 and discussed in the prior section of this report. The six alternatives meet the threshold requirements to varying degrees. The alternatives will be listed with high, moderate or low ranking for protectiveness of human health and the environment.

Each alternative is considered protective of human health and the environment since each captures and treats groundwater to meet established Site cleanup levels at the applicable point of compliance. Each alternative is compliant with applicable federal and state requirements and provides for compliance monitoring. Therefore, each alternative meets the threshold criteria set forth in WAC 173-340-360(2)(a).

The second component used to evaluate alternatives is WAC 173-340-360 (2)(b) (“Other Requirements”), which includes requirements that remedies use permanent solutions to the maximum extent practicable, reflect the consideration of public concerns, and provide for a reasonable restoration time frame. The following evaluation assumes that Alternative 4 is a permanent solution for the Site. For the purpose of evaluation, Ecology considers the public concern for each alternative to be equivalent and will rely on actual public input to gauge public concern. In addition, each alternative provides for compliance monitoring.

### **6.8.1 Alternative 1**

Alternative 1 extends the permeable treatment wall to intercept contaminated groundwater and treat it with diffused carbon dioxide. The permeable treatment wall alternative meets the MTCA cleanup action threshold criteria. This alternative has been given a moderate degree of permanence since it will require groundwater treatment well into the future. A longer restoration time frame would be realized since no source removal will be conducted. Since the technology has been installed and demonstrated at the Site, the implementability of the alternative is known and can be completed. The long-term effectiveness of this alternative is high since the same treatment technology has been demonstrated on-site for over two years. The short-term risks are that workers may be exposed to high pH water during construction. The remainder of the installation has typical construction related risks that can readily be addressed with proper safety precautions.

### **6.8.2 Alternative 2**

Alternative 2 utilizes the current pilot treatment wall with pump and treat technology. This alternative has been given a moderate degree of permanence since it will require groundwater treatment well into the future. A longer restoration time frame would be

realized since no source removal will be conducted. Pump and treat technology can be implemented at the Site from both a technical and administrative standpoint. However, pump and treat at the Site presents challenges because of the proximity to Sullivan Creek. The short-term risks associated with the alternative are that workers may be exposed to high pH water during well construction. Workers will also be exposed to treatment solids from the aboveground treatment system.

#### 6.8.3 Alternative 3

Alternative 3 is the additional source control alternative that diverts groundwater around the Closed CKD Pile. A pump and treat system would augment the source control technology. A moderate to high degree of permanence was assigned to this alternative since a source control component is included as part of the remedy. Since source removal would not be conducted, a longer restoration time frame is envisioned. However, a shorter restoration time frame may be realized versus the groundwater treatment-only alternatives since hydraulic isolation would greatly reduce the volume of CKD affected groundwater that requires treatment. As discussed in Alternative 2, pump and treat technology can be implemented administratively and technically at the Site.

The technical implementation of source control around the Closed CKD Pile presents many challenges. The most critical aspect of these challenges is the slurry wall installation along the southern edge of the Closed CKD Pile. Given historic landslides in this area and the hill slope and pile interface, slurry wall installation would be very difficult. Due to slope stability issues, short-term risks include the potential to activate landslides as well as risks discussed regarding pump and treat systems.

#### 6.8.4 Alternative 4

Partial source removal is considered a permanent remedy since source control is being utilized. For the purpose of the FS, Ecology requested that Alternative 4 be considered a permanent remedy so other alternatives could be compared for evaluation. In this draft cleanup action plan, this alternative is considered a permanent remedy. Groundwater treatment will be required for a period of time until the system reaches equilibrium. Ecology requested that a five-year and indefinite period be evaluated in the FS in order to assess the required groundwater treatment. As discussed below, cost and implementation considerations disfavor this alternative.

The alternative would be very difficult to implement, since Site constraints and material handling would present many challenges. Stability and safety issues are the main factors associated with handling saturated CKD. While the alternative is considered technically implementable, the difficulties associated with its implementation, including acquiring additional land for temporary CKD storage, make the alternative very difficult at this location. The short-term risks include the potential to activate landslides, the partial removal of the cover system and handling of CKD, and the aforementioned risks associated with pump and treat systems.

#### 6.8.5 Alternative 5

Alternative 5 ranked moderate for permanence, since it will require groundwater treatment for an indefinite period. A longer restoration time frame would be realized since no source removal will be conducted. The funnel and gate system can be implemented at the Site from both a technical and administrative standpoint. Additional caution will be required during funnel wall emplacement because of the proximity of utilities. The treatment system aspect of the alternative has been demonstrated at the Site. As a result, the implementability of the alternative is known and it can be completed. The long-term effectiveness of this alternative is high. The primary short-term risk is that workers may be exposed to high pH water during construction. The remainder of the installation has typical construction related risks that can readily be addressed with proper safety precautions.

#### 6.8.6 Alternative 6

Alternative 6 ranked moderate to high for permanence since the alternative provides a source control component in addition to the groundwater treatment component. Alternative 6 can be implemented at the Site from both a technical and administrative standpoint. The treatment system technology has been demonstrated at the Site. The long-term effectiveness of this alternative is expected to be high. The primary short-term risk is that workers may be exposed to high pH water during construction. The remainder of the installation has typical construction related risks that can readily be addressed with proper safety precautions. Alternative 6 balances the applicable remedy selection criteria in a way that meets cleanup standards and provides a significant degree of permanence by reducing the toxicity and mobility of metals in groundwater.

### **7.0 SELECTED CLEANUP ACTION**

Ecology is selecting Alternative 6 presented in the FS, as modified below. The selected cleanup action addresses Site groundwater contamination. The cleanup action plan meets the threshold requirements and was given preference for treating groundwater and providing source control.

Groundwater contamination from the Closed CKD Pile continues to be present from the pile flowing beneath Highway 31 to Sullivan Creek. The highest beneficial use of Site groundwater is as a drinking water source. The groundwater contaminant plume extends from the Closed CKD Pile and flows northeast for approximately 360 feet and discharges to Sullivan Creek. The metals contaminant plume lies within the boundary of the pH plume. In addition to providing treatment of contaminated groundwater, the selected groundwater remedy will provide a source control component by capturing groundwater along the southern edge of the Closed CKD Pile and routing the water to the area east of State Route 31. Depending on the captured groundwater quality, the water may either be directed toward the treatment system or allowed to discharge below ground.

Additional monitoring wells, the number of which will be determined during the Engineering Design Report, will be completed to assess the efficacy of the source control gravity drain. The newly installed wells will be monitored as part of the performance monitoring plan. The Draft Engineering Design Report will include a plan to evaluate the source control provided by the gravity drain. To monitor the treatment system, groundwater samples will be collected from new performance monitoring wells installed with the treatment system. In addition, groundwater samples will be collected from current monitoring wells MW-12, PM-1, PM-5, PM-15, and PM-19, as well as new performance monitoring wells installed with the treatment system. The wells will be sampled on a quarterly basis until such time a less frequent schedule is warranted. A more frequent sampling schedule is anticipated prior to and immediately following system start up.

The samples should be analyzed for pH and arsenic, chromium, lead, and manganese. Additional analysis to meet the NPDES discharge permit requirements will also be necessary.

## **7.1 Point of Compliance**

A groundwater conditional point of compliance may be approved where it can be demonstrated that it is not practicable to meet cleanup levels throughout a site. In addition, if hazardous substances remain on-site as part of the cleanup action, a groundwater conditional point of compliance, which shall be as close as practicable to the source of hazardous substances not to exceed the property boundary, may be approved. Since Lehigh owns the property on both sides of State Route 31 up to Sullivan Creek and since it is not practicable to meet cleanup levels in groundwater throughout the Site because the Closed CKD Pile will remain in place, a conditional compliance is appropriate. If a groundwater conditional point of compliance is used, the proponent shall demonstrate that all practicable methods of treatment are to be utilized in the cleanup action (WAC 173-340-720(8)(c)). The selected alternative meets the criteria since containment and treatment will be utilized as part of the cleanup action. A groundwater conditional point of compliance for all groundwater outside of the subsurface hydraulic barrier will be used and established at the groundwater/surface water interface. Monitoring will be used to establish compliance with this conditional point of compliance granted under WAC 173-340-720(8)(d)(i).

Groundwater that passes through the treatment system will be discharged to surface water through a subsurface engineered effluent outfall. This treated effluent will be subject to an NPDES permit and a point of compliance for surface water cleanup levels pursuant to WAC 173-340-730(6)(a).

## **7.2 Institutional Controls**

Institutional controls are measures undertaken to limit or prohibit activities that may interfere with the cleanup action or result in the exposure to hazardous substances at a site. Institutional controls are required where cleanup actions result in residual

concentrations of hazardous substances exceeding cleanup levels established for a site. These controls may not be used as a substitute for a cleanup that is technically possible. Since the cover system on the Closed CKD Pile and portions of the groundwater remedy utilize a containment technology, institutional controls will be required. The institutional controls for the cover system on the Closed CKD Pile have already been established through an Ecology approved Post-Closure Care and Maintenance Plan. These institutional controls will be continued as part of the selected alternative.

Groundwater contamination occurs beneath the Closed CKD Pile and flows beneath State Route 31 to property east of the roadway. Lehigh has purchased the property east of the highway and therefore controls land ownership overlying the groundwater plume to Sullivan Creek. The institutional control requirements are set forth in WAC 173-340-440. The following institutional controls that prohibit and/or limit groundwater use within the groundwater contamination plume will be required, as incorporated into a restrictive covenant to be filed with the office of the Pend Oreille County Auditor:

- 1) No groundwater may be taken from the parcel, except for purposes related to the Remedial Action, such as groundwater monitoring.
- 2) Lehigh shall maintain and operate the groundwater remediation system installed at the Site until such time it is agreed by Ecology and Lehigh that system operation is no longer required. This will occur when three years of quarterly monitoring data show that cleanup levels have been met in groundwater at one or more locations agreed upon by Ecology and Lehigh before it enters the treatment zone.
- 3) Lehigh shall maintain one or more signs warning that groundwater beneath this parcel contains elevated levels of metals and pH. A suitable barrier that restricts unauthorized access to the groundwater remediation system shall be maintained.
- 4) Lehigh shall provide a financial assurance mechanism to provide for the continued operation and maintenance of the cleanup action, which includes monitoring and maintaining institutional controls and operation and maintenance of the Closed CKD Pile.

### **7.3 Periodic Review**

WAC 173-340-420 states that at sites where a cleanup action requires an institutional control, a periodic review shall be completed no less frequently than every five years after the initiation of a cleanup action. Since the waste materials remain on-site and institutional controls will be required, five-year reviews shall take place at this Site. Monitoring data shall be reviewed to continue to assess the effectiveness of the groundwater contamination treatment system. If data do not indicate that the treatment system has the capacity to treat contaminant concentrations to meet cleanup levels and meet the requirements of the NPDES permit for discharge to Sullivan Creek, then further remedial action may be considered.

## **8.0 EVALUATION OF THE CLEANUP ACTION USING MTCA CRITERIA**

The selected remedy is evaluated using the MTCA criteria set forth in WAC 173-340-360, as follows:

### **8.1 Protection of Human Health and the Environment**

Groundwater is the contaminated medium and focus of treatment at the Site. The exposure routes identified at the Site are via direct contact and ingestion of groundwater. The in-situ treatment of contaminated groundwater will reduce the risk from direct contact downgradient of the treatment wall and provide for protection of surface water. Institutional controls restricting groundwater withdrawal and use will limit exposure via ingestion and dermal contact.

### **8.2 Compliance with Cleanup Standards**

Contaminated groundwater will be treated by in-situ technology involving the interception and direction of contaminated groundwater to a treatment corridor in the subsurface. The groundwater will be treated to meet cleanup levels at a point of compliance for surface water cleanup levels pursuant to WAC 173-340-730(6)(a). Groundwater outside of the subsurface hydraulic barrier will meet groundwater cleanup levels at a conditional point of compliance located at the groundwater/surface water interface. Institutional controls will be part of this cleanup action since the Closed CKD Pile will remain in-place with the cover system and contaminated groundwater from the Closed CKD Pile will flow beneath State Route 31 to the treatment system.

### **8.3 Compliance with Applicable State and Federal Laws**

The cleanup action for this Site complies with applicable state and federal laws. The applicable state and federal laws for the implementation of the cleanup action are identified in Table 4. Local laws, which can be more stringent, will govern actions when they are applicable.

### **8.4 Compliance Monitoring**

Compliance monitoring is divided into three categories, which are protection, performance, and confirmational (WAC 173-340-410). Protection monitoring is designed to protect human health and the environment during construction and the operation and maintenance tasks for the cleanup action. Performance monitoring confirms that the cleanup action has attained cleanup and/or performance standards.

Confirmational monitoring confirms the long-term effectiveness of the cleanup action once cleanup standards have been achieved or other performance standards have been attained. Compliance monitoring will be conducted in accordance with a Compliance Monitoring Plan, which is to be developed. The Compliance Monitoring Plan will be developed under the terms of Exhibit C (Scope of Work and Schedule) to a consent

decree. In addition, monitoring of the Closed CKD Pile engineered cover system is described in the Post-Closure Care and Maintenance Plan previously developed for the Closed CKD Pile (to be attached as Exhibit G to a consent decree). The monitoring requirements in Section 5 of Exhibit G will be superseded by the requirements of the Compliance Monitoring Plan developed pursuant to Exhibit C, Scope of Work and Schedule

## **8.5 Use Permanent Solutions to the Maximum Extent Practicable**

A permanent solution is one in which cleanup standards can be met without further action being required. Ecology believes that Alternative 4 (partial source removal) may provide a permanent solution for the Site. There are serious obstacles to implementation of Alternative 4, however, and even after implementation, groundwater treatment would still be required for some time. Alternative 6, the selected remedy, provides a moderate to high degree of permanence and can be readily implemented.

### **8.5.1 Protection of Human Health and the Environment**

The remedy selected for groundwater is considered protective of human health and the environment. The groundwater remedy is considered protective since it will contain and treat contaminated groundwater. Cleanup levels will be met at the applicable points of compliance for groundwater and surface water.

The source control aspect of the alternative will reduce the amount of groundwater requiring treatment. Institutional controls will prohibit the withdrawal and use of the contaminated groundwater at the Site prior to its treatment. Achieving groundwater and surface water cleanup standards will be assessed as part of the review process up to the five-year review required under WAC 173-340-420. If groundwater and surface water cleanup levels have not been met at their respective points of compliance, additional cleanup action may be required. Performance monitoring will be completed according to the schedules established pursuant to Section 8.4 above.

### **8.5.2 Long-Term Effectiveness**

The long-term effectiveness of the groundwater remedy will be assessed as source control reduces the amount of groundwater requiring treatment. The in-situ groundwater treatment system is expected to lower pH levels to within the cleanup level range of 6.5 to 8.5 s.u., which will result in metals removal to below the established cleanup levels.

### **8.5.3 Short-Term Effectiveness**

Risks associated with the cleanup action in the short term are the potential exposure of workers to the contaminated groundwater during excavation and installation of the groundwater treatment system. Institutional controls to prevent contact with contaminated groundwater will minimize the short-term risks while the groundwater remedy is implemented. Worker health and safety will be addressed as part of the Draft

Engineering Design to comply with the appropriate regulations and to satisfy the protection monitoring requirements.

#### 8.5.4 Permanent Reduction of Toxicity, Mobility, and Volume

Groundwater source control with the gravity drain will reduce the toxicity, mobility, and volume of contaminants in groundwater. Groundwater treatment will reduce the contaminants in groundwater to meet cleanup levels at the point of compliance for surface water cleanup levels pursuant to WAC 173-340-730(6)(a).

#### 8.5.5 Implementability

The selected cleanup action can be readily implemented since it involves the use of conventional remediation technologies and innovative technologies that have been demonstrated at the Site. It is anticipated that the conceptual design of Alternative 6 may be modified for final implementation. The remedial design will more fully evaluate and describe how Alternative 6 will be constructed and operated.

#### 8.5.6 Cost

The cost provided in the FS for the selected alternative ranges between 2.4 to 3 million dollars for capital costs. The projected annual operation and maintenance (O&M) costs for the groundwater treatment and monitoring is \$150,000. Costs developed using a seven-percent interest rate and an O&M life of 30 years yielded a cost estimate of 4.5 to 5.1 million dollars for the alternative.

### **8.6 Provide Reasonable Restoration Time Frame**

The proposed cleanup action will provide source control measures by intercepting groundwater and directing it away from the Closed CKD Pile. As a result, it will reduce the amount of contamination generated. While a reduction in CKD-affected groundwater will be realized by the gravity drain, groundwater treatment will still be necessary for an indefinite period. However, restoration to meet cleanup levels at the surface water point of compliance should occur once the cleanup action is fully implemented. Full cleanup action implementation will include a two-year Optimization Phase. Additionally, the discharge is subject to the requirements of a NPDES permit and a mixing zone under WAC 173-201A may be considered. Details of the monitoring program, including parameters and frequency, will be specified in the Compliance Monitoring Plan.

Monitoring and periodic review will provide an assessment tool for the cleanup action. Small areas within the footprint of the current contaminated groundwater plume will be outside of the subsurface hydraulic barrier after it is constructed. These remnant plume areas will not be captured by the barrier after its placement and will continue to discharge to Sullivan Creek until they have been exhausted. A conditional point of compliance for these remnant plume areas and all groundwater outside of the subsurface hydraulic barrier will be established at the groundwater/surface water interface, with



compliance monitoring to be established within groundwater as close to the groundwater/surface water interface as practicable. Monitoring wells will serve as the conditional points of compliance and the number and location of the wells will be discussed in the Engineering Design Report. As specified in WAC 173-340-720(8)(d)(i)(C), no mixing zone is available for this groundwater discharge. Ecology recognizes that the discharge from these remnant plume areas represents only a small fraction of the current contaminant loading from this Site. Therefore, a restoration time frame for this discharge will be evaluated during the five-year review. A declining trend in concentration must be observed at the points of compliance for the remnant plume during the review. Following the first five-year review, Ecology and Lehigh will determine whether evaluation tools such as modeling and statistical analysis will be necessary to evaluate the groundwater discharge. In the event a groundwater contaminant reduction consistent with a reasonable restoration time frame is neither observed nor predicted with available evaluation tools, Ecology will, consistent with WAC 173-340-420, consider the necessity of additional remedial action to address contaminated groundwater outside of the subsurface hydraulic barrier.

## **8.7 Public Participation and Community Acceptance**

A public comment period will be held to allow the public and parties affected by the cleanup action an opportunity to provide comment on this document. Public comments and concerns will be addressed in a responsiveness summary and incorporated as appropriate in the final cleanup action plan.

**TABLE 1**  
**LEHIGH CEMENT COMPANY**  
**CLOSED CKD LANDFILL**  
**DRAFT CLEANUP ACTION PLAN**  
**INDICATOR SUBSTANCE SCREENING**

CONTAMINANT	Frequency of Detection	Maximum Concentration, ug/L	Method B Cleanup Level	Basis	Screening Results
<b>arsenic</b>	<b>0.63</b>	<b>752</b>	<b>5</b>	<b>Background</b>	<b>Indicator</b>
cadmium	0	0	0.25	CWA	no detection
<b>chromium (total)</b>	<b>0.5</b>	<b>1080</b>			<b>Indicator</b>
chromium III			74	CWA	
<b>chromium VI</b>			<b>10</b>	<b>Ch. 173-201A, NTR</b>	
copper	0	0	8.92	Ch. 173-201A	no detection
<b>lead</b>	<b>0.43</b>	<b>1470</b>	<b>5</b>	<b>Background</b>	<b>Indicator</b>
<b>manganese</b>	<b>0.99</b>	<b>15300</b>	<b>2,240</b>	<b>Method B (NCAR)</b>	<b>Indicator</b>
mercury	0		0.1	PQL	no detection
zinc	0.17	2	82.27	Ch. 173-201A	<cleanup level
<b>pH</b>	<b>1</b>	<b>13.9 s.u.</b>	<b>6.5-8.5</b>	<b>Ch. 173-201A</b>	<b>Indicator</b>

CWA - Clean Water Act

NTR - National Toxics Rule

NCAR - Non-Carcinogenic

PQL - Practical Quantification Limit

TABLE 2
LEHIGH CEMENT COMPANY
CLOSED CKD LANDFILL
DRAFT CLEANUP ACTION PLAN
METHOD B CLEANUP LEVEL DEVELOPMENT

GROUNDWATER METHOD B CRITERIA FOR THE CLOSED CKD LANDFILL SITE - [WAC 173-340-720(4)(b)]														MOST STRINGENT CONCENTRATION, (ug/L)	NATURAL BACKGROUND	PQL	METHOD B CLEANUP LEVEL, (ug/L)	BASIS	
CONTAMINANT	GROUNDWATER				MTCA METHOD B FORMULA	SURFACE WATER													
	POTABLE GROUNDWATER ARARS					SURFACE WATER ARARS						MTCA METHOD B FORMULA							
	Federal MCL	State MCL	Federal MCL Goal (for noncarcinogens)	MTCA Risk @ MCL/HQ at MCL		AQUATIC LIFE				HUMAN HEALTH									
						Ch. 173-201A		CWA Section 304		NTR (40 CFR 131)		CWA Section 304	NTR (40 CFR 131)						
arsenic	10	10	Not applicable	1.72x10-42	0.058/CAR	Acute 360	Chronic 190	Acute 340	Chronic 150	Acute 360	Chronic 190	0.018	0.018	0.098/CAR	0.018	5	2 (SW7060)	5	Background CWA
cadmium	5	5	5	0.62	8/NCAR	2.73*	0.84*	2**	0.25**		3.7	1		20/NCAR	0.25		0.1 (SW7131)	0.25	
chromium (total)	100	100	100	2.1													5 (SW 6010A)		CWA
chromium III					24000/NCAR	435.44*	141.25*	570**	74**	550	180			243000/NCAR	74		2 (SW7196)	74	
chromium VI					48/NCAR	15	10	16	11	15	10			486/NCAR	10		5 (SW6010A)	10	Ch. 173-201A, NTR
copper	1300 (action level)	1300 (action level)	1300	2.2	590/NCAR	13.04*	8.92**	13**	9.0**	17	11			2660/NCAR	8.92			8.92	Ch. 173-201A
lead	15	15 (action level)				47.43*	1.85*	65**	2.5**	65	2.5				2.5	5	2 (SW7421)	2.5	CWA, NTR
manganese					2240/NCAR							50			50			50	CWA
mercury	2	2	2	0.4	4.8/NCAR	2.1	0.012	1.4	0.77	2.1	0.012		0.14		0.012		0.1 (SW7470)	0.1	PQL
zinc					4800/NCAR	90.10*	82.27*	120**	120**	120	110	7400		16500/NCAR	110			82.27	Ch. 173-201A
pH							6.5-8.5		6.5-9.0						6.5 - 8.5			6.5 - 8.5	Ch. 173-201A
* Function of hardness. Values corresponds to a hardness of 75.4 mg/L.																			
** Function of hardness. Values corresponds to a hardness of 100 mg/L.																			
CWA - Clean Water Act																			
NTR - National Toxics Rule																			
NCAR - Non-Carcinogenic																			
PQL - Practical Quantification Limit																			
CAR - Carcinogenic																			

**TABLE 3**  
**LEHIGH CEMENT COMPANY**  
**CLOSED CKD LANDFILL**  
**DRAFT CLEANUP ACTION PLAN**  
**HAZARD INDEX AND CLEANUP LEVELS**

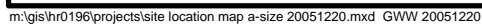
INDICATOR SUBSTANCE	METHOD B CLEANUP LEVEL, ug/l	BASIS	ADJUSTED METHOD B CLEANUP LEVEL, ug/L	PROPOSED CLEANUP LEVEL, ug/L	HAZARD QUOTIENT							UNSPECIFIED
					HEMOTOXICITY	HEPATOTOXICITY	NEPHROTOXICITY	NEUROTOXICITY	WEIGHT	MORTALITY	INCREASED ALKALINE PHOSPHATASE ACTIVITY	
arsenic	5	Background	5	5								0.21
chromium	10	NTR	10	10								
lead	5	Background	5	5								
manganese	2,240	Method B, ncar	2,240	2,240				1				
pH	6.5-8.5	WAC 173- 201A	6.5-8.5	6.5-8.5								
			Total Cancer Risk = 0									
								1				0.21

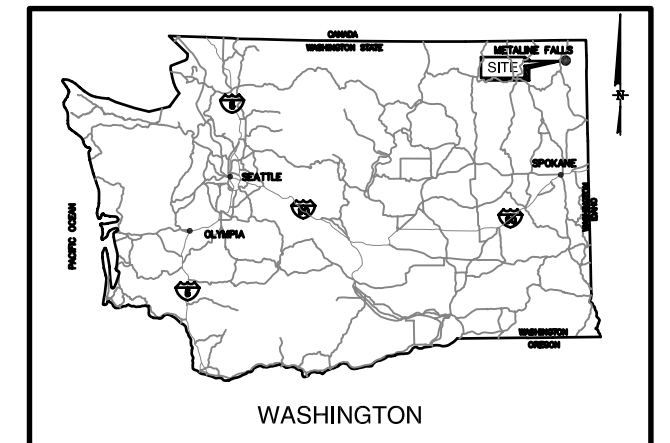
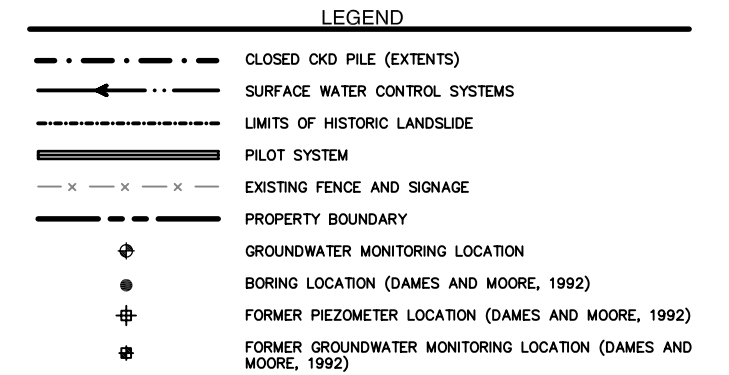
NTR - National Toxics Rule  
 NCAR - Non-Carcinogenic

**TABLE 4**  
**LEHIGH CEMENT COMPANY**  
**CLOSED CKD LANDFILL**  
**DRAFT CLEANUP ACTION PLAN**

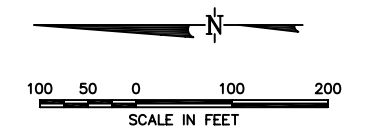
**APPLICABLE RELAVENT AND APPROPRIATE REQUIREMENTS (ARARs)**



ACTION	REFERENCE	COMMENT
Cleanup Construction	29 CFR 1910 Ch. 296-155 WAC Ch.296-62 WAC      Ch. 43.21 RCW; Ch. 197-11 WAC Ch. 173-340 WAC Ch. 173-160	Occupational Safety and Health Act Safety Standards for Construction Work Occupational Health Standards - Hazardous Waste Operations and Emergency Response Dredge and Fill Permit Rivers and Harbors Act Water Quality Certification      State Environmental Policy Act and Rules  Model Toxics Control Act Minimum Standards for Construction of Wells
Cleanup Standards	42 USC 300 Ch. 173-340 WAC 40 CFR 131  Ch. 173-201A WAC	Safe Drinking Water Act Model Toxics Control Act National Toxics Rule Clean Water Act Surface Water Quality Standards National Pollution Discharge Elimination System





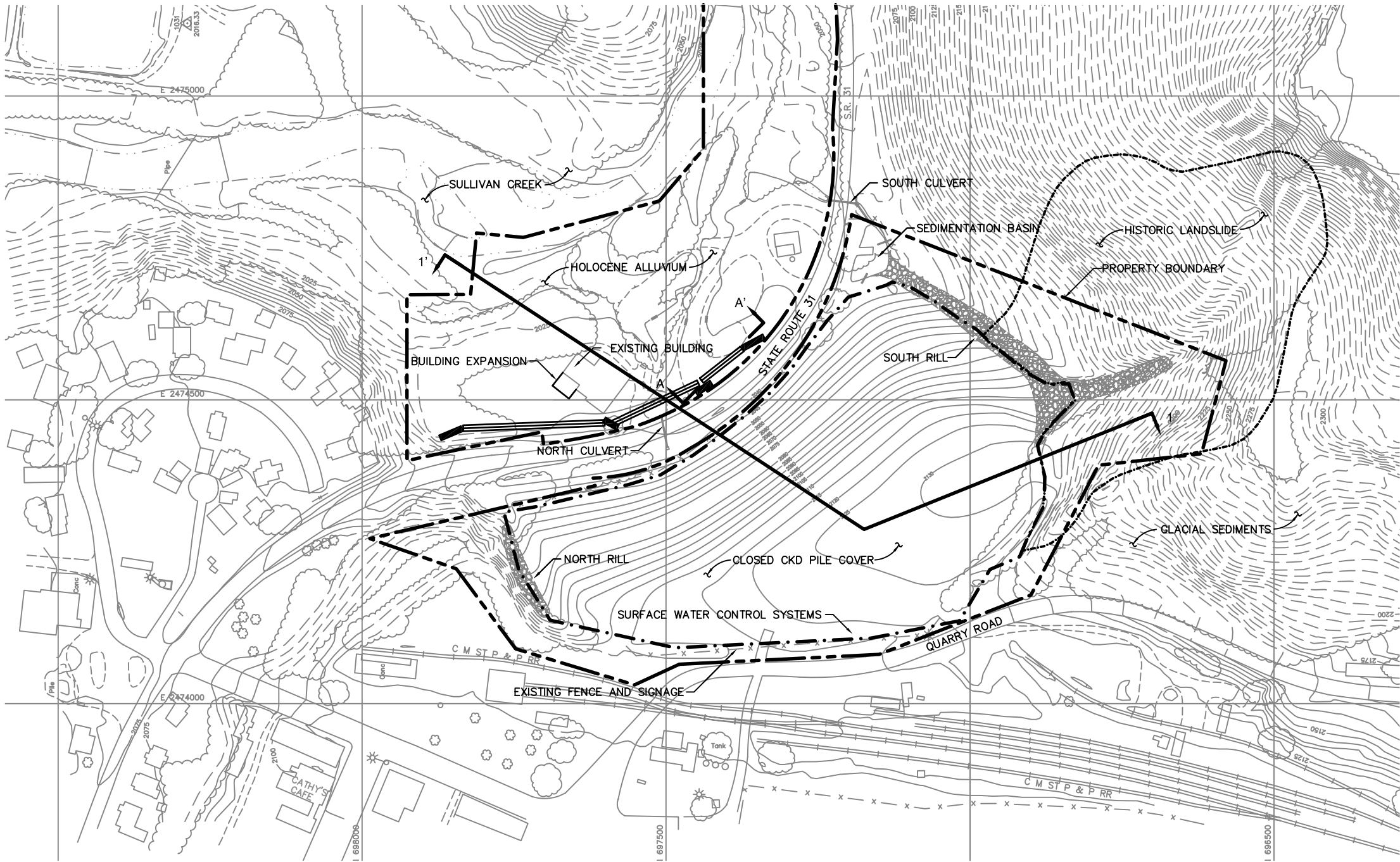
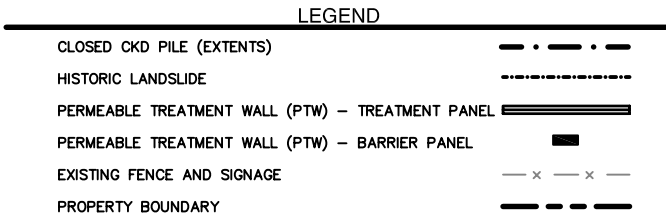
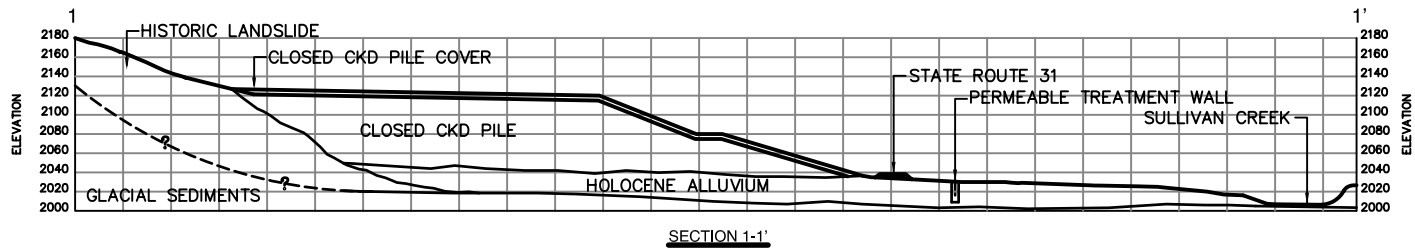
LOCATION MAP



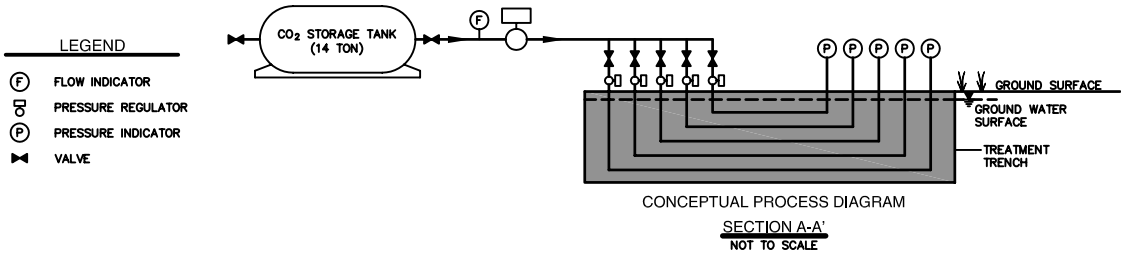
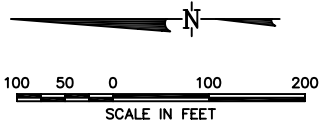
	<b>GEOSYNTEC CONSULTANTS</b> 2100 MAIN STREET, SUITE 150 HUNTINGTON BEACH, CALIFORNIA 92648 TELEPHONE: (714) 969-0800	
<b>PROJECT: LEHIGH CEMENT COMPANY – CLOSED CKD PILE SITE METALINE FALLS, WASHINGTON DRAFT CLEANUP ACTION PLAN</b>		
<b>TITLE: SITE LOCATION MAP</b>		
DATE: DECEMBER 2005	CHECKED BY: EDS	SCALE: AS SHOWN
DESIGN BY: BLP	REVIEWED BY: EDS <small>(PROJ. MGR.)</small>	JOB NO.: HR0196-12
DRAWN BY: SLB	DOCUMENT NO: DCAP	FILE NO.: 0196F166


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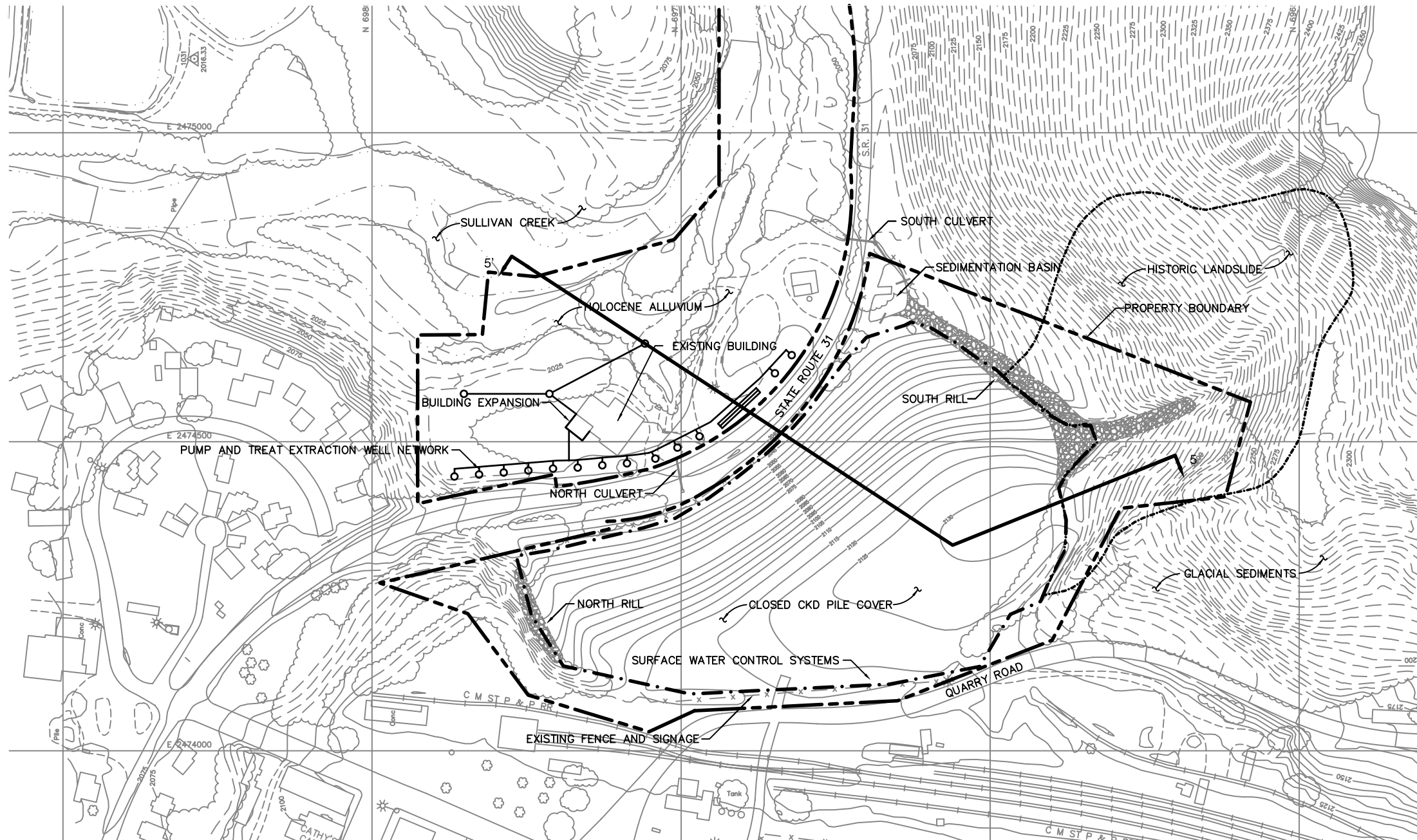
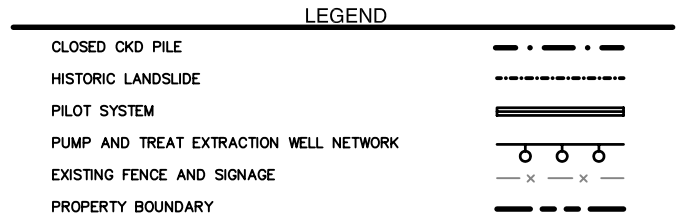
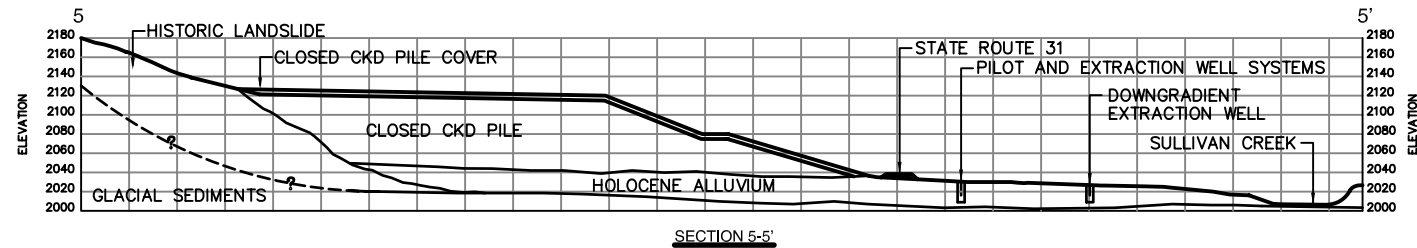
- NOTES:
- EXTRACTION WELLS TO BE ADDED TO ADDRESS GAPS IN TREATMENT, AS NEEDED.
  - THE ALTERNATIVE LAYOUT SHOWN ON THIS EXHIBIT IS INTENDED ONLY FOR THE PURPOSE OF ILLUSTRATION AND ONLY TO SUPPORT THE FEASIBILITY STUDY COMPARISON OF ALTERNATIVES. ACCORDINGLY, THE LOCATION, LAYOUT AND DETAILS OF ALTERNATIVE COMPONENTS AS SHOWN HERE WILL VARY.



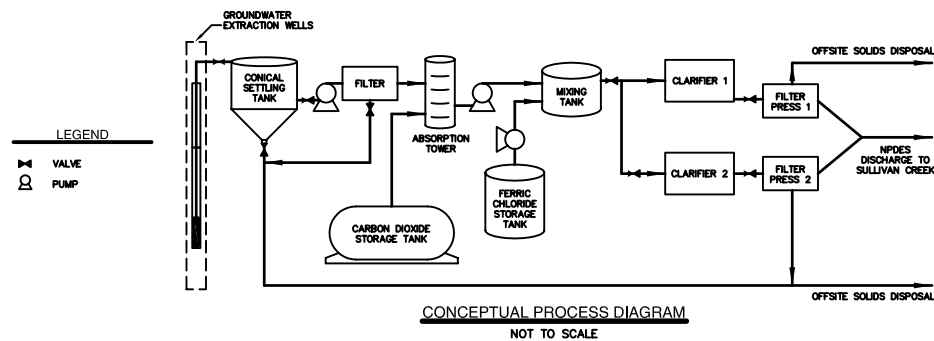
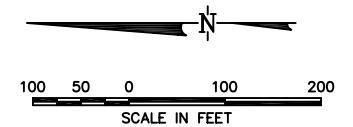
<b>LEHIGH</b> HEIDELBERGCEMENT Group		<b>GEO SYNTec CONSULTANTS</b> 2100 MAIN STREET, SUITE 150 HUNTINGTON BEACH, CALIFORNIA 92648 TELEPHONE: (714) 969-0800				
PROJECT: LEHIGH CEMENT COMPANY – CLOSED CKD PILE SITE METALINE FALLS, WASHINGTON DRAFT CLEANUP ACTION PLAN						
TITLE: <b>ALTERNATIVE #1 PERMEABLE TREATMENT WALL</b>						
DATE: DECEMBER 2005		CHECKED BY: JAC		SCALE: AS SHOWN		FIGURE NO:  <b>3</b>
DESIGN BY: EDS		REVIEWED BY: (PROJ. MGR.) TRS		JOB NO.: HR0196–12		
DRAWN BY: SLB		DOCUMENT NO:		FILE NO: 0196F161		


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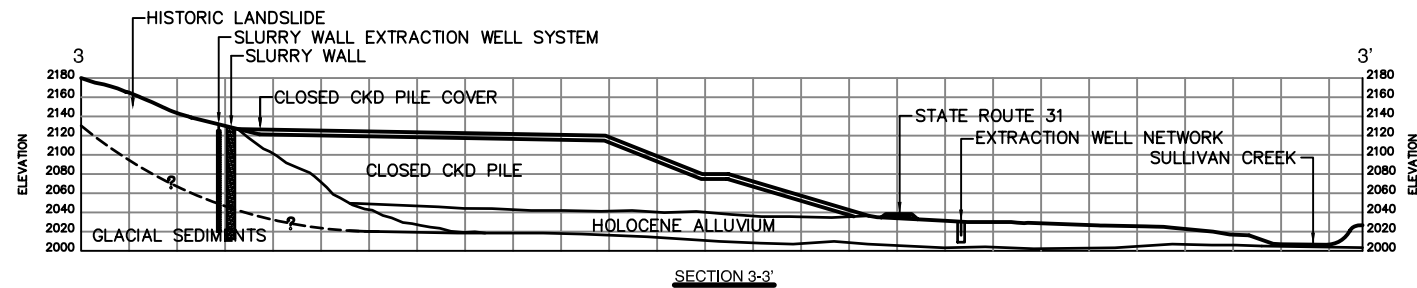


NOTE: THE ALTERNATIVE LAYOUT SHOWN ON THIS EXHIBIT IS INTENDED ONLY FOR THE PURPOSE OF ILLUSTRATION AND ONLY TO SUPPORT THE FEASIBILITY STUDY COMPARISON OF ALTERNATIVES. ACCORDINGLY, THE LOCATION, LAYOUT AND DETAILS OF ALTERNATIVE COMPONENTS AS SHOWN HERE WILL VARY.



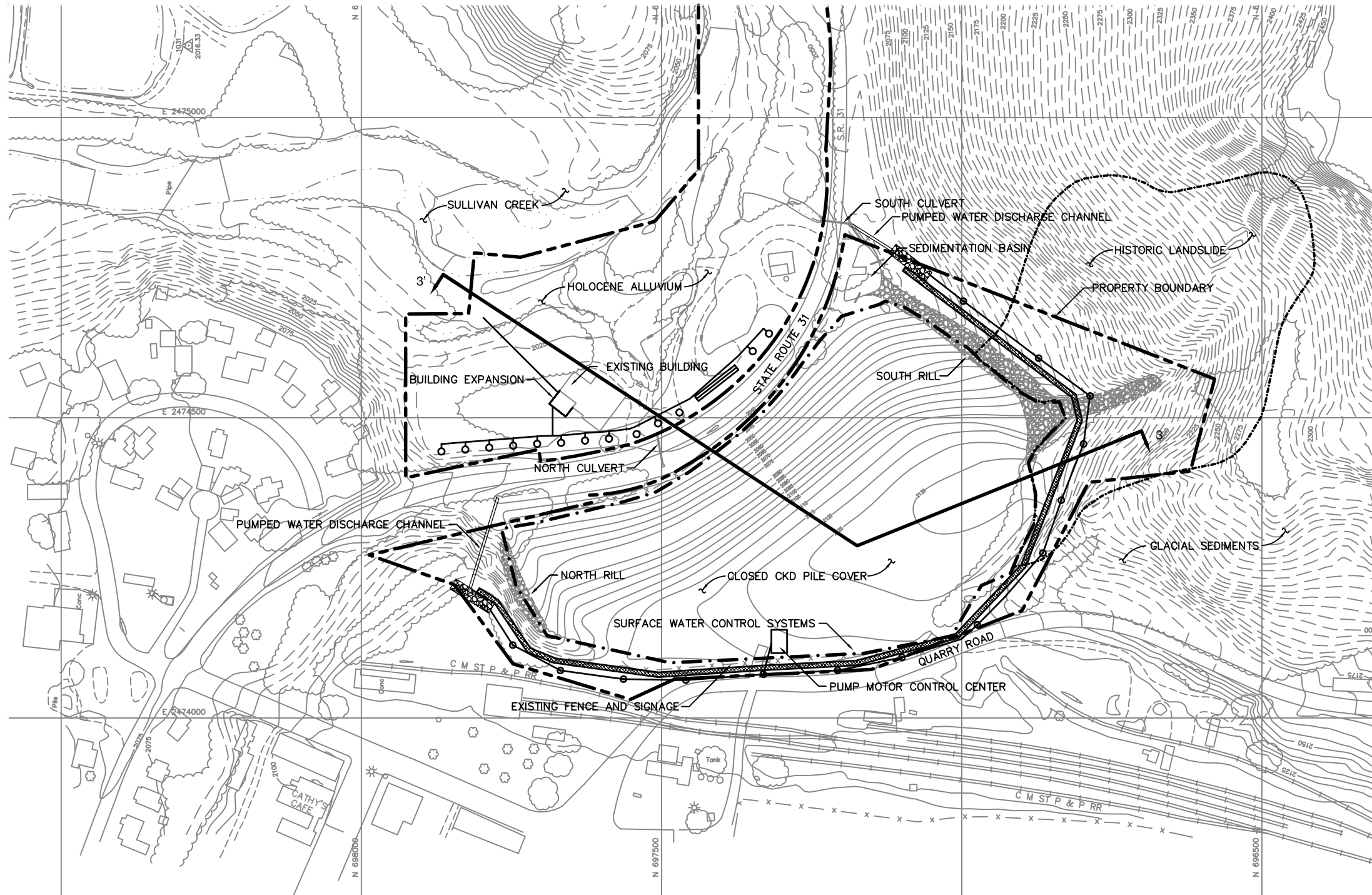
<b>LEHIGH</b> HEIDELBERGCEMENT Group		<b>GEOSYNTEC CONSULTANTS</b> 2100 MAIN STREET, SUITE 150 HUNTINGTON BEACH, CALIFORNIA 92648 TELEPHONE: (714) 969-0800			
PROJECT: LEHIGH CEMENT COMPANY – CLOSED CKD PILE SITE METALINE FALLS, WASHINGTON DRAFT CLEANUP ACTION PLAN					
TITLE: ALTERNATIVE #2 GROUNDWATER CONTROL					
DATE: DECEMBER 2005		CHECKED BY: JAC	SCALE: AS SHOWN		FIGURE NO:  4
DESIGN BY: EDS		REVIEWED BY: TRS <small>(PROJ. MGR.)</small>	JOB NO.: HR0196-12		
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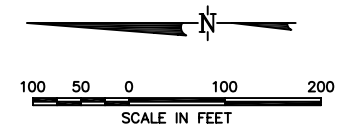




LEGEND	
CLOSED CKD PILE (EXTENTS)	— · — · —
HISTORIC LANDSLIDE	-----
PILOT SYSTEM	=====
GROUNDWATER EXTRACTION WELL NETWORK	○ ○ ○
SLURRY WALL ①	▨ ▨ ▨
SLURRY WALL EXTRACTION WELL SYSTEM ②	○ — ○
SLURRY WALL END DRAIN	▨ ▨ ▨
EXISTING FENCE AND SIGNAGE	- x - x -
PROPERTY BOUNDARY	-----

- ① THE ACTUAL ALIGNMENT OF THE SLURRY WALL AND EXTRACTION WELLS WOULD BE VARIED TO ADDRESS PHYSICAL AND CONSTRUCTION CONSTRAINTS. FOR EXAMPLE, THE SLURRY WALL MIGHT BE RELOCATED TO THE WEST OF THE QUARRY ROAD.
- ② THE PURPOSE OF THESE GROUNDWATER WELLS WOULD BE TO CONTROL GROUNDWATER ELEVATION BEHIND THE SLURRY WALL, DURING CONSTRUCTION AND DURING OPERATION. INSTALL AT APPROXIMATELY 100-FT SPACING. THE LOCATIONS SHOWN ON THE DRAWING ARE CONCEPTUAL.



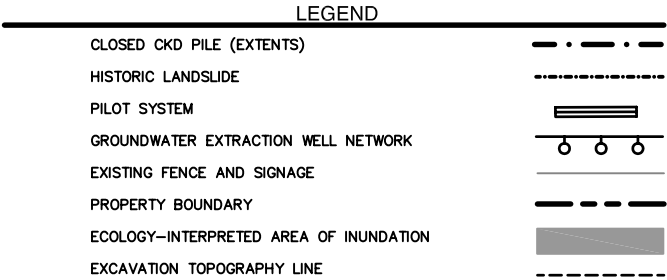
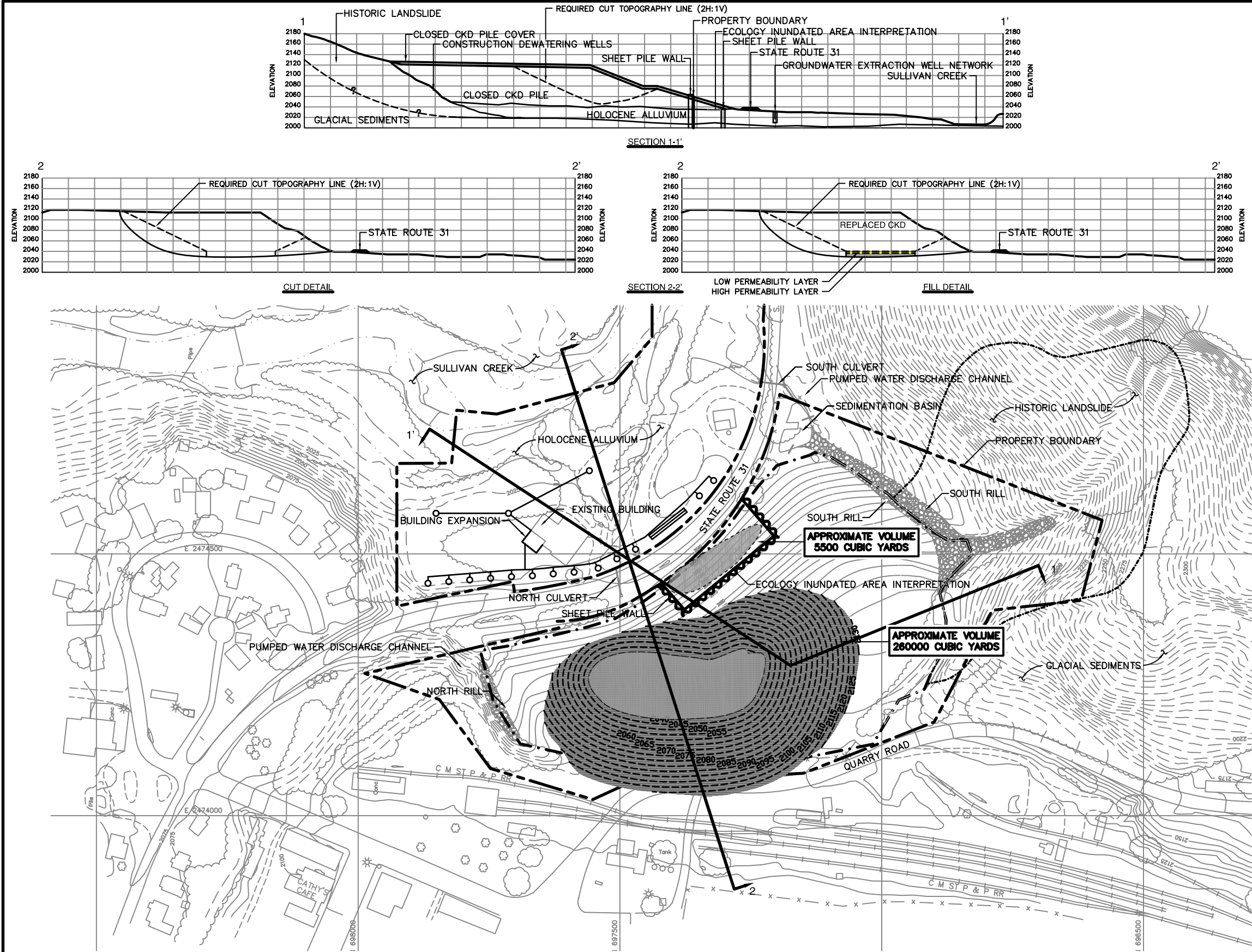
NOTE: THE ALTERNATIVE LAYOUT SHOWN ON THIS EXHIBIT IS INTENDED ONLY FOR THE PURPOSE OF ILLUSTRATION AND ONLY TO SUPPORT THE FEASIBILITY STUDY COMPARISON OF ALTERNATIVES. ACCORDINGLY, THE LOCATION, LAYOUT AND DETAILS OF ALTERNATIVE COMPONENTS AS SHOWN HERE WILL VARY.



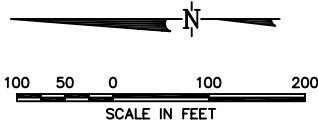
			
		<b>GEOSYNTEC CONSULTANTS</b> 2100 MAIN STREET, SUITE 150 HUNTINGTON BEACH, CALIFORNIA 92648 TELEPHONE: (714) 969-0800	
PROJECT: LEHIGH CEMENT COMPANY – CLOSED CKD PILE SITE METALINE FALLS, WASHINGTON DRAFT CLEANUP ACTION PLAN			
TITLE: ALTERNATIVE #3 ADDITIONAL SOURCE CONTROL			
DATE: DECEMBER 2005	CHECKED BY: JAC	SCALE: AS SHOWN	FIGURE NO:  <b>5</b>
DESIGN BY: EDS	REVIEWED BY: TRS (PROJ. MGR.)	JOB NO.: HR0196-12	
DRAWN BY: SLB	DOCUMENT NO:	FILE NO: 0196F163	

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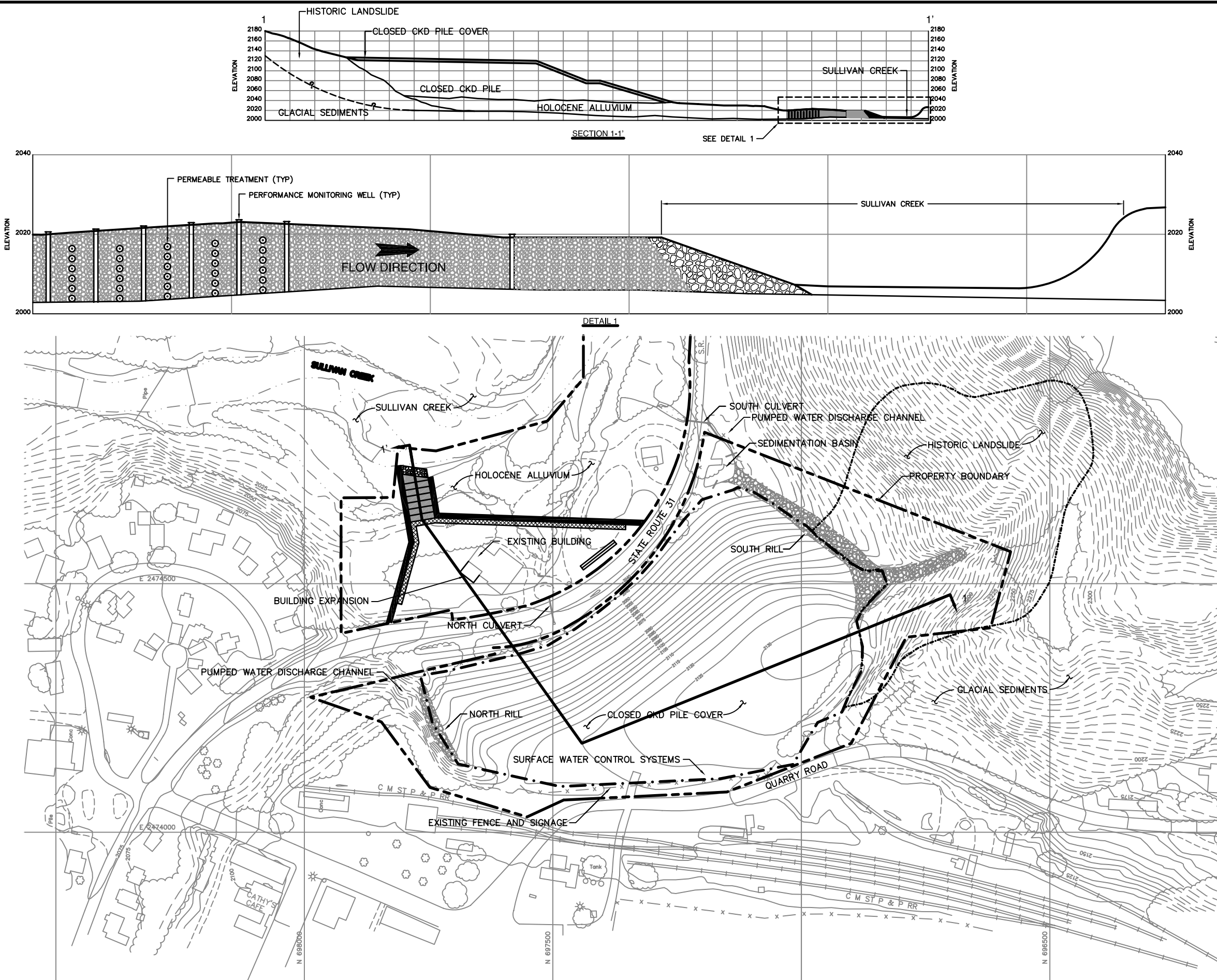
NOTE: THE ALTERNATIVE LAYOUT SHOWN ON THIS EXHIBIT IS INTENDED ONLY FOR THE PURPOSE OF ILLUSTRATION AND ONLY TO SUPPORT THE FEASIBILITY STUDY COMPARISON OF ALTERNATIVES. ACCORDINGLY, THE LOCATION, LAYOUT AND DETAILS OF ALTERNATIVE COMPONENTS AS SHOWN HERE WILL VARY.



<b>LEHIGH</b> HEIDELBERGCEMENT Group		<b>GEOSYNTEC CONSULTANTS</b> 2100 MAIN STREET, SUITE 150 HUNTINGTON BEACH, CALIFORNIA 92648 TELEPHONE: (714) 969-0800			
PROJECT: LEHIGH CEMENT COMPANY – CLOSED CKD PILE SITE METALINE FALLS, WASHINGTON DRAFT CLEANUP ACTION PLAN					
TITLE: <b>ALTERNATIVE #4</b> <b>PARTIAL SOURCE REMOVAL</b>					
DATE: DECEMBER 2005	CHECKED BY: JAC	SCALE: AS SHOWN	FIGURE NO:		
DESIGN BY: EDS	REVIEWED BY: TRS	JOB NO.: HR0196-12	6		
DRAWN BY: SLB	DOCUMENT NO:	FILE NO: 0196F164			

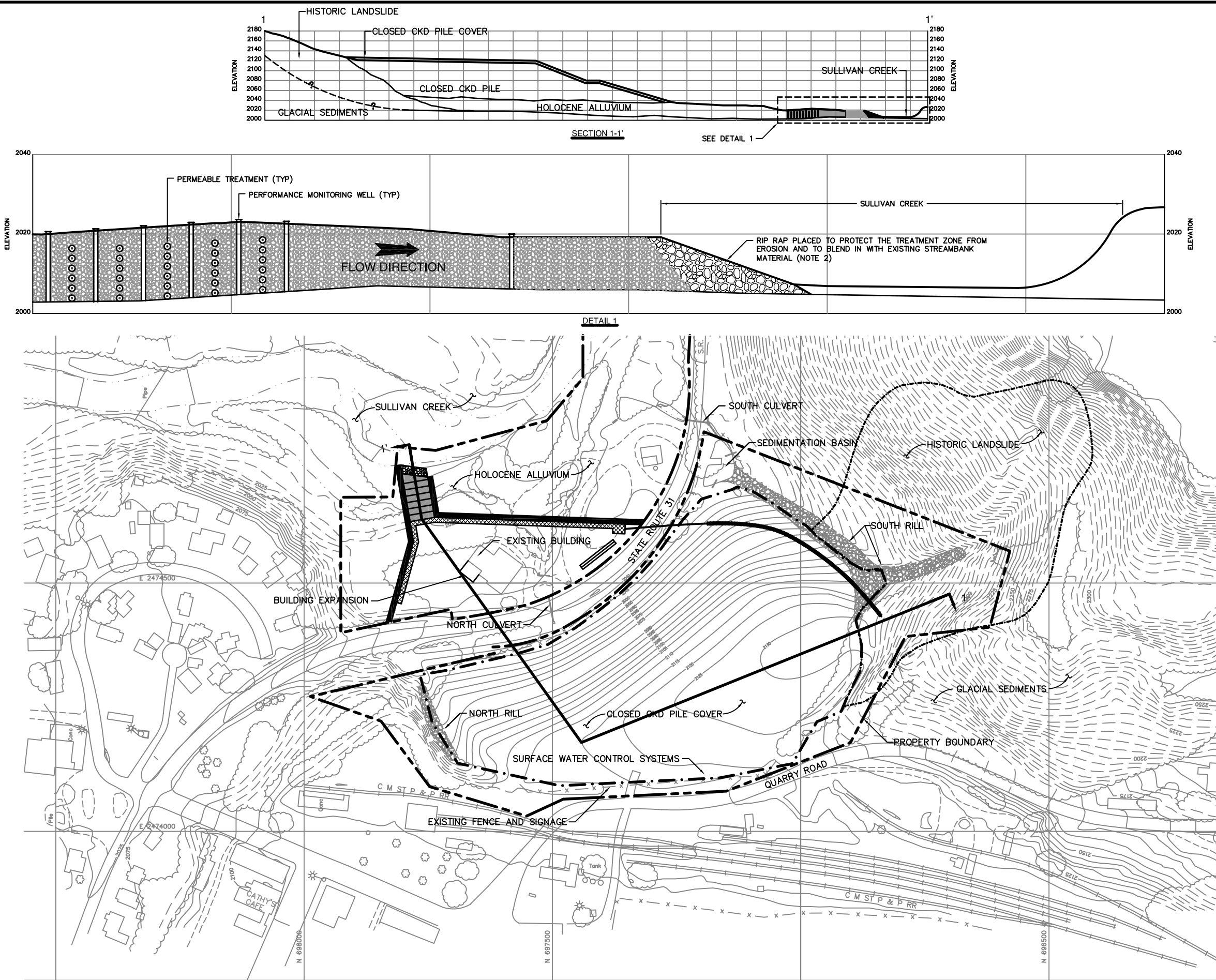
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<b>LEHIGH</b> HEIDELBERGCEMENT Group		<b>GEO SYNTEC CONSULTANTS</b> 2100 MAIN STREET, SUITE 150 HUNTINGTON BEACH, CALIFORNIA 92648 TELEPHONE: (714) 969-0800			
PROJECT: LEHIGH CEMENT COMPANY - CLOSED CKD PILE SITE METALINE FALLS, WASHINGTON DRAFT CLEANUP ACTION PLAN					
TITLE: <b>ALTERNATIVE #6</b> <b>CLEANUP ACTION PRELIMINARY LAYOUT</b>					
DATE: DECEMBER 2005	CHECKED BY: EDS	SCALE: AS SHOWN	FIGURE NO:		
DESIGN BY: BLP	REVIEWED BY: EDS (PROJ. MGR.)	JOB NO.: HR0196-12	8		
DRAWN BY: SLB	DOCUMENT NO: DCAP	FILE NO: 0196F160			

**EXHIBIT C**  
**Consent Decree**  
**Lehigh Cement Company Closed CKD Pile Site**  
**Scope of Work and Schedule**

This Scope of Work implements the Cleanup Action Plan (Exhibit B) to address groundwater contamination at the Lehigh Cement Company Closed CKD Pile Site (Site) (Exhibit A) in Metaline Falls, Washington. This Scope of Work was prepared by the Department of Ecology (Ecology), and is to be used by the potentially liable person (PLP), Lehigh Cement Company (Lehigh), to develop plans and designs in order to implement the cleanup action selected for the Site.

Lehigh shall furnish all personnel, materials, and services necessary for, or incidental to, performing the cleanup action selected for the Site.

The Scope of Work contains the following tasks, to be accomplished in accordance with the schedule below:

Task 1: Engineering Design Report

The Engineering Design Report will comply with the requirements of WAC 173-340-400(4)(a). The Engineering Design Report will provide engineering concepts and design criteria for both major components of the selected cleanup action, the funnel and gate system and the gravity drain. The funnel and gate design and configuration will be one aspect of the design. The Engineering Design Report will describe the location of the funnel component of the cleanup action, as well as the materials and methods used for the funnel construction. The gate design will describe the gate and the treatment technology utilized to adjust the pH and remove arsenic, chromium, lead, and manganese. The Engineering Design Report will also include appurtenances such as the carbon dioxide tank, compressor, gauges, piping, and other information necessary to prepare bid specifications documents.

The second component of the cleanup action addressed in the Engineering Design Report is the gravity drain. The Engineering Design Report will include the gravity drain location, as well as the materials and methods used for drain construction. The Engineering Design Report will also include methods to evaluate the source control provided by the gravity drain. The Engineering Design Report should be adequate to obtain the necessary permits or meet the substantive provisions of laws for which there is a permit exemption in MTCA for the Site remediation.

To document the operation of the Cleanup Action, as well as effects that the Cleanup Action has on the local groundwater, Lehigh will collect data in accordance with the Compliance Monitoring Plan (CMP) (see Task 3). Such data will be collected using:

- a. procedures to monitor the flow captured by the gravity drain;
- b. groundwater wells in the area between State Route 31 and the funnel portion of the Cleanup Action. These wells will document the groundwater level between the funnel component and the Closed CKD Pile.

Exhibit C – Scope of Work  
Lehigh Cement Company  
Closed CKD Pile Site

- c. monitoring locations in the small untreated area between the funnel portion of the Cleanup Action and Sullivan Creek. These locations will be used to document progress of the natural cleanup of the groundwater in this area.

The CMP will describe specifics for these three data collection efforts above, as well as the other data needed for the cleanup action.

The Engineering Design Report will include a section describing the institutional controls for the Site. Institutional controls will be required for portions of Parcels 269543, 258000, 261251, 220677, and 269543, which contain the groundwater contamination plume. Lehigh owns the Parcels that overlay the groundwater contamination plume, and therefore, institutional controls are not necessary for adjacent landowners or third parties. The controls will prohibit groundwater usage except for purposes related to the cleanup action, such as groundwater monitoring.

The restrictive covenant to restrict the groundwater usage is Exhibit F of the Consent Decree. The institutional control section of the Engineering Design Report will provide the location of physical barriers and signs to prevent exposure to contamination.

Following completion of the Engineering Design Report, the Construction Plans and Specifications will be completed, submitted to Ecology for review and approval, and made available for the purpose of bidding on the project construction. The Construction Plans and Specifications will comply with WAC 173-340-400(4)(b). The bid process should be completed in order to meet the construction start date.

#### Task 2: Permits and Substantive Conditions of Permit-Exempt Laws

Lehigh must obtain several permits prior to construction of the remedial systems for the cleanup action, or identify substantive requirements of laws for which MTCA creates a permit exemption. The permits will include National Pollution Discharge Elimination System (NPDES), Section 401 Water Quality Certification, U.S. Army Corps of Engineers Section 404 Dredge and Fill and Section 10 Rivers and Harbors Act permits. In addition, Ecology will identify the substantive provisions of the Shoreline Management Act, Floodplain Management Act, and Hydraulics Project Approval that Lehigh must meet in implementing the cleanup action. Public review and comment on each of the above permits and substantive conditions will be provided after entry of the Consent Decree.

#### Task 3: Compliance Monitoring Plan

The Compliance Monitoring Plan will be developed prior to installation of the remediation systems. The Compliance Monitoring Plan will include protection monitoring, performance monitoring, and confirmational monitoring plans. The Compliance Monitoring Plan will also include a Sampling and Analysis Plan (SAP) and a Quality Assurance Project Plan (QAPP). Each plan will meet the requirements of WAC 173-340-410. All sampling data shall be submitted to Ecology according to the requirements of Section X of the Consent Decree.

#### Task 4: Operations and Maintenance Plan

An Operations and Maintenance (O&M) Plan will be developed in accordance with WAC 173-340-400(4)(c) for all approved remediation systems other than the cover and stormwater system for the Closed CKD Pile. An approved Post-Closure Care and Maintenance Plan for the cover and stormwater systems is presented as Exhibit G of the Consent Decree. The O&M Plan will include the monitoring and replacement schedules for the major remediation system components. The O&M Plan shall identify the person(s) responsible for each task outlined in the O&M Plan and relevant contact information. The O&M Plan will be completed prior to installation of the remediation systems. The O&M Plan shall describe and provide for continued implementation of the institutional controls for the Site as developed in the Engineering Design Report.

#### Task 5: Cleanup Action Implementation

The Engineering Design Report will be used to develop bid specifications to be used in obtaining bids for cleanup action implementation. Based on the Engineering Design Report and the project bids, Lehigh will prepare a punch list of items to be completed during cleanup action implementation. The punch list items will be tracked as the implementation progresses.

The Feasibility Study Technical Report (FSTR) contains a conceptual design for the cleanup action. The conceptual design includes a preliminary estimated description and alignment for the major cleanup action components, the funnel and gate and the gravity drain. Cleanup action details may be modified during the final design phase, pending Ecology's review and approval of the Engineering Design Report. Thus, the following description of cleanup action implementation is preliminary.

The first major component of the cleanup action will be the installation of the funnel and gate system. The funnel will consist of a subsurface hydraulic barrier constructed of a low-permeability material such as a bentonite slurry or high density polyethylene (HDPE) that will extend vertically from the surface to key into the underlying low-permeability soils. The funnel will be located on Lehigh property that is east of State Route 31. Based on the conceptual design submitted in the FSTR, the southern leg of the funnel will be located just west of monitoring well MW-8. The northern leg of the funnel will be located south of PM-15 and PM-19 and north of PM-18. Groundwater treatment will occur in the gate where silicone tubing will be installed to diffuse carbon dioxide into the groundwater.

The second major component of the cleanup action will be the installation of the gravity drain. The gravity drain will be placed utilizing directional drilling techniques and located along the southern edge of the Closed CKD Pile. The drain will be placed to intercept groundwater and route the water to discharge near the southern leg of the funnel. Intercepted water may be unaffected by CKD or it may require treatment. Consideration will therefore be given to the ability to route the captured groundwater into the treatment system, if necessary, or to discharge it to subsurface structures. Water flow within the gravity drain will be measured to evaluate the source control provided.



As noted in Task 1, the CMP will contain details on monitoring wells and data collection to document operation of the gravity drain, the progress towards natural cleanup in the untreated area, and the groundwater surface in the area between the Closed CKD Pile and the funnel component. Lehigh may use existing wells, install new wells or use a combination in the CMP. Monitoring of these wells will commence prior to installation of the gravity drain.

As implementation progresses Lehigh will review the punch list and address remaining punch list items to complete construction according to the project schedule below. As described in the Consent Decree, Lehigh will seek written approval for any significant deviations from Ecology.

#### Task 6: Institutional Controls

After Lehigh completes construction of the cleanup action, it will implement the institutional controls described in the approved Engineering Design Report and approved Operations and Maintenance Plan.

#### Task 7: Cleanup Action Report

Lehigh will submit a Cleanup Action Report in accordance with WAC 173-340-400 (6)(b) 120 days after completion of the construction of the cleanup as defined by “construction complete” as set forth in schedule below. Laboratory data shall be included in the report and will be completely reviewed according to the quality assurance and quality control procedures outlined in the SAP and QAPP. Raw data shall be submitted to Ecology following receipt of the data from the analytical laboratory. The Cleanup Action Report will be submitted with boring logs and other graphical representations of the work performed. The report will also provide documented evidence that institutional controls have been implemented.

### **SCHEDULE**

Each of the documents required below are subject to Ecology’s review and approval. Ecology will approve, approve with conditions, or disapprove of such documents. If Ecology disapproves a document, Ecology will provide comments to Lehigh and the parties will establish a mutually agreed upon date for Lehigh’s re-submittal of the document, not to exceed forty-five (45) days after Lehigh’s receipt of Ecology’s comments. Lehigh will then submit a revised document that addresses Ecology’s comments.

<u>Deliverables</u>	<u>Date Due</u>
Effective date of Consent Decree	Start
Lehigh submits Draft Engineering Design Report	60 days after start
Lehigh submits Final Engineering Design Report	30 days after Lehigh receives Ecology’s written comments on Draft Engineering Design Report
Exhibit C – Scope of Work	
Lehigh Cement Company	
Closed CKD Pile Site	

Ecology approves the Final Engineering Design Report	30 days after receipt
Lehigh submits Construction Plans and Specifications	30 days after Ecology approval of Engineering Design Report
Lehigh submits Operations and Maintenance Plan and Compliance Monitoring Plans	30 days after submittal of Plans and Specifications
Begin constructing cleanup action	120 days after Ecology approves Final Engineering Design Report
Construction is complete	180 days after construction begins
Lehigh implements institutional controls	90 days after construction is complete
Lehigh submits Draft Cleanup Action Report	120 days after construction is complete
Lehigh submits Progress Reports	In accordance with Section XI of Decree.

**EXHIBIT D**

**PUBLIC PARTICIPATION PLAN**

**LEHIGH CEMENT COMPANY**  
**Closed Cement Kiln Dust (CKD) Pile Site**

**PREPARED BY:**

**LEHIGH CEMENT COMPANY**  
**AND**  
**WASHINGTON STATE**  
**DEPARTMENT OF ECOLOGY**

**JANUARY 2006**

# **PUBLIC PARTICIPATION PLAN**

## **INTRODUCTION**

### **OVERVIEW OF PUBLIC PARTICIPATION PLAN**

This Public Participation Plan (Plan) has been developed by Lehigh Cement Company (Lehigh) and the Washington Department of Ecology (Ecology) for the cleanup action to be implemented under the proposed Consent Decree for the Lehigh Cement Company Closed Cement Kiln Dust (CKD) Pile Site (Site). The Site is located near Metaline Falls at approximately milepost 14.7 along State Route 31 in Pend Oreille County, Washington (see Appendix A for Site Map). The Plan is part of a legal agreement called a Consent Decree. The Consent Decree is between Lehigh and Ecology and is filed in Superior Court. The purpose of the Consent Decree is to describe the responsibilities of all parties in implementing the cleanup action plan. The Consent Decree also assures work is conducted in a timely manner in accordance with the Model Toxics Control Act (MTCA) and all other applicable laws and regulations. The cleanup action focuses on certain metals and high pH in groundwater (see Site Background for details). The metals include arsenic, chromium, lead and manganese. Concentrations of pH, arsenic, lead, chromium, and manganese in the groundwater exceed MTCA cleanup levels.

The Hazardous Waste and Toxic Cleanup Program at Ecology originally provided oversight for the closure of the Lehigh CKD landfill. The Toxics Cleanup Program has formally provided administration and oversight since April 2002 for the investigation and evaluation of groundwater cleanup alternatives at the Site. The Plan complies with MTCA regulations (Chapter 173-340-600 WAC) and outlines public outreach efforts from 2002 until completion of the cleanup action for the Site. Ecology maintains responsibility for the public participation at the Site, and Lehigh will help coordinate and implement any future outreach. Ecology will determine final approval of the Plan as well as any amendments.

The purpose of the Plan is to help the public understand Ecology's responsibilities, planning, and cleanup activities at this Site. It also serves as a way to gather information from the public that will help Ecology and Lehigh plan for Site-related cleanup in a manner that is protective of human health and the environment. This Plan will help the communities of Metaline Falls and Metaline to be informed about the groundwater cleanup action at the Site and how interested persons may contribute to the decision-making process.

A glossary of terms used in this Plan is included as Appendix C. Documents relating to the cleanup action may be reviewed at the repositories listed on page 8 of this Plan. If individuals are interested in knowing more about the Site or have comments regarding the Plan, please contact one of the individuals listed below:

Mr. Bill Fees, Environmental Engineer Washington State Department of Ecology Eastern Regional Office 4601 North Monroe Spokane, WA 99205 509-329-3589 Email: <a href="mailto:wfee461@ecy.wa.gov">wfee461@ecy.wa.gov</a>	Ms. Elizabeth Mikols, Manager Environmental Affairs Lehigh Cement Company 7660 Imperial Way Allentown, PA 18195 610-366-4753
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<p>Mrs. Johnnie Landis, Public Disclosure Washington State Department of Ecology Eastern Regional Office 4601 North Monroe Spokane, WA 99205 509-329-3415 Email: <a href="mailto:johh461@ecy.wa.gov">johh461@ecy.wa.gov</a></p> <p>Ms. Carol Bergin, Public Involvement Washington State Department of Ecology Eastern Regional Office 4601 North Monroe Spokane, WA 99205 509-329-3546 Email: <a href="mailto:cabe461@ecy.wa.gov">cabe461@ecy.wa.gov</a></p>	<p>Mr. Eric Smalstig, Project Manager GeoSyntec Consultants 2100 Main Street, Suite 150 Huntington Beach, CA 92648 714-969-0800 Extension 208</p>
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### **PUBLIC PARTICIPATION AND THE MODEL TOXICS CONTROL ACT (MTCA)**

MTCA is a citizens' initiative which passed in the November 1988 general election. It provides guidelines for the cleanup of contaminated sites in Washington State. This law sets strict standards to make sure the cleanup of sites is protective of human health and the environment. Ecology's Toxics Cleanup Program investigates reports of contamination that may threaten human health and/or the environment. If an investigation confirms the presence of contaminants, a site is ranked and placed on a Hazardous Sites List. Current or former owners or operators as well as any other potentially liable persons (PLPs) of a site may be held responsible for cleanup of contamination according to the standards set under MTCA. The PLPs are notified by Ecology that a site has contaminants, and the process of cleanup begins with Ecology implementing and overseeing the project. The PLP for this Site is the Lehigh Cement Company.

Public participation is an important part of the MTCA process. The public participation needs are assessed at each site according to interest expressed by the public and degree of risk posed by contaminants. Individuals who live near a site, community groups, businesses, organizations and other interested parties are provided an opportunity to become involved in commenting on the cleanup process. A Public Participation Plan includes requirements for public notice such as: identifying reports about a site and the repositories where reports may be read; providing public comment periods; and holding public meetings or hearings. Additional forms of participation may be personal interviews, involvement in citizen advisory groups, questionnaires, or workshops. Citizen groups living near contaminated sites may apply for public participation grants to receive technical assistance in understanding the cleanup process and to create additional public participation avenues.

### **SITE BACKGROUND**

#### **SITE DESCRIPTION AND HISTORY**

Lehigh owned and operated a cement plant from 1914 until 1989. Raw materials were mined from a quarry south of the facility and brought to the processing plant. Limestone and clay materials were prepared, heated and ground to make the cement. In the heating process, cement kiln dust (CKD) was generated as a waste by-product. The CKD was disposed of in the landfill on-site.

When CKD and groundwater interact the groundwater alkalinity (pH) increases. The high pH is caused by the high amount of lime in the CKD. The pH of groundwater is determined to be acidic or alkaline based upon a range of numbers from 0 to 14. Numbers from 0-7 are acidic, a pH of 7 is neutral and from 7-14 are alkaline. Pure water is represented by the number 7. Groundwater sampled beneath and downgradient of the CKD landfill contained elevated pH levels, up to 13.9. As the alkaline groundwater passed through native geologic materials, it dissolved naturally-occurring metals. The high pH and metals in Site groundwater exceeds state groundwater cleanup standards.

The contaminated groundwater discharges along the west bank of Sullivan Creek and is seen as amber-colored water during times of low water flow. Steps have been taken since 1996 to address potential exposure pathways. The contaminated water is not currently used for domestic use (e.g., drinking water).

In 1996, Lehigh closed the CKD landfill and constructed a cover over the landfill to minimize contact with storm water. A storm water management system also was constructed to control storm water run-on and run-off. The system included catch basins, internal and external drain pipes, and a sediment basin. After the CKD landfill was closed, it was called the Lehigh Cement Kiln Dust (CKD) Pile.

### **Six Alternatives Evaluated to Clean Up Groundwater**

Several investigations have been conducted at the Site since 1992 to determine the nature and extent of contamination. The Feasibility Study Technical Report considers the information gathered from these investigations and identifies and evaluates options for cleanup.

Six alternatives were selected for in depth evaluation. Each alternative includes constructing necessary support facilities in or around the existing building between State Route 31 and Sullivan Creek and applying institutional controls. Institutional controls include warning signs, fencing and restrictive covenants. Each alternative allows for ongoing compliance monitoring. The cleanup alternatives evaluated are as follows:

**Alternative 1 - Permeable Treatment Wall.** This option extends an existing subsurface pilot system treatment zone along the east side of State Route 31. CKD-affected groundwater will pass through the treatment zone before moving to Sullivan Creek. In addition to the passive treatment wall, a number of wells will be placed downgradient of the treatment zone to extract untreated groundwater that may migrate through gaps in the treatment zone. The extracted water is then routed back to the treatment zone.

**Alternative 2 - Groundwater Control.** This option continues operation of the existing pilot system treatment and adds extraction wells to collect CKD-affected groundwater. The groundwater is extracted and treated above ground, lowering the pH and precipitating metals. Treated groundwater is then discharged to Sullivan Creek under the requirements of a National Pollution Discharge Elimination System (NPDES) permit.

**Alternative 3 - Additional Source Control.** This option includes a vertical barrier upgradient of the Closed CKD Pile. The barrier directs water away from the CKD. Wells on the up gradient side of the barrier capture and re-route water around the Closed CKD Pile.

This reduces the amount of water contacting the CKD. This option also includes downgradient groundwater extraction and above ground treatment components similar to Alternative No. 2.

**Alternative 4 - Partial Source Removal.** This option involves removing approximately 265,500 cubic yards of CKD in order to extract the lower portions of the Closed CKD Pile that are in contact with the groundwater. This alternative also involves removing and re-installing a large part of the engineered CKD cover in order to remove the CKD. This option also includes downgradient groundwater extraction wells and above ground treatment components similar to Alternative No. 2.

**Alternative 5 - Funnel and Gate Treatment.** This option involves installing a system of shallow underground vertical barrier walls and gravel drainage layers between State Route 31 and Sullivan Creek to intercept groundwater and route it to a subsurface treatment zone. The intercepted groundwater is treated in situ (in place) with the technology used in the pilot system in Alternative 1. Treated water then discharges to Sullivan Creek via a subsurface corridor.

**Alternative 6 - Partial Additional Source Control.** This option uses source control coupled with the downgradient in situ treatment as described in Alternative 5. This alternative supplements Alternative 5 with a source control gravity drain under the southern edge of the Closed CKD Pile. The drain captures and re-directs groundwater away from the Closed CKD Pile. CKD-affected groundwater is funneled to the treatment zone. Alternative 6 is the preferred alternative selected by Ecology and is similar to the alternative recommended by Lehigh.

Evaluation of each of these six alternatives takes into consideration protecting human health and the environment, complying with cleanup standards, complying with applicable state and federal laws and providing for compliance monitoring. The evaluation also includes using permanent solutions to the maximum extent practicable, providing for a reasonable restoration time frame and considering public concerns.

#### **Draft Cleanup Action Plan (DCAP)**

A DCAP is based on information obtained from the Remedial Investigation and Feasibility Study reports. The DCAP evaluates proposed cleanup options outlined in the Feasibility Study and selects proposed cleanup actions. Ecology selected Alternative 6 that was presented in the Feasibility Study. The DCAP requires the following actions to be implemented at the Site:

- Installing, operating, and maintaining an in-situ (in place) groundwater treatment system east of the Closed CKD Pile between State Route 31 and Sullivan Creek. The treatment system will consist of a subsurface hydraulic barrier that intercepts contaminated groundwater and directs it toward a treatment corridor. The purpose of the treatment corridor is to lower the pH of the groundwater before it is discharged to Sullivan Creek. The lowered pH will also result in metals being removed from the groundwater. The treated water will be discharged under a National Pollutant Discharge Elimination System (NPDES) permit.

- Installing, operating, and maintaining a gravity drain along the southern edge of the Closed CKD Pile. The drain will intercept groundwater and re-direct it away from the pile. The intercepted water will be routed to an area at the eastern side of the barrier. Water intercepted by the drain will meet cleanup levels prior to discharge.
- Monitoring to assess performance of the treatment system. Details of the monitoring program, including parameters and frequency, will be specified in the Compliance Monitoring Plan.
- Applying and maintaining institutional controls. Institutional controls are measures to limit or prohibit activities at the Site that could interfere with maintaining the cleanup once it is completed. Fences, signs, and a restrictive covenant on the property are required. A restrictive covenant limits how a property may be used (see Exhibit F of the Consent Decree).

### **Consent Decree**

The Consent Decree is a legal agreement between Ecology and Lehigh that is filed in Superior Court and describes the responsibilities of all parties in implementing the cleanup action plan. This Plan is part of the requirements for the Consent Decree. The Consent Decree assures that work is conducted in a timely manner in accordance with the MTCA and all other applicable laws and regulations. The Consent Decree, which implements the groundwater cleanup action for the Site, does not relieve Lehigh of its ongoing responsibility to provide for operation and maintenance of the cover and stormwater system for the Closed CKD Pile (see Exhibit G of the Consent Decree).

### **National Pollutant Discharge Elimination System (NPDES) Permit**

Discharges to Sullivan Creek that occur as part of the groundwater treatment system will meet requirements of the National Pollutant Discharge Elimination System (NPDES) permit. The NPDES permit will be available for public comment along with the Engineering Design Report during 2006.

## **COMMUNITY BACKGROUND**

### **COMMUNITY PROFILE**

The property where the cleanup action will be implemented is owned by Lehigh and is near the town of Metaline Falls. Southwest of Metaline Falls on the west side of the river is another town called Metaline. The population of Metaline Falls and Metaline combined is approximately 400. Art and culture is particularly important to Metaline Falls which was voted one of the “100 Best Small Art Towns in America” in 1996. Metaline Falls includes a number of historical buildings including the Cutter Theatre which features live performances, an art gallery, the Historic Schools Display and houses the Metaline Falls Library.

Local industries include mining, timber, agriculture and recreation. Mining has taken place in the area since the late 1800s. Timber has been harvested for many years in the area on both private and public lands for lumber and other forest products. However, this industry has declined within the past few years.

The community is surrounded by popular recreation spots. Attractions include Sullivan Lake, Gardner Caves, Boundary and Box Canyon Dams, the Pend Oreille River, the North Pend Oreille Scenic



Byway and International Selkirk Loop. Activities include hiking, cross-county skiing, camping, rock climbing, boating, hunting, fishing, wildlife and scenery viewing. Metaline Falls is home to a nine-hole golf course and a Gun Club which includes skeet shooting, gun sighting and target practice facilities.

### **COMMUNITY CONCERNS**

Ecology and Lehigh have made several efforts to engage local citizens in the cleanup process. However, citizens have expressed limited interest in the cleanup process and associated comment periods. In 1995 a public hearing was held to take comments about the closure of the CKD landfill. Seventeen people attended, but no attendees gave any formal public testimony. Most of the people attending were Lehigh employees and consultants. Most of the public feedback received by Ecology during this time period focused on the Pend Oreille Mine and potential job openings.

Additional public comment periods related to the Closed CKD Pile were held in November 1998, November 1999 and May 2005. In the May 2005 comment period only one comment was received from the Pend Oreille County P.U.D. The commenter wanted Ecology to be aware of a water line in the vicinity of the Site. Continued efforts will be made to inform and engage the public in the cleanup action for the Site.

### **SITE CLEANUP PROCESS**

#### **Agreed Order**

In 1999 a legal agreement between Ecology and Lehigh was reached. The agreement called an Agreed Order required a Remedial Investigation and Feasibility Study (RI/FS) to be conducted to determine the nature and extent of groundwater contamination downgradient of the Closed CKD Pile.

#### **Remedial Investigation/Feasibility Study (RI/FS)**

The purpose of the RI/FS was to collect, develop and evaluate information regarding CKD-related contamination in groundwater downgradient of the Closed CKD Pile. The RI defines the type, extent and degree of soil, groundwater and surface water contamination and the impacts to the affected areas. The FS identifies, evaluates and proposes alternative cleanup actions.

#### **Draft Cleanup Action Plan (DCAP)**

The DCAP is based on information obtained from the RI/FS reports. The DCAP evaluates proposed cleanup options outlined in the FS and selects proposed cleanup actions.

#### **State Environmental Policy Act (SEPA)**

SEPA requires government agencies to consider the potential environmental impacts of a project before beginning actual cleanup. After review of a completed environmental checklist and other site-specific information, Ecology may determine the cleanup will not have a probable adverse impact on the environment. Additionally, if it is determined the cleanup action will benefit the environment by reducing the release of toxic chemicals from the Site, a determination of non-significance may be issued by Ecology.

### **Consent Decree**

The Consent Decree is a legal agreement between Ecology and Lehigh that describes the responsibilities of all parties in implementing the cleanup action approved by Ecology. The Consent Decree assures that work is conducted in a timely manner in accordance with MTCA and all other applicable laws and regulations.

### **PUBLIC PARTICIPATION ACTIVITIES AND TIMELINE**

The following are public participation efforts which will occur until the cleanup actions are completed:

- ❖ A **mailing list** has been developed for persons who reside within the potentially affected vicinity of the proposed cleanup action. It also includes businesses, organizations and individuals who have expressed interest in the cleanup process for the Site.
- ❖ Persons on the mailing list will receive copies of fact sheets developed regarding the cleanup process via first class mail. Additionally, individuals, organizations, local, state and federal governments, and any other interested parties will be added to the mailing list upon request. Other interested persons may request to be added to the mailing list by contacting Carol Bergin at the Department of Ecology (see Page 3 of this Plan for Carol Bergin's contact information).
- ❖ **Public Repositories** have been established and documents may be reviewed at the following offices:

Washington State Department of Ecology  
Eastern Regional Office  
4601 North Monroe  
Spokane, WA 99205  
Contact: Mrs. Johnnie Landis 509-329-3415  
**Hours:** Monday – Thursday 8:00 am – 5:00 pm

Metline Falls Public Library  
Cutter Theatre Building  
302 Park Street  
Metline Falls, WA 99153  
509-446-3232  
**Hours:** Monday 10:00 am-noon and 1:00 pm – 6:00 pm  
Wednesday 1:00 pm – 6:00 pm  
Friday 10:00 am-4:00 pm  
2<sup>nd</sup> and 4<sup>th</sup> Saturdays every month 10:00 am – 3:00 pm

- ❖ During each stage of the cleanup process, **fact sheets** are created by Ecology, reviewed by Lehigh and distributed to individuals on the mailing list. These fact sheets explain the current status of the cleanup process, give a brief background and ask for comments from the public. A **30-day comment period** allows interested parties time to comment at specific stages during the cleanup process. The information from these fact sheets is also published in a **Site Register** which is distributed to the public. Persons interested in receiving the Site Register should contact Linda Thompson of Ecology at 360-407-6069 or e-mail [ltho461@ecy.wa.gov](mailto:ltho461@ecy.wa.gov).

- ❖ **Display ads or legal notices** are published in the Statesman Examiner, Selkirk Sun, Newport Miner and The Spokesman-Review to inform the general public. These notices correlate with the 30-day comment period and associated stage of the cleanup process. They are also used to announce public meetings, workshops or hearings.
- ❖ **Public meetings, workshops, open houses and public hearings** are held based upon the level of community interest. If ten or more persons request a public meeting or hearing based on the subject of the public notice, Ecology will hold a meeting or hearing and gather comments. It is anticipated that public meetings, open houses and/or hearings will be held at the Cutter Theatre in Metaline Falls. The date, time and locations of hearings, meetings, workshops, or open houses will be announced in fact sheets, display ads or legal notices in accordance with MTCA.
- ❖ Written comments which are received during the 30-day comment periods may be responded to in a **Responsiveness Summary**. The Responsiveness Summary may be sent to those who make the written comments and will be available for public review at the Repositories listed on page 8 of this Plan.

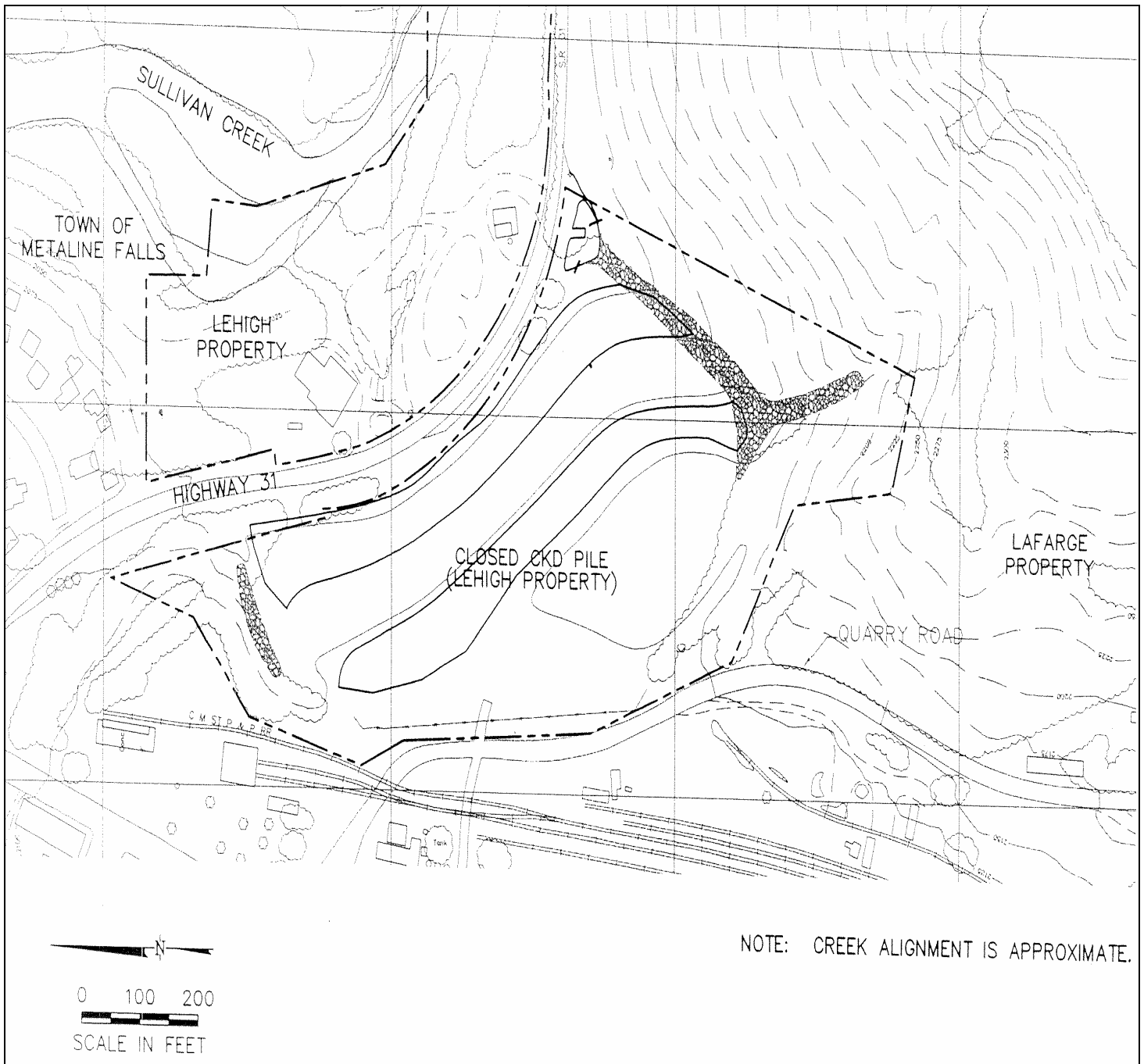
#### **ANSWERING QUESTIONS FROM THE PUBLIC**

Individuals in the community may have questions they want to ask so they may better understand the cleanup process. The list of contacts for the Site is provided on pages 2 and 3 of this Plan. Interested persons are encouraged to contact these persons by phone or e-mail to obtain information about the Site, the cleanup process and potential decisions.

#### **Public Participation**

<b>Document or Activity</b>	<b>Date</b>
Public Notice	September 1, 1995 30-day Public Notice of Ecology's intent to approve Lehigh's closure plan
Public Hearing in Metaline Falls re: intent to approve closure plan	September 20, 1995
Emergency Enforcement Order	November 1998
Fact Sheet re: Emergency Enforcement Order	30-day public comment period: November 13, 1998 through December 14, 1998
Agreed Order	October 11, 1999
Fact Sheet re: Agreed Order	30-day public comment period: November 23 through December 23, 1999
Revised Draft Feasibility Study Technical Report – Lehigh Cement Company Closed Cement Kiln Dust Pile	March 2005
Fact Sheet re: Revised Draft Feasibility Study Technical Report – Lehigh Cement Company Closed Cement Kiln Dust Pile	30-day public comment period: May 25 through June 23, 2005
Draft Cleanup Action Plan, Consent Decree and SEPA DNS	30-day public comment period: Time in 2005 To be Determined

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## **APPENDIX C**

### **GLOSSARY**

**Agreed Order:** A legal document issued by Ecology which formalizes an agreement between the department and potentially liable persons (PLPs) for the actions needed at a site. An agreed order is subject to public comment. If an order is substantially changed, an additional comment period is provided.

**Applicable State and Federal Law:** All legally applicable requirements and those requirements that Ecology determines are relevant and appropriate requirements.

**Area Background:** The concentrations of hazardous substances that are consistently present in the environment in the vicinity of a site which are the result of human activities unrelated to releases from that site.

**Carcinogen:** Any substance or agent that produces or tends to produce cancer in humans.

**Chronic Toxicity:** The ability of a hazardous substance to cause injury or death to an organism resulting from repeated or constant exposure to the hazardous substance over an extended period of time.

**Cleanup:** The implementation of a cleanup action or interim action.

**Cleanup Action:** Any remedial action, except interim actions, taken at a site to eliminate, render less toxic, stabilize, contain, immobilize, isolate, treat, destroy, or remove a hazardous substance that complies with cleanup levels; utilizes permanent solutions to the maximum extent practicable; and includes adequate monitoring to ensure the effectiveness of the cleanup action.

**Cleanup Action Plan:** A document which identifies the cleanup action and specifies cleanup standards and other requirements for a particular site. After completion of a comment period on a Draft Cleanup Action Plan, Ecology will issue a final Cleanup Action Plan.

**Cleanup Level:** 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 Process:** The process for identifying, investigating, and cleaning up hazardous waste sites.

**Consent Decree:** A legal document, approved and issued by a court which formalizes an agreement reached between the state and potentially liable persons (PLPs) on the actions needed at a site. A decree is subject to public comment. If a decree is substantially changed, an additional comment period is provided.

**Containment:** A container, vessel, barrier, or structure, whether natural or constructed, which confines a hazardous substance within a defined boundary and prevents or minimizes its release into the environment.

**Contaminant:** Any hazardous substance that does not occur naturally or occurs at greater than natural background levels.

**Enforcement Order:** A legal document, issued by Ecology, requiring remedial action. Failure to comply with an enforcement order may result in substantial liability for costs and penalties. An enforcement order is subject to public comment. If an enforcement order is substantially changed, an additional comment period is provided.

**Environment:** Any plant, animal, natural resource, surface water (including underlying sediments), ground water, drinking water supply, land surface (including tidelands and shorelands) or subsurface strata, or ambient air within the state of Washington.

**Exposure:** Subjection of an organism to the action, influence or effect of a hazardous substance (chemical agent) or physical agent.

**Exposure Pathways:** The path a hazardous substance takes or could take from a source to an exposed organism. An exposure pathway describes the mechanism by which an individual or population is exposed or has the potential to be exposed to hazardous substances at or originating from the site. Each exposure pathway includes an actual or potential source or release from a source, an exposure point, and an exposure route. If the source exposure point differs from the source of the hazardous substance, exposure pathway also includes a transport/exposure medium.

**Facility:** Any building, structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or publicly-owned treatment works), well, pit, pond, lagoon, impoundment, ditch, landfill, storage container, motor vehicle, rolling stock, vessel, or aircraft; or any site or area where a hazardous substance, other than a consumer product in consumer use, has been deposited, stored, disposed or, placed, or otherwise come to be located.

**Feasibility Study(FS):** A study to evaluate alternative cleanup actions for a site. A comment period on the draft report is required. Ecology selects the preferred alternative after reviewing those documents.

**Groundwater:** Water found beneath the earth's surface that fills pores between materials such as sand, soil, or gravel. In aquifers, groundwater occurs in sufficient quantities that it can be used for drinking water, irrigation, and other purposes.

**Hazardous Sites List:** A list of sites identified by Ecology that requires further remedial action. The sites are ranked from 1 to 5 to indicate their relative priority for further action.

**Hazardous Substance:** Any dangerous or extremely hazardous waste as defined in RCW 70.105.010 (5) (any discarded, useless, unwanted, or abandoned substances including, but not limited to, certain pesticides, or any residues or containers of such substances which are disposed of in such quantity or concentration as to pose a substantial present or potential hazard to human health, wildlife, or the environment because such wastes or constituents or combinations of such wastes; (a) have short-lived, toxic properties that may cause death, injury, or illness or have mutagenic, teratogenic, or carcinogenic properties; or (b) are corrosive, explosive, flammable, or may

generate pressure through decomposition or other means,) and (6) (any dangerous waste which (a) will persist in a hazardous form for several years or more at a disposal site and which in its persistent form presents a significant environmental hazard and may affect the genetic makeup of man or wildlife; and is highly toxic to man or wildlife; (b) if disposed of at a disposal site in such quantities as would present an extreme hazard to man or the environment), or any dangerous or extremely dangerous waste as designated by rule under Chapter 70.105 RCW: any hazardous substance as defined in RCW 70.105.010 (14) (any liquid, solid, gas, or sludge, including any material, substance, product, commodity, or waste, regardless of quantity, that exhibits any of the characteristics or criteria of hazardous waste as described in rules adopted under this chapter,) or any hazardous substance as defined by rule under Chapter 70.105 RCW; petroleum products.

**Hazardous Waste Site:** Any facility where there has been a confirmation of a release or threatened release of a hazardous substance that requires remedial action.

**Independent Cleanup Action:** Any remedial action conducted without Ecology oversight or approval, and not under an order or decree.

**Initial Investigation:** An investigation to determine that a release or threatened release may have occurred that warrants further action.

**Interim Action:** Any remedial action that partially addresses the cleanup of a site.

**Mixed Funding:** Any funding, either in the form of a loan or a contribution, provided to potentially liable persons from the state toxics control account.

**Model Toxics Control Act (MTCA):** Washington State's law that governs the investigation, evaluation and cleanup of hazardous waste sites. Refers to RCW 70.105D. It was approved by voters at the November 1988 general election and known is as Initiative 97. The implementing regulation is WAC 173-340.

**Monitoring Wells:** Special wells drilled at specific locations on or off a hazardous waste site where groundwater can be sampled at selected depths and studied to determine the direction of groundwater flow and the types and amounts of contaminants present.

**Natural Background:** The concentration of hazardous substance consistently present in the environment which has not been influenced by localized human activities.

**National Priorities List (NPL):** EPA's list of hazardous waste sites identified for possible long-term remedial response with funding from the federal Superfund trust fund.

**Owner or Operator:** Any person with any ownership interest in the facility or who exercises any control over the facility; or in the case of an abandoned facility, any person who had owned or operated or exercised control over the facility any time before its abandonment.

**Potentially Liable Person (PLP):** Any person whom Ecology finds, based on credible evidence, to be liable under authority of RCW 70.105D.040.

**Public Notice:** At a minimum, adequate notice mailed to all persons who have made a timely request of Ecology and to persons residing in the potentially affected vicinity of the proposed action; mailed to appropriate news media; published in the local (city or county) newspaper of largest circulation; and opportunity for interested persons to comment.

**Public Participation Plan:** A plan prepared under the authority of WAC 173-340-600 to encourage coordinated and effective public involvement tailored to the public's needs at a particular site.

**Release:** Any intentional or unintentional entry of any hazardous substance into the environment, including, but not limited to, the abandonment or disposal of containers of hazardous substances.

**Remedial Action:** Any action to identify, eliminate, or minimize any threat posed by hazardous substances to human health or the environment, including any investigative and monitoring activities of any release or threatened release of a hazardous substance and any health assessments or health effects studies.

**Remedial Investigation:** A study to define the extent of problems at a site. When combined with a study to evaluate alternative cleanup actions it is referred to as a Remedial Investigation/Feasibility Study (RI/FS). In both cases, a comment period on the draft report is required.

**Responsiveness Summary:** A compilation of all questions and comments to a document open for public comment and their respective answers/replies by Ecology. The Responsiveness Summary is mailed, at a minimum, to those who provided comments and its availability is published in the Site Register.

**Risk Assessment:** The determination of the probability that a hazardous substance, when released into the environment, will cause an adverse effect in exposed humans or other living organisms.

**Sensitive Environment:** An area of particular environmental value, where a release could pose a greater threat than in other areas including: wetlands; critical habitat for endangered or threatened species; national or state wildlife refuge; critical habitat, breeding or feeding area for fish or shellfish; wild or scenic river; rookery; riparian area; big game winter range.

**Site:** See Facility.

**Site Characterization Report:** A written report describing the site and nature of a release from an underground storage tank, as described in WAC 173-340-450 (4) (b).

**Site Hazard Assessment (SHA):** An assessment to gather information about a site to confirm whether a release has occurred and to enable Ecology to evaluate the relative potential hazard posed by the release. If further action is needed, an RI/FS is undertaken.

**Site Register:** Publication issued every two weeks of major activities conducted statewide related to the study and cleanup of hazardous waste sites under the Model Toxics Control Act. To receive this publication, please call (360) 407-7200.

**Surface Water:** Lakes, rivers, ponds, streams, inland waters, salt waters, and all other surface waters and water courses within the state of Washington or under the jurisdiction of the state of Washington.

**TCP:** Toxics Cleanup Program at Ecology

**Toxicity:** The degree to which a substance at a particular concentration is capable of causing harm to living organisms, including people, plants and animals.

**Washington Ranking Method (WARM):** Method used to rank sites placed on the hazardous sites list. A report describing this method is available from Ecology.

**EXHIBIT E**

**GROUND WATER SAMPLING DATA SUBMITTAL REQUIREMENTS**

**LEHIGH CEMENT COMPANY  
CLOSED CEMENT KILN DUST (CKD) PILE SITE  
METALINE FALLS, WASHINGTON**

**Contents**

**Washington Department of Ecology  
Toxic Cleanup Program Policy 840  
Effective Date: August 1, 2005**

**and**

**Washington Department of Ecology  
Environmental Information Management (EIM) Submittal Guidelines,  
Version 2004.08, August 2004**



# Toxics Cleanup Program Policy

## Policy 840

*Resource Contact:* Policy and Technical Support Staff *Effective:* August 1, 2005

*References:* WAC 173-340-840(5)

*Revised:* New

<http://www.ecy.wa.gov/eim/>

<http://www.ecy.wa.gov/programs/tcp/smu/sedqualfirst.htm>

<http://www.ecy.wa.gov/biblio/0309043.html>

*Replaces:* Procedure 840

## Policy 840: Data Submittal Requirements

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***Purpose:*** Contaminated site investigations and cleanups generate a large volume of environmental monitoring data that need to be properly managed to facilitate regulatory decisions and access to this data by site owners, consultants, and the general public. The purpose of this policy is to describe the requirements for submitting environmental monitoring data generated/collected during the investigation and cleanup of contaminated sites under the Model Toxics Control Act (MTCA) and the Sediment Management Standards.

***Application:*** This policy applies to Ecology staff, potentially liable parties, prospective purchasers, state and local agencies, and Ecology contractors that investigate or manage the cleanup of contaminated sites.

- 1. Unless Otherwise Specified by Ecology, all Environmental Monitoring Data Generated during Contaminated Site Investigations and Cleanups shall be Required to be Submitted to Ecology in both a Written and Electronic Format.**
- 

Environmental monitoring data include biological, chemical, physical, and radiological data generated during site investigations and cleanups under the Model Toxics Control Act Cleanup Regulation (WAC 173-340) and the Sediment Management Standards (WAC 173-204).

Data generated/collected during site investigations and cleanups conducted under an order, agreed order or consent decree, permit, grant, loan, contract, interagency agreement, memorandum of understanding or during an independent remedial action, are considered environmental monitoring data under this policy.

Data generated/collected for non site-specific studies, site hazard assessments that result in no further action and initial site investigations are not considered environmental monitoring data under this policy.

- 2. Orders, Agreed Orders, Consent Decrees, or Permits Issued After the Effective Date of this Policy Shall Include a Condition that Site-Specific Data be Submitted in Compliance with this Policy.**
- 

Reports on such work that do not include documentation that the data have been submitted in compliance with this policy shall be deemed incomplete and a notice of such provided to the



## Policy 840 Data Submittal Requirements

submitter. These reports generally should not be reviewed until that information is provided. The assistant attorney general assigned to the site should be consulted in these situations.

Example language to include in these documents is attached in Appendices A, B, and C.

### **3. Reports on Independent Remedial Actions Submitted for Review After October 1, 2005, Under Ecology's Voluntary Cleanup Program Shall Not be Reviewed Until the Data Have Been Submitted in Compliance with this Policy.**

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Such reports shall be deemed incomplete, and a notice to this effect provided to the submitter.

### **4. Grants, Contracts, Interagency Agreements or Memoranda of Understanding Issued After the Effective Date of this Policy Shall Include a Condition that Site-Specific Data be Submitted in Compliance with this Policy.**

---

Reports on such work shall not be accepted as complete until the data have been submitted in compliance with this policy. If a payment or transfer of funds is involved in the transaction, the relevant payment or transfer shall be withheld until this requirement has been met.

Example language to include in these documents is attached in Appendix D.

### **5. Data Generated During Upland Investigations and Cleanups Shall be Submitted Electronically Using Ecology's Environmental Information Management System (EIM).**

---

EIM is Ecology's main database for environmental monitoring data. Proper submission of data through this system meets the requirement of submitting such data in an electronic format. Electronic data shall be submitted to Ecology simultaneously with the accompanying printed report.

Additional information on EIM, including instructions for data submittal, can be found on Ecology's EIM web site at <http://www.ecy.wa.gov/eim/>. ICP's EIM Coordinator also is available for technical assistance to site managers and consultants using EIM.

### **6. Data Submitted Electronically Using EIM Shall be Checked by the Toxics Cleanup Program's EIM Coordinator Prior to Loading the Data into EIM.**

---

Normally, notice that data have been submitted through EIM will come to ICP's EIM Coordinator. Upon receipt of such a notice the EIM Coordinator should notify the site manager. Similarly, if the Ecology site manager receives a notice of an EIM submittal, they should notify TCP's EIM Coordinator. Upon receipt of the data, TCP's EIM Coordinator reviews the submittal for quality control and officially loads the data into the system.

### **7. Data Generated During Sediment Investigations and Cleanups shall be Submitted Electronically Using Ecology's Sediment Quality Information System (SEDQUAL).**

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SEDQUAL is Ecology's data management system for sediment-related data. Proper submission of data through this system meets the requirement of submitting such data in an electronic format. Electronic data shall be submitted to Ecology simultaneously with the accompanying printed report.

## **8. Sediment Sampling Data Shall be Submitted to Ecology Using the SEDQUAL Data Entry Templates.**

---

At a minimum, the following SEDQUAL data entry templates must be completed:

1. **Reference & Bibliography:** Describes lab reports and publications that relate to the data being entered;
2. **Survey:** Sample number;
3. **Station:** Specifies geographic location of the sediment sample. Sample latitude/longitude coordinates must be entered using the North American Datum of 1983 in U.S. Survey feet (NAD 83, U.S. feet);
4. **Sample:** Describes sample characteristics such as depth; and
5. **Sediment Chemistry:** Reports chemical concentration data in dry weight units.

The following additional templates must also be completed where these measurements/observations have been made:

1. **Bioassay:** Bioassay test results;
2. **Bioassay Control:** Bioassay control test results;
3. **Benthic Infauna:** Species abundance & diversity;
4. **Tissue:** Describes the organism collected;
5. **Bioaccumulation:** Reports tissue chemical concentrations; and
6. **Histopathology:** Reports tissue pathology such as tumors or lesions.

## **9. Electronic Data Formats Shall be Verified to be Compatible with SEDQUAL Prior to Submittal.**

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Because SEDQUAL uses ASCII protocol and comma delimited text files, data format verification shall be conducted prior to submittal to Ecology. Data shall be verified by downloading the SEDQUAL database, importing the data into the database, correcting errors, and then exporting the corrected templates.

For additional information on sediment sampling and analysis plan requirements, see Ecology publication 03-09-043 "Sediment Sampling and Analysis Plan Appendix", April, 2003. A copy of this document can be obtained from Ecology's publication office or downloaded from the following web site: <http://www.ecy.wa.gov/biblio/0309043.html>

Additional information on SEDQUAL can be found at:

<http://www.ecy.wa.gov/programs/tcp/smu/sedqualfirst.htm>. TCP's SEDQUAL Coordinator is also available for technical assistance to site managers and consultants using SEDQUAL.

## **10. Sediment Sampling Data Shall Also be Submitted to Ecology in a Printed Report.**

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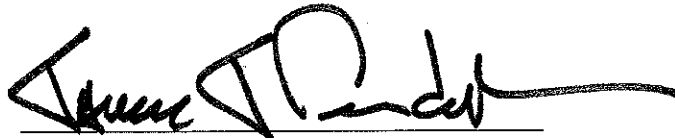
Printed reports shall present the data in both dry weight and total organic carbon normalized units in data tables that compare the results to applicable state regulatory criteria

**11. Data Submitted Electronically Using SEDQUAL Shall be Checked by the Toxics Cleanup Program's SEDQUAL Coordinator Prior to Loading the Data into SEDQUAL.**

---

Normally, SEDQUAL data submittals will come to TCP's SEDQUAL Coordinator. Upon receipt of a submittal, the Coordinator should notify the site manager. Similarly, if the Ecology site manager receives a SEDQUAL submittal, they should notify TCP's SEDQUAL Coordinator. Upon receipt of the data, TCP's SEDQUAL Coordinator reviews the submittal for quality control and officially loads the data into the system.

Approved:



James J. Pendowski, Program Manager  
Toxics Cleanup Program

**Policy Disclaimer:** This policy is intended solely for the guidance of Ecology staff. It is not intended, and cannot be relied on, to create rights, substantive or procedural, enforceable by any party in litigation with the state of Washington. Ecology may act at variance with this policy depending on site-specific circumstances, or modify or withdraw this policy at any time.

**EXHIBIT F**

**LEHIGH CEMENT COMPANY  
CLOSED CKD PILE SITE  
METALINE FALLS, WASHINGTON**

**RESTRICTIVE COVENANT**

## DECLARATION OF COVENANT

The undersigned, Lehigh Cement Company, a Pennsylvania corporation (hereafter "Lehigh Cement Company"), is the fee owner of real property (hereafter the "Property") in the County of Pend Oreille, State of Washington, that is subject to this Declaration of Covenant (hereafter the "Covenant"). The Property consists of \_\_\_\_\_ separate parcels, each of which is legally described in Attachment A of this Covenant and incorporated herein by reference.

### Recitals

This Covenant is made by Lehigh Cement Company pursuant to RCW 70.105D.030(1)(f) and (g) and WAC 173-340-440. A remedial action (hereafter "Remedial Action") is being conducted at the Property that is the subject of this Covenant. The Remedial Action conducted at the Property is described in the following documents:

1. Cleanup Action Plan for the Closed Cement Kiln Dust Pile, Metaline Falls, Washington dated \_\_\_\_\_.
2. Design documents dated \_\_\_\_\_.

These documents are currently on file at the Washington State Department of Ecology's (hereafter "Ecology") Eastern Regional Office, located at N. 4601 Monroe, Spokane, Washington. The Remedial Action includes installation of a groundwater remediation system on the Property. The groundwater remediation system includes a drain pipe that extends from Parcel \_\_\_\_\_ to Parcel \_\_\_\_\_; a funnel-and-gate treatment system that has been installed on Parcel(s) \_\_\_\_\_; and monitoring wells installed on Parcels \_\_\_\_\_. These components of the groundwater remediation system are depicted on the as-built drawings in Attachment B of this Covenant, which is incorporated herein by reference.

This Covenant is required because a conditional point of compliance has been established for groundwater. Arsenic, lead, chromium, manganese, and high pH are present in groundwater upgradient of the conditional point of compliance in concentrations that exceed the Model Toxics Control Act Method B cleanup levels established under WAC 173-340-720. Groundwater captured by the groundwater remediation system is treated through an in situ treatment system, with the treated effluent discharged to surface water (Sullivan Creek) through an engineered subsurface outfall.

Lehigh Cement Company makes the following declaration as to limitations, restrictions, and uses to which each of the parcels on the Property may be put and specifies that such declarations shall constitute covenants to run with the land, as provided by law and shall be binding on the legal representatives, successors and assigns of all persons having or in

the future acquiring any right, title, or interest in any of the parcels on the Property (hereafter "Owner").

## **Covenant**

**Limitations, Restrictions, and Uses for Parcel \_\_\_\_\_:** *[The following lists all of the restrictions that could apply to various parcels. After the groundwater treatment system is installed, Ecology and Lehigh will determine which restrictions apply to which parcels.]*

Section 1. No groundwater may be taken from the parcel, except for purposes related to the Remedial Action, such as groundwater monitoring.

Section 2. The Owner shall maintain components of the groundwater remediation system installed on this parcel in accordance with the Maintenance Requirements of the Operations and Maintenance Plan, Attachment C of this Covenant, which is incorporated herein by reference as now written and hereafter amended.

Section 3. The Owner shall maintain a suitable barrier that restricts unauthorized access to the groundwater remediation system, as described in the Operations and Maintenance Plan, Attachment C of this Covenant, which is incorporated herein by reference as now written and hereafter amended.

Section 4. The Owner shall maintain one or more signs warning that groundwater beneath this parcel contains elevated levels of arsenic, lead, chromium, manganese, and pH, as described in the Operations and Maintenance Plan, Attachment C of this Covenant, which is incorporated herein by reference as now written and hereafter amended.

Section 5. The Owner is prohibited from blocking access by authorized personnel to any component of the groundwater remediation system installed on this parcel. This includes, but is not limited to, placing structures above any component of the groundwater remediation system (except structures needed to operate, maintain, or repair the system).

Section 6. Any activity on the parcel that may result in the release or exposure to the environment of a hazardous substance that remains on the parcel as part of the Remedial Action, or create a new exposure pathway, is prohibited without prior written approval from Ecology. Such activities include, but are not limited to, the following when conducted within twenty-five (25) feet of any component of the groundwater remediation system: drilling or digging; placing any objects or using any equipment that deforms or stresses the ground surface beyond its load-bearing capability; or bulldozing or earthwork.

Section 7. Any activity on the parcel that may interfere with the integrity of the Remedial Action and the resultant continued protection of human health and the

environment is prohibited.

**Section 8.** The Owner must give thirty (30) days advance written notice to Ecology of the Owner's intent to convey any interest in the parcel. No conveyance of title, easement, lease, or other interest in the parcel shall be consummated by the Owner without adequate and complete provision for continued monitoring, operation, and maintenance, if any, as required by the Remedial Action. The Owner must include in any instrument conveying any interest in the parcel notice of this Restrictive Covenant.

**Section 9.** The Owner must restrict leases to uses and activities consistent with the Restrictive Covenant and notify all lessees of the restrictions on the use of the parcel.

**Section 10.** The Owner must notify and obtain approval from Ecology prior to any use of the parcel that is inconsistent with the terms of this Restrictive Covenant. Ecology may approve any inconsistent use only after public notice and comment.

**Section 11.** The Owner shall allow authorized representatives of Ecology the right to enter the parcel at reasonable times for the purpose of evaluating the Remedial Action, to take samples, to inspect the Remedial Action conducted at the parcel, and to inspect records that are related to the Remedial Action. Except in an emergency, Ecology shall notify the Owner of its intention to enter the parcel at least 48 hours before entry.

**Section 12.** The Owner of the parcel reserves the right under WAC 173-340-440 to record an instrument that provides that this Restrictive Covenant shall no longer limit use of the parcel or be of any further force or effect. However, such an instrument may be recorded only if Ecology, after public notice and opportunity for comment, concurs.

**Limitations, Restrictions, and Uses for Parcel \_\_\_\_\_:** *[Each parcel subject to the Restrictive Covenant will have its own "Limitations, Restrictions, and Uses" section that incorporates restrictions from the list above that are appropriate to that parcel]*

### **Miscellaneous Provisions**

**Governing Law.** The validity, performance, and enforceability of this Covenant shall be governed by the laws of the State of Washington.

**Notices.** All notices or other communications that are required or permitted to be given under this Covenant shall be in writing, and either personally delivered or mailed to the following addresses:

Notices or other communications to Ecology:

Washington State Department of Ecology  
Eastern Regional Office  
Toxics Cleanup Program  
N. 4601 Monroe

Spokane, WA 99205

Notices or other communications to Lehigh Cement Company:

Lehigh Cement Company  
7660 Imperial Way  
Allentown, PA 18195

(Signature block appears on next page)



**LEHIGH CEMENT COMPANY, a Pennsylvania corporation**

By \_\_\_\_\_  
Its \_\_\_\_\_

COMMONWEALTH OF PENNSYLVANIA  
COUNTY OF LEHIGH

On this \_\_\_\_ day of \_\_\_\_\_, 200\_\_, before me, the undersigned, a Notary Public in and for the Commonwealth of Pennsylvania, duly commissioned and sworn, personally appeared \_\_\_\_\_, to me known to be the person who signed as \_\_\_\_\_ of LEHIGH CEMENT COMPANY, the corporation that executed the within and foregoing instrument, and acknowledged 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 he was duly elected, qualified and action as said officer of the corporation, that he was authorized to execute said instrument and that the seal affixed, if any, is the corporate seal of said corporation.

IN WITNESS WHEREOF I have hereunto set my hand and official seal the day and year first above written.

\_\_\_\_\_  
Print Name: \_\_\_\_\_

Notary Public in and for the Commonwealth of Pennsylvania

Residing at \_\_\_\_\_

My commission expires: \_\_\_\_\_

**Attachment A**  
**Legal Description**  
**(To be provided in Engineering Design Documents)**

**Attachment B**  
**As-built Drawings**  
**(To be provided in Engineering Design Documents)**

**Attachment C**  
**Operations and Maintenance Plan**  
**(To be provided in Engineering Design Documents)**

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*FILE COPY*

# Post-Closure Care and Maintenance Plan

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For the Closure of the Cement Kiln Dust Pile  
Metaline Falls, Washington

Prepared for:  
Lehigh Portland Cement Company

July 20, 1995

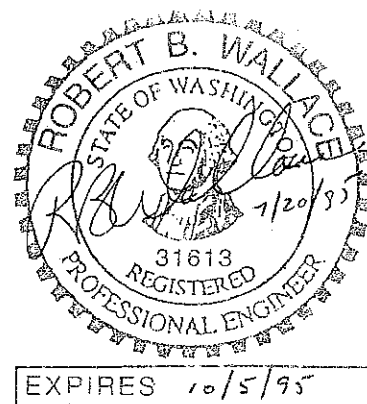


DAMES & MOORE, INC.

Job No. 00691-006-005

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**POST-CLOSURE CARE AND MAINTENANCE PLAN  
FOR THE CLOSURE OF THE  
CEMENT KILN DUST PILE  
METALINE FALLS, WASHINGTON**

**LEHIGH PORTLAND CEMENT COMPANY**

**1.0 INTRODUCTION**

This Post-closure Care and Maintenance Plan (the Plan) has been prepared by the Seattle, Washington office of Dames & Moore, Inc. (Dames & Moore), on behalf of the Lehigh Portland Cement Company (Lehigh) for the closure of a cement kiln dust (CKD) waste pile located in Metaline Falls, Washington.

This Plan addresses those measures that shall be followed in the maintenance and care of the pile after closure. Monitoring requirements are outlined, including the parties associated with that work and the relevant contacts of these parties. Lehigh shall continue to monitor and maintain the integrity and effectiveness of the closure capping system and associated appurtenances for thirty (30) years from the date of closing, unless these requirements are changed at some time by the State of Washington Department of Ecology (Ecology).

**2.0 OWNER OF THE CKD PILE**

The CKD pile was produced as a waste product from a dry processing kiln of a Portland cement production plant owned and operated by Lehigh from 1952 to 1989. It consists of approximately 544,000 tons of CKD, which designates as a Washington State-only dangerous waste by the characteristic of corrosivity (WAC 173-303-090(6)) and the criteria for toxicity (WAC 173-303-100(5)). The CKD pile is an interim status dangerous waste treatment, storage, and disposal (TSD) unit.

After completion of the closure of the CKD pile, Lehigh shall remain the designated owner of the site. The relevant contact address is:

Lehigh Portland Cement Company  
7660 Imperial Way  
Allentown, Pennsylvania 18195

Attention:                    Mr. Thomas E. Kessler  
                                  (610) 366-4663 direct phone  
                                  (610) 366-4606 fax

Any questions which may arise regarding the CKD pile or the reporting of any site problems should be directed to the designated Lehigh representative, or alternatively, to the Engineer of Record, indicated in Section 3.0 of this Plan.

### 3.0 CLOSURE CAPPING SYSTEM

#### 3.1 CAPPING SYSTEM CONFIGURATION

A closure capping system was designed and constructed to serve as a final containment cover for the CKD pile. The closure cap consists of the following layers, from top to bottom:

- Cement Kiln Dust, is the waste material contained in the pile which requires confinement due to its chemical characteristics. It effectively comprises the bottom layer of the cap cross section and, in fact, because of its relatively low hydraulic conductivity (approximately  $5 \times 10^{-6}$  cm/sec), serves as a low permeability soil layer and as a bottom component of a GCL/CKD composite liner.
- Geosynthetic Clay Liner (GCL), comprises the barrier layer (located directly above and in intimate contact with the CKD), which has been designed as a stand-alone liner, although as noted above, the CKD has sufficiently low hydraulic conductivity (permeability) that the two layers combined will act as a composite liner. GCLs consist of bentonite soils sandwiched between two geotextiles, which are needlepunched or stitched to form a stable network.
- Drainage Geotextile, used as a combined protective cushion layer and transmissive drainage layer, located directly above and in contact with the GCL.
- Reinforcement Geotextile, a reinforcing geosynthetic used to protect the GCL and prevent sliding of the cover soils down steep slopes. The Reinforcement Geotextile will be incorporated within the cover layer on the slopes only, to prevent the transfer of downdrag loads from the cover soil to the barrier layer.
- Cover Soil, consisting of locally excavated soils, placed and compacted above the geotextile, to provide protective cover and insulation, and to inhibit infiltration of precipitation to the capping system.
- Topsoil, placed immediately above the cover soil, designed to provide vegetative support, critical for long term stability of the capping system, in particular on steep slope sections.

This capping system was installed in accordance with the detailed plans and specifications prepared by the Engineer of Record, on behalf of Lehigh.



### 3.2 ENGINEER OF RECORD

The Engineer of Record, responsible for the design and construction of the closure capping system of the CKD pile, is as follows:

Dames & Moore, Inc.  
2025 First Avenue, Suite 500  
Seattle, Washington 98121

Attention: Mr. Robert B. Wallace, P.E.  
(206) 728-0744 phone  
(206) 727-3350 fax

Dames & Moore was responsible for the preparation of the closure capping system design, as well as the oversight on the construction of the pile. Any questions or issues which may arise with regard to the design or implementation during construction should be addressed by Dames & Moore, through Lehigh.

### 4.0 POST-CLOSURE CARE AND MAINTENANCE REQUIREMENTS

#### 4.1 SPECIFIC REGULATORY REQUIREMENTS

The post-closure requirements for the CKD pile conform to the requirements prescribed by the Washington Department of Ecology Dangerous Waste Regulations (Chapter 173-303 WAC), specifically, WAC 173-303-610, Subsections 7 through 11; and WAC 173-303-665, pertaining to post-closure care and use of the property.

In particular, the following requirements shall be met, throughout the period from completion of closure, continuing until the end of the post-closure care period:

- "ground water monitoring and reporting as applicable" (WAC 173-303-610(7)(a)(i)) - monitoring of groundwater shall be carried out every three months, with annual reporting to Ecology; and
- "maintenance and monitoring of waste containment systems as applicable" (WAC 173-303-610(7)(a)(ii)) - an inspection of the site shall be carried out quarterly, at the time of the groundwater monitoring, and any deficiencies or problems shall be investigated and remedied as required.

## 4.2 REGULATORY AGENCY

The closure of the CKD pile has been overseen by the Spokane Regional office of the State of Washington Department of Ecology. The relevant contact is:

Department of Ecology  
Eastern Regional Office  
4601 N. Monroe, Suite 202  
Spokane, WA 99205-1295

Attention: Mr. Keith L. Stoffel, Hydrogeologist  
(509) 456-3176 phone

## 4.3 DURATION OF CARE AND MAINTENANCE

The primary purpose of the post-closure care and maintenance period is to protect human health and the environment. The standard duration of the post-closure care and maintenance of the facility is 30 years after completion of the closure. The prescribed 30-year period may be modified by Ecology, in accordance with WAC 173-303-610(7)(b)(i) if "it finds that the reduced period is sufficient to protect human health and the environment (e.g., leachate or ground water monitoring results, characteristics of the dangerous waste, application of advanced technology, or alternative disposal, treatment, or reuse techniques indicate that the dangerous waste management unit or facility is secure)". At this site, such a provision would likely be triggered by the results of the groundwater monitoring, upon completion of testing determining "clean" levels of contaminants.

## 4.4 FUTURE LAND USE

The post-closure land use of the CKD pile has not been specified. In view of the present needs of the local community, it has been assumed that the site will not have any planned land use throughout the care and maintenance period. Should any planned use arise during the post-closure period, Lehigh shall ensure that the proposed land use does not disturb the integrity of the cap or the functioning of the monitoring systems. Any future land use at the site shall require the permission and approval of Lehigh and ensure that the use does not present any threat to human health and the environment. Any unplanned (unauthorized) use of the property will be discouraged. Nevertheless, the closure of the CKD pile has incorporated provisions to protect the integrity of the final cover and other components of the containment system, in addition to the monitoring systems present on site, in conformance with WAC 173-303-610(7)(d).

#### **4.5 POST-CLOSURE PLAN**

WAC 173-303-610(8) requires a Post-closure Care and Maintenance Plan. This document (the Plan) meets the requirements of this section. This section of the regulation also contains a provision for modification of the Plan by Lehigh, subject to review and approval by Ecology, during the post-closure period.

#### **4.6 NOTICES TO LOCAL LAND AUTHORITY**

##### **4.6.1 Notice to Local Land Authority**

Upon completion of the certification of closure of the CKD pile, Lehigh submitted to local land use authority, with a copy to Ecology, a survey plat showing the location and dimensions of the closed facility, with respect to permanently surveyed benchmarks, prepared and certified by a registered land surveyor in the State of Washington, in conformance with WAC 173-303-610(9). The relevant contact address is:

Land Use Authority  
c/o Lafarge Corporation  
P.O. Box 157  
Metaline Falls, WA 99153

Attention: Mr. Carl McKenzie  
(509) 446-3101 phone  
(509) 446-4712 fax

This survey plat has been appended to this Post-closure Care and Maintenance Plan, within Appendix A.

##### **4.6.2 Notice in Deed to Property**

In addition to the survey plat, a similar survey plan has been submitted, indicating to the best of Lehigh's knowledge and available records, the location of the CKD waste within the pile, in accordance with WAC 173-303-610(10). This plan is also contained within Appendix A.

#### **4.7 CERTIFICATION OF COMPLETION OF POST-CLOSURE CARE**

Upon completion of the 30-year post-closure care and maintenance period (or revised duration if authorized by Ecology per WAC 173-303-610(7)(b)(i)), Lehigh shall submit to Ecology, within 60 days, a certification by a (third party) professional engineer registered in the State of Washington, that the post-closure care and maintenance was performed throughout the required period, in conformance with this Plan, as approved by Ecology (WAC 173-303-610(11)). Upon satisfaction of this submittal with appropriate documentation, Ecology shall release Lehigh from the financial assurance requirements for post-closure care as contained in WAC 173-303-620(6).

## 5.0 GROUNDWATER MONITORING

### 5.1 DESIGNATED MONITORING CONSULTANT

A program of groundwater monitoring has been established with monitoring being completed on a quarterly basis. The responsible consultant for the groundwater monitoring, being performed on behalf of Lehigh, is:

Dames & Moore, Inc.  
2025 First Avenue, Suite 500  
Seattle, Washington 98121

Attention: Ms Melody Allen  
(206) 728-0744 phone  
(206) 727-3350 fax

Dames & Moore shall provide on-site monitoring in accordance with the requirements presented in Section 4.2 of this Plan. In addition to the monitoring activities, visual inspections of the condition of the closed facility will be performed at the same time as field monitoring.

### 5.2 GROUNDWATER MONITORING

Groundwater monitoring has been carried out on a continuing basis throughout the investigation of the CKD pile, and throughout the design and implementation of the closure plan. This monitoring shall continue throughout the post-closure period, on a quarterly basis, with the results of the monitoring program being reported to the Spokane, Washington office of Ecology on an annual basis. Monitoring shall be performed, either throughout the post-closure care period, or until contamination readings fall below threshold levels and Ecology agrees to either a reduced scope or frequency of monitoring, or termination of the monitoring program altogether.

The monitoring points at the site are represented on Figure 3 from the Closure Plan, presented for reference within Appendix B of this Plan. Typical (example) readings and testing performed on samples from these monitoring points, illustrating the format of presentation, are presented on Table 11 from the Closure Plan for the site, also presented for reference in Appendix B of this Plan.

In particular, monitoring shall include the following:

- Quarterly (every three months) examination of all groundwater monitoring wells at the site, noting groundwater levels, and measuring the specific conductivity and temperature of the water shall be carried out. This includes monitoring wells MW-3A, MW-4, MW-5, MW-7, MW-8, MW-9, and MW-10. Previously existing monitoring wells MW-1, MW-2, MW-3, MW-6, and MW-11 were abandoned by the construction of the closure cap, as they were all located within the footprint of the CKD pile. The locations of all of these monitoring wells are illustrated on Figure 3 from the Closure Plan, presented in Appendix B of this Plan.
- Collection of groundwater samples from each monitoring well, for laboratory analysis.
- A visual examination and condition survey of all slopes, drainage channels, and the general condition of the cap. Any areas requiring maintenance or repair shall be noted and appropriate action taken.
- Performance of laboratory testing on groundwater samples, for the following characteristics: pH and total metals (i.e., arsenic, aluminum, cadmium, chromium, lead, mercury, selenium, silver, iron, copper, zinc, nickel, antimony, and iron), using the USEPA SW-846 methods and procedures; and alkalinity, using Standard Method 403.

These data shall be analyzed and reviewed by Dames & Moore. Evaluation of and reporting on all findings after each monitoring cycle, with formal reporting of all data to Ecology at the end of each year of post-closure monitoring will be provided.

## **6.0 FACILITY MAINTENANCE**

Maintenance of the closed CKD pile during the post-closure period shall be performed to meet the requirements of WAC 173-303-610(8)(b)(ii) and WAC 173-303-665(6).

### **6.1 MAINTENANCE OF SITE VEGETATION**

The closure of the CKD pile has provided for the development of a permanent vegetative cover as the upper component of the capping system. During the initial grow-in period of the vegetative seeding conducted during the capping operations, Lehigh shall, with the contractor responsible for the closure implementation, frequently examine the vegetation for progress in the growth. If there are gaps in the growth of the vegetation or failure of the vegetation, reapplication of the seeding shall be carried out to ensure complete vegetative cover throughout the area of the pile. Appropriate measures shall also be taken during the post-closure period if the quarterly examinations or maintenance operations indicate areas of denudation for any reason, which could contribute to erosion.

Once the vegetation has been firmly established and has matured, the maintenance of this vegetation shall commence. The grasses planned for the vegetative cover are of a nature that limited height will be attained, on the order of 12 to 14 inches. It is, therefore, planned to allow the vegetation to remain at that mature height on at least the sideslopes of the pile. This will minimize the maintenance required, and will provide an ancillary benefit of impeding the velocity of flow of precipitation downslope and thereby resisting erosion of the slope. On the top of the pile, however, periodic (as-required) mowing of the flatter top area will be arranged with a local maintenance contractor, to maintain a groomed appearance and preserve proper drainage to the stormwater channels during precipitation.

At the time of grass mowing, the maintenance contractor shall also clean and clear the bench and perimeter stormwater management channels of accumulated debris, litter, and/or siltation as may accumulate from time to time, in order to ensure that the designed run-on diversion, and run-off provisions discharge properly to the drainage course and the culverts beneath Highway 31.

## **6.2 EROSION PROTECTION**

The capping system for the CKD pile has been designed to minimize the potential for deterioration of the cap as a result of surface erosion. The primary cause of this erosion is precipitation and associated run-off. Precipitation at the site consists of both rain and snow. The provision of a permanent vegetative grass cover to the cap will retard any erosive forces which arise due to precipitation and run-off. In addition, grading of the pile has been carried out to minimize the quantities of water available to contribute to erosion. In particular:

- The perimeter stormwater management system has been designed to eliminate run-on to the surface of the closed CKD pile from off-site precipitation sources. Drainage ditches to carry off-site run-off have been constructed around the pile to appropriate discharge points. This also serves to considerably reduce the potential infiltration component of precipitation.
- Velocity is a significant component of the erosive factors of run-off. The steep sideslopes of the pile are susceptible to erosion due to fast-moving water from rainfall and snowmelt, and from wind. By the allowance of denser and higher vegetation on these slopes, the velocity of run-off shall be impeded.
- The quantity of run-off down the steep sideslopes has been restricted considerably. Site grading has been provided in such a manner that run-off from the relatively flat upper portion of the pile directed over the crest to the steep sideslopes is travelling at such a low velocity that it will quickly be assimilated into the heavily vegetated sideslopes.
- A drainage interceptor channel has been provided on the intermediate bench, designed to remove all direct run-off from the top section of the slope, thereby limiting the run-off

on the top and bottom portions of the slope to that precipitation directly falling on each segment.

- Positive surface gradients have been provided on the top of the pile, directing run-off to either GCL-lined grassy swales tied-in to the stormwater management system or down the steep sideslopes to either be assimilated by heavy slope vegetation or collected by the intermediate bench stormwater management system.

### **6.3 MINIMIZATION OF INFILTRATION**

WAC 173-303-665(6) requires that throughout the post-closure period, the infiltration of surface water through the cap to the CKD material be minimized. Maintenance of the integrity of the capping system, including the vegetative cover will also provide the benefit of inhibiting any infiltration, but with the design components of a drainage medium above the barrier, as well as the GCL barrier itself, the intrusion of any infiltration to the CKD waste is unlikely. Any surficial infiltration of precipitation into the upper layers of the capping system will in large part be absorbed by the grasses in addition to any evaporative effects.

### **6.4 STORMWATER MANAGEMENT**

Maintenance of the stormwater management facilities associated with the closure of the CKD pile will assure that run-on to the surface of the closed CKD pile from off-site sources is virtually eliminated, thus greatly decreasing the potential for erosion of the cap. Components of the stormwater management system shall be periodically inspected for damage or clogging. In addition, cleaning of debris, litter, and/or siltation of the channels and culverts will be completed, as required, at the time of the periodic grass-cutting activity.

### **6.5 REPAIRS**

Any damage to the capping system or stormwater management facilities due to erosion, instability, earthquake or other natural disaster, vandalism, animals, or any other cause shall be repaired as soon as it is detected. These repairs shall be performed as a component of the ongoing care and maintenance of the facility. Repairs shall be carried out using the same types of materials as were damaged or destroyed, in accordance with the guidance and instructions of the design engineer (the Engineer of Record) for the capping system.

If any monitoring wells or other devices required by the monitoring program are damaged or destroyed for any reason, Lehigh shall inform Ecology, and if determined to be essential to the monitoring program, the damaged device shall be repaired or replaced.

## 7.0 SUMMARY AND CLOSURE

This Post-closure Care and Maintenance Plan outlines the requirements of the post-closure period and the measures that will be followed by Lehigh to meet these criteria. Every effort shall be applied to preserve the integrity and safety of the closed CKD pile. Any problems or damages which may arise shall be remedied in accordance with the instructions of the design engineer and good engineering and construction practices. Monitoring of the groundwater will continue throughout the post-closure period in accordance with this plan and the requirements of Ecology.



# RECORD OF SURVEY FOR

**LEHIGH PORTLAND CEMENT COMPANY**  
LOCATED IN:  
SECTIONS 21, 22, 27 & 28, ALL IN  
TOWNSHIP 39 NORTH, RANGE 43 EAST, W.M.  
PEND OREILLE COUNTY, WASHINGTON  
DECEMBER 1996

## LEGAL DESCRIPTION'S FOR LEHIGH PORTLAND CEMENT CO.

### PARCEL #1:

COMMENCING AT THE SECTION CORNER COMMON TO SECTIONS 21, 22, 27 AND 28 OF TOWNSHIP 39 NORTH, RANGE 43 E. W.M., THENCE NORTH 74°40' WEST 370.91 FEET TO A POINT WHICH IS ON THE SOUTH BOUNDARY OF PLACER SURVEY 955 AND IS ALSO A CORNER OF THE CITY LIMITS OF THE TOWN OF METALINE FALLS, WA.; THENCE, DUE WEST 106.49 FEET TO A POINT AND THE TRUE POINT OF BEGINNING; THENCE, NORTH 9°50' EAST 43.8 FEET TO A POINT; THENCE, NORTH 11°37' WEST 142.2 FEET TO A POINT; THENCE, NORTH 18°44' WEST 81.8 FEET TO A POINT; THENCE, NORTH 19°16' WEST 158.9 FEET TO A POINT; THENCE, NORTH 8°35' WEST 182.4 FEET TO A POINT; THENCE, SOUTH 22°52' WEST TO A POINT; ON THE EASTERLY BOUNDARY OF THE COUNTY ROAD TO THE LESTON QUARRY; THENCE, SOUTHERLY, ALONG THE EASTERLY BOUNDARY OF SAID ROAD TO THE LESTON QUARRY, TO A POINT WHICH SAID ROAD INTERSECTS THE CITY LIMITS OF THE TOWN OF METALINE FALLS, THENCE, EAST ALONG CITY LIMITS TO THE TRUE POINT OF BEGINNING. ALL IN SECTION 21, TOWNSHIP 39 NORTH, RANGE 43 E. W.M.

### PARCEL #2:

BEGINNING AT A POINT WHERE THE WESTERLY BOUNDARY OF STATE HIGHWAY NO. 31 INTERSECTS THE CITY LIMITS OF THE TOWN OF METALINE FALLS AT A POINT ON COURSE #7 OF THAT CERTAIN INSTRUMENT RECORDED IN BOOK 1 OF MINING DEEDS, PAGE 88, RECORDS OF THE AUDITOR OF PEND OREILLE COUNTY, WA.; THENCE, NORTHERLY ALONG THE WESTERLY BOUNDARY OF SAID STATE HIGHWAY #31 TO A POINT WHERE IT INTERSECTS LOT 56, BLOCK 14 OF THE TOWN OF METALINE FALLS, THENCE, SOUTHWESTERLY, SOUTHERLY AND SOUTHERLY ALONG THE SOUTHERLY BOUNDARY OF SAID BLOCK 14 TO A POINT WHICH IS ALSO CORNER NO. 5 OF DEFANCE PLACER MINING SURVEY 955; THENCE, SOUTHERLY, EAST 118.79 FEET TO A CORNER COMMON TO THE CITY LIMITS OF THE TOWN OF METALINE FALLS AND TO PROPERTY OWNED BY THE LEHIGH PORTLAND CEMENT COMPANY; THENCE, NORTH 45 DEGREES EAST TO THE POINT OF INTERSECTION WITH STATE HIGHWAY NO. 31 AND THE POINT OF BEGINNING.

ALL IN SECTION 21, TOWNSHIP 39 NORTH, RANGE 43 E. W.M.

### PARCEL #3:

COMMENCING AT A POINT WHERE THE WEST BOUNDARY OF STATE HIGHWAY NO. 31 INTERSECTS THE CITY LIMITS OF THE TOWN OF METALINE FALLS AT A POINT ON COURSE #7 OF THAT CERTAIN INSTRUMENT RECORDED IN BOOK 1 OF MINING DEEDS, PAGE 88, RECORDS OF THE AUDITOR OF PEND OREILLE COUNTY, WA.; THENCE, SOUTHWESTERLY ALONG THE WESTERLY BOUNDARY OF SAID STATE HIGHWAY NO. 31 TO A POINT WHERE IT INTERSECTS LOT 56, BLOCK 14 OF THE TOWN OF METALINE FALLS AND TO THAT POINT WHICH IS A CORNER COMMON TO THE CITY LIMITS OF THE TOWN OF METALINE FALLS AND TO THAT POINT ALSO BEING CORNER #2 OF THE TOWN OF METALINE FALLS IN SAID BOOK 1 OF MINING DEEDS, PAGE 88; THENCE, NORTH 59°51' WEST 116.79 FEET TO A POINT; THENCE, SOUTH 22°52' WEST TO A POINT ON THE EASTERLY BOUNDARY OF THE COUNTY ROAD TO THE LESTON QUARRY; THENCE, SOUTHERLY ALONG THE EASTERLY BOUNDARY OF SAID ROAD LEADING TO THE LESTON QUARRY, A DISTANCE OF 610 FEET TO A POINT; THENCE, SOUTH 50° EAST A DISTANCE OF 325 FEET TO A POINT; THENCE, SOUTH 148 FEET TO A POINT; THENCE, SOUTH 75° EAST A DISTANCE OF 250 FEET TO A POINT; THENCE, NORTH 13°19'30" EAST TO THE POINT OF INTERSECTION OF THE BOUNDARY OF STATE HIGHWAY NO. 31 TO THE POINT OF INTERSECTION WITH THE SOUTHERLY BOUNDARY OF THAT PARCEL OF LAND CONVEYED TO THE STATE OF WASHINGTON UNDER INSTRUMENT #20896, RECORDS OF THE AUDITOR OF PEND OREILLE COUNTY, WA.; THENCE, SOUTHWESTERLY ALONG THE SOUTHERLY BOUNDARY OF SAID PARCEL CONVEYED TO THE STATE OF WASHINGTON TO THE SOUTHWEST CORNER THEREOF; THENCE, NORTH 11°49' WEST ALONG THE WESTERLY BOUNDARY OF SAID PARCEL CONVEYED TO THE STATE OF WASHINGTON TO THE INTERSECTION WITH THE WESTERLY BOUNDARY OF STATE HIGHWAY NO. 31; THENCE, NORTHERLY ALONG THE WESTERLY BOUNDARY OF STATE HIGHWAY NO. 31 TO THE POINT OF BEGINNING. EXCEPT THEREFROM ALL THAT LAND LYING WEST OF A LINE DESCRIBED AS FOLLOWS:

COMMENCING AT THE CORNER COMMON TO SECTIONS 21, 22, 27 AND 28, TOWNSHIP 39 NORTH, RANGE 43 E. W.M.; THENCE NORTH 74°40' WEST 370.91 FEET TO A POINT WHICH IS ON THE SOUTH BOUNDARY OF PLACER SURVEY 955 AND IS ALSO A CORNER TO THE CITY LIMITS OF THE TOWN OF METALINE FALLS; THENCE, NORTH 8°00' EAST TO A POINT WHICH IS A CORNER COMMON TO THE CITY LIMITS OF THE TOWN OF METALINE FALLS AND LAND OWNED BY THE LEHIGH PORTLAND CEMENT COMPANY; THENCE, NORTH 59°51' WEST 116.79 FEET; THENCE, SOUTH 22°52' WEST 78.32 FEET TO A POINT WHICH IS THE TRUE POINT OF BEGINNING OF A FOREMENTIONED "LINE"; THENCE, SOUTH 8°35' EAST 182.4 FEET TO A POINT; THENCE, SOUTH 11°37' EAST 142.2 FEET TO A POINT; THENCE, SOUTH 18°44' EAST 81.8 FEET TO A POINT; THENCE, SOUTH 19°16' WEST 158.9 FEET TO A POINT; THENCE, SOUTH 9°50' WEST TO THE POINT OF INTERSECTION WITH THE CITY LIMITS OF THE TOWN OF METALINE FALLS, SAID POINT BEING THE TERMINATION POINT OF THE FOREMENTIONED "LINE".

THAT PORTION OF THE FOLLOWING DESCRIBED PARCEL "A" LYING SOUTHWESTERLY OF A LINE DRAWN PARALLEL WITH AND 30 FEET SOUTHWESTERLY OF STATE HIGHWAY NO. 31, METALINE FALLS, NORTH.

THAT PORTION OF THE SOUTHWEST QUARTER OF SECTION 22, TOWNSHIP 39 NORTH, RANGE 43 EAST OF THE WILLAMETTE MERIDIAN, BEING A PART OF THE DEFANCE PLACER CLAIM LOCATED AS FOLLOWS:

BEGINNING AT A POINT 75 FEET NORTH OF CORNER NO. 2 OF THE DEFANCE CLAIM AND ON A PROJECTION OF A LINE FROM CORNER NO. 1 TO CORNER NO. 2 OF THE DEFANCE CLAIM; THENCE NORTH 78°11' EAST, 363 FEET TO THE SOUTHEAST CORNER OF THIS TRACT; THENCE NORTH 11°17' WEST, 300 FEET TO THE NORTHEAST CORNER; THENCE SOUTH 78°11' WEST, 363 FEET TO THE NORTHWEST CORNER; THENCE SOUTH 11°17' EAST, TO THE SOUTHWEST CORNER AND THE PLACE OF BEGINNING.

### DRAINAGE EASEMENT - (AUDITOR'S #238103)

THIS NONEXCLUSIVE DRAINAGE EASEMENT IS GRANTED THIS 25TH DAY OF APRIL, 1997, BY PEND OREILLE COUNTY, A POLITICAL SUBDIVISION OF THE STATE OF WASHINGTON TO LEHIGH PORTLAND CEMENT COMPANY, A PENNSYLVANIA CORPORATION FOR THE PLACEMENT AND MAINTENANCE OF A STORM DRAIN CATCH BASIN AND STORM WATER DRAINAGE LINES CONNECTED THERETO LOCATED IN ROAD RIGHT-OF-WAY OWNED BY PEND OREILLE COUNTY, SAID EASEMENT DESCRIBED AS FOLLOWS:

BEGINNING AT THE MOST SOUTHWESTERLY CORNER OF PARCEL 3 AS SHOWN ON A RECORD OF SURVEY, DATED JANUARY 16, 1997, FILED IN SAID COUNTY'S AUDITOR'S OFFICE, DOCUMENT NO. 236894; THENCE NORTH 07°00'00" WEST, 148.00'; THENCE NORTH 50°00'00" WEST, 325.00' TO A POINT ON A CURVE TO THE LEFT, SAID CURVE BEING CONCAVE TO THE SOUTHWEST, HAVING A RADIUS OF 300.00' AND AN ARC DISTANCE OF 218.47' TO THE POINT OF TANGENCY; THENCE NORTH 07°00'00" WEST, 175.83' TO THE TRUE POINT OF BEGINNING; THENCE SOUTH 05°48'09" WEST, 26.66' TO THE CENTER OF SAID CATCH BASIN.

### SURVEYOR'S NOTES

- ① - FND 5/8" REBAR W/ ALUMIN. CAP
- ② - FND 5/8" REBAR
- ③ - SECTION CORNER IS LOCATED IN CKD FILE CALCULATED POSITION FROM FND RP'S PER R.O.S. 955
- ④ - CALCULATED POSITION OF CORNER 2 OF MS 955 PER R.O.S. 198128
- ⑤ - THE R.O.W. LOCATION WAS CALCULATED FROM FOUND MONUMENTATION OF R.O.S. 555 AND AS-BUILT SURVEY OF THE CENTERLINE OF EXISTING ROAD, NO MONUMENTATION OF RECORD WAS FOUND ON FILE AT THE W.S.D. OFFICE
- ⑥ - CORNER 5 OF MS 955 WAS CALCULATED FROM DEED CALLS AND OLD PLACER SURVEY'S
- ⑦ - DEED OVERLAPS AS-BUILT LOCATION OF QUARRY RD.



**HAHN ENGINEERING**  
NORTH 8623 B DIVISION  
SPOKANE, WA. 89208  
(509) 467-1550  
FAX (509) 467-8189

### LEGEND

- - FOUND AS NOTED
- - SET 1/2" REBAR W/Y.P.C. "KITZAN #33141"
- CB - CATCH BASIN
- - EDGE OF CKD FILE
- CKD - CEMENT KILN DUST

### NOTES

1. LEHIGH PORTLAND CEMENT COMPANY WILL RESTRICT DISTURBANCE OF THE CKD PILE IN ACCORDANCE WITH THE REQUIREMENTS OF WAC 173-303-610 (9).
2. THE CKD PILE CONTAINS APPROXIMATELY 544,000 TONS OF CKD AS PER DAMES & MOORE CALCULATIONS FROM PREVIOUS SURVEY. THE PILE WAS DESIGNATED AS DANGEROUS WASTE BY THE STATE OF WASHINGTON DEPT. OF ECOLOGY AND WAS CLOSED DURING 1996 IN ACCORDANCE WITH WAC 173-303-610 (2), WAC 173-303-665 AND 40 CFR PART 265 SUBPART N.
3. FEBRUARY 2, 1997 - THE PURPOSE OF THIS SURVEY IS TO INCLUDE PARCELS 1, 2 AND TRIANGULAR PARCEL SOUTHERLY OF STATE ROUTE 31, BEING A PORTION FORMERLY OWNED BY THE STATE OF WASHINGTON DEPT. OF TRANSPORTATION TO PREVIOUS FILED SURVEY DATED: JAN. 16, 1997 IN AUDITOR'S FILE #236894.

### SURVEYOR'S CERTIFICATE

THIS MAP CORRECTLY REPRESENTS A SURVEY MADE BY ME OR UNDER MY DIRECTION IN CONFORMANCE WITH THE REQUIREMENTS OF THE SURVEY RECORDING ACT AT THE REQUEST OF THE STATE CONSTRUCTION IN DECEMBER, 1996  
RUDY F. KITZAN, L.S. #33141

### AUDITOR'S CERTIFICATE

AT 1200 P.M. IN BOOK 3 OF SURVEYS AT PAGE 344  
FILED FOR RECORD THIS 07 DAY OF May, 1998  
AT THE REQUEST OF Hahn Engineering  
COUNTY AUDITOR Ann Swenson by J. Olsen deputy

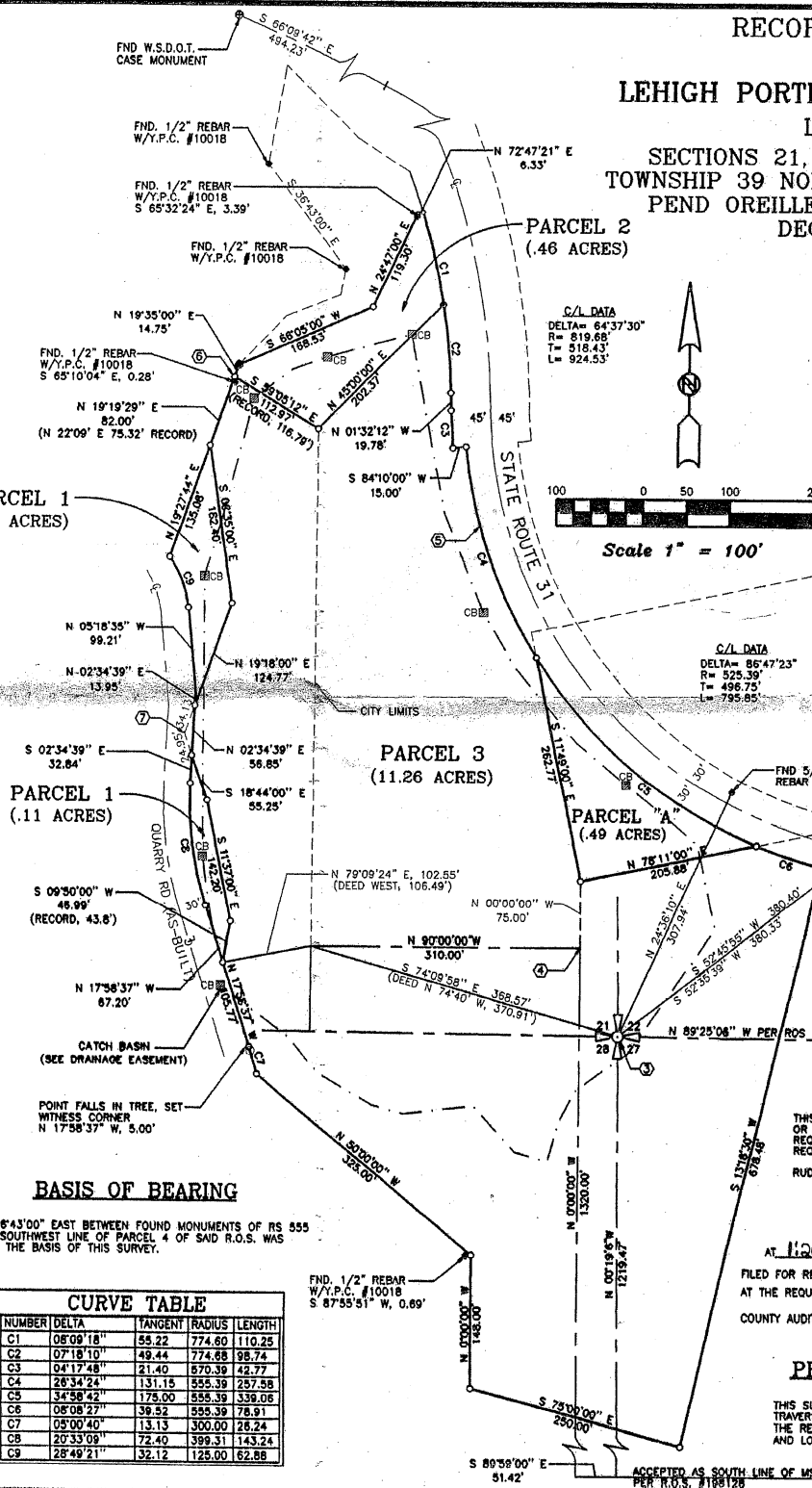
### PROCEDURES AND EQUIPMENT

THIS SURVEY WAS PERFORMED WITH A SOKKIA SET 4 USING FIELD TRAVERSE PROCEDURES. THE LINEAR AND ANGULAR CLOSURE EXCEED THE REQUIREMENTS OF WAC 332-130-000 (1) (c) FOR CITY, CENTRAL AND LOCAL BUSINESS AND INDUSTRIAL AREAS.

ACCEPTED AS SOUTH LINE OF MS956  
PER R.O.S. #108128

S-21-22,27,28-139N-R43 E. W.M.

### PARCEL 1 (.23 ACRES)



### BASIS OF BEARING

SOUTH 36°43'00" EAST BETWEEN FOUND MONUMENTS OF RS 555 ON THE SOUTHWEST LINE OF PARCEL 4 OF SAID R.O.S. WAS USED AS THE BASIS OF THIS SURVEY.

NUMBER	DELTA	TANGENT	RADIUS	LENGTH
C1	08°09'18"	58.22	774.60	110.25
C2	07°18'10"	49.44	774.68	98.74
C3	04°17'48"	21.40	870.39	42.77
C4	26°34'24"	131.15	555.39	257.58
C5	34°58'42"	175.00	555.39	339.05
C6	08°08'27"	36.52	555.39	78.91
C7	05°00'40"	13.13	300.00	26.24
C8	20°33'09"	72.40	399.31	143.24
C9	28°49'21"	32.12	125.00	62.88

FND. 1/2" REBAR  
W/Y.P.C. #10018  
S 87°55'51" W, 0.89'



## DETERMINATION OF NONSIGNIFICANCE

**Description of proposal:** The proposed project will cleanup metals and high pH contamination in groundwater downgradient of the Closed CKD Pile in Metaline Falls. The metals include arsenic, chromium, lead and manganese. Concentrations of pH, arsenic, lead, chromium, and manganese in the groundwater exceed MTCA cleanup levels. Treatment will occur through the construction of an in situ (in place) treatment system that will intercept contaminated groundwater from the Closed CKD Pile and treat it prior to discharge to Sullivan Creek. The groundwater treatment system consists of two primary components: a funnel-and-gate treatment system and a gravity drain that will be constructed under the southern portion of the Closed CKD Pile. Construction will occur in the approximately 4 acres between the Closed CKD Pile and Sullivan Creek.

**Proponent:** Lehigh Cement Company

**Location of proposal, including street address if any:** The proposed project site is in Metaline Falls, Pend Oreille County, Washington at approximately milepost 14.7 along State Route 31, in SE ¼ Sec. 21, T. 39N, R. 43E. The groundwater remediation system will be installed on property just north and east of the Closed CKD Pile, located between State Route 31 and Sullivan Creek. In addition, the gravity drain will be installed beneath the southern most portion of the Closed CKD Pile. Lehigh owns all of the land on which the proposed project will be constructed and operated.

**Lead agency:** Washington State Department of Ecology

The lead agency for this proposal has determined that it does not have a probable significant impact on the environment. An environmental impact statement (EIS) is not required under RCW 43.21C.030(2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available to the public on request.

☐ There is no comment period for this DNS.

☐ This DNS is issued after using the optional DNS process in WAC 197-11-355. There is no further comment period on the DNS.

☒ This DNS is issued under WAC 197-11-340(2); the lead agency will not act on this proposal for 14 days from the date below.

Comments must be submitted by February 24, 2006.

**Responsible official:** Flora J. Goldstein

**Position/title:** Section Manager, Toxics Cleanup Program

**Address:** 4601 N Monroe, Spokane, WA 99205-1295

**Phone:** 509-329-3568

**Date:** January 7, 2006

**Signature**

## ENVIRONMENTAL CHECKLIST

### Purpose of checklist:

The State Environmental Policy Act (SEPA), chapter 43.21C RCW, requires all governmental agencies to consider the environmental impacts of a proposal before making decisions. An environmental impact statement (EIS) must be prepared for all proposals with probable significant adverse impacts on the quality of the environment. The purpose of this checklist is to provide information to help you and the agency identify impacts from your proposal (and to reduce or avoid impacts from the proposal, if it can be done) and to help the agency decide whether an EIS is required.

### Instructions for applicants:

This environmental checklist asks you to describe some basic information about your proposal. Governmental agencies use this checklist to determine whether the environmental impacts of your proposal are significant, requiring preparation of an EIS. Answer the questions briefly, with the most precise information known, or give the best description you can.

You must answer each question accurately and carefully, to the best of your knowledge. In most cases, you should be able to answer the questions from your own observations or project plans without the need to hire experts. If you really do not know the answer, or if a question does not apply to your proposal, write "do not know" or "does not apply." Complete answers to the questions now may avoid unnecessary delays later.

Some questions ask about governmental regulations, such as zoning, shoreline, and landmark designations. Answer these questions if you can. If you have problems, the governmental agencies can assist you.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

### Use of checklist for nonproject proposals:

Complete this checklist for nonproject proposals, even though questions may be answered "does not apply." IN ADDITION, complete the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D).

For nonproject actions, the references in the checklist to the words "project," "applicant," and "property or site" should be read as "proposal," "proposer," and "affected geographic area," respectively.

A. BACKGROUND

1. Name of proposed project, if applicable:

**MTCA Groundwater Remediation  
Closed Cement Kiln Dust (CKD) Pile Site  
Metaline Falls, Washington**

2. Name of applicant:

**Lehigh Cement Company**

3. Address and phone number of applicant and contact person:

**7660 Imperial Way  
Allentown, PA 18195  
(610) 530-5440**

4. Date checklist prepared:

**July 2005**

5. Agency requesting checklist:

**Department of Ecology**

6. Proposed timing or schedule (including phasing, if applicable):

**Detailed design of the groundwater remediation system is expected to begin in the fall of 2005 following Ecology's finalization of the Cleanup Action Plan. Construction is anticipated in 2006 and will take approximately 5 months to complete. The system will operate indefinitely.**

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

**No.**

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

**Characterization of the CKD, Biomed Research Laboratories, 1984**

**Hydrogeologic investigation and closure studies, Cemtech, Inc., 1990**

**Hydrogeologic investigation and groundwater plume evaluation, Dames & Moore, 1992**

**Preliminary Site Characterization Report, Dames & Moore, Inc., December 1992**

**Addendum Preliminary Site Characterization Report, Dames & Moore, Inc., 5 October 1993**

**Additional hydrogeologic investigation, geotechnical evaluation, and plume evaluation, Dames & Moore, 1993-1995**

**Draft Closure Plan for CKD Pile, submitted to Ecology, August 1994**

**Final Closure Plan for CKD Pile, submitted July 1995**

**On-going post closure monitoring of groundwater and general site conditions, Dames & Moore and GeoSyntec, 1996-2000**

**Groundwater Data Transmittals, Dames & Moore to Lehigh Portland Cement Co., 1997 & 1998**

**Aquatic resources assessment of Sullivan Creek, AIP and Associates, 1998**

**Groundwater Data Transmittals, GeoSyntec to Lehigh Portland Cement 1998**

**Interim Progress Report No. 1, Subsurface Treatability Study, GeoSyntec, 2000**

**In Situ Treatment Wall Design Drawings, GeoSyntec, 2001**

**Quarterly Project Status Reports to Department of Ecology, GeoSyntec, 2000, 2001, 2002, 2003, 2004, and 2005**

**Project Status Meetings, GeoSyntec, 2002, 2003, 2004, and 2005**

**Feasibility Study Technical Memorandum, GeoSyntec, May 22, 2003**

**In Situ Treatment Wall Construction Report, GeoSyntec, 2003**

**Draft Final Report, Remedial Investigation, Closed Cement Kiln Dust Pile, Metaline Falls, WA, October 5, 2000**

**Pilot Treatment Construction Report, submitted April 2003**

**Draft Feasibility Study Technical Report, Closed Cement Kiln Dust Pile,  
Metaline Falls, WA, November 12, 2003**

**Revised Draft Feasibility Study Technical Report, Closed Cement Kiln  
Dust Pile, Metaline Falls, WA, March 3, 2005**

**Lehigh Cement Company Closed CKD Pile, Metaline Falls,  
Wetland Determination Report, Adolfson Associates, Inc., July 2005.**

**Lehigh Cement Company Closed CKD Pile, Metaline Falls,  
Biological Evaluation, Adolfson Associates, Inc., In Progress.**

**Draft Cleanup Action Plan, January 2006.**

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

**We do not know of other pending applications for governmental approvals of other proposals that would directly affect the Proposed Project. The Washington Department of Transportation is planning to make improvements to State Route 31 in the vicinity of the Proposed Project. WDOT may require access to Lehigh's property on or around the Proposed Project site to complete these improvements. However, the highway improvements are not expected to interfere with the groundwater remediation proposal discussed in this Checklist.**

10. List any government approvals or permits that will be needed for your proposal, if known.

**RCW 70.105D.090 exempts remedial actions conducted under a consent decree, order, or agreed order from the procedural requirements of RCW chapters 70.94 (air), 70.95 (solid waste), 70.105 (hazardous wastes), 75.20 (hydraulic permit), 90.48 (water quality), and 90.58 (shorelines), and from the procedural requirements of any laws requiring or authorizing local government permits or approvals. Ecology ensures compliance with the substantive requirements adopted pursuant to such laws, and consults state agencies and local governments charged with implementing these laws. Substantive requirements of state and local permits that must be complied with include:**

- Hydraulic Project Approval from the Department of Fish and Wildlife;**
- shoreline permit from Pend Oreille County;**
- floodplain development permit from Pend Oreille County; and**

- building, clearing, and grading permits from Pend Oreille County.

**The Proposed Project is not exempt from Federal permit requirements and Lehigh will apply to the U.S. Army Corps of Engineers for a Section 404 permit and to Ecology for an NPDES/state waste discharge permit and Section 401 Water Quality Certification.**

**In addition, Ecology must finalize the Cleanup Action Plan.**

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

**The Proposed Project will remediate contaminated groundwater downgradient of the Closed CKD Pile in Metaline Falls.**

**Lehigh Cement Company (Lehigh) operated a Portland cement production plant in Metaline Falls, Washington, from the early 1900s until 1989. Cement Kiln Dust (CKD) was generated at the plant as a byproduct of the cement production process. During the period that the plant was in operation, Lehigh periodically moved the CKD from the production plant to the CKD Pile, which is between the former plant location and State Route 31 (Figure 1). To the east of State Route 31 is a floodplain that gently slopes toward Sullivan Creek, located about 250 to 300 feet east of State Route 31.**

**In 1996, Lehigh implemented an Ecology-approved Closure Plan by constructing a final cover on the surface of the approximately 7.5-acre CKD Pile to reduce surface water infiltration into the CKD and by constructing a stormwater management system to treat surface water runoff. Following completion of the Closure Plan, Lehigh implemented a program of on-going groundwater monitoring. The monitoring program indicated that leachate was emanating from the Closed CKD Pile and that the leachate was affecting groundwater beneath, and downgradient of, the Closed CKD Pile.**

**Downgradient of the Closed CKD Pile, groundwater is characterized by high pH, decreased oxidation reduction potential, and arsenic concentrations greater than 5  $\mu\text{g/L}$  (or parts per billion [ppb]). Arsenic is not present in significant concentrations within the CKD. Surveys indicate that groundwater elevations fluctuate seasonally and that groundwater contacts the base of the Closed CKD Pile. In addition, some groundwater flows laterally into the buried sidewalls of the Closed CKD Pile and water is also trapped in the CKD matrix as a result of infiltration of precipitation that**

occurred prior to Pile closure in 1996. Contact with CKD results in high pH in the groundwater. Under high pH conditions, groundwater dissolves naturally-occurring arsenic from the native soils. Groundwater with elevated pH and arsenic levels seeps into, and flows overland to (in a localized area), Sullivan Creek.

Lehigh's Proposed Project will treat contaminated groundwater downgradient of the Closed CKD Pile. Treatment will occur through the construction of an in situ treatment system that will intercept contaminated groundwater from the Closed CKD Pile and treat it prior to discharge to Sullivan Creek. Details of the in-situ treatment technology are described in the Revised Draft Feasibility Study Technical [GeoSyntec, 2005].

The groundwater remediation system consists of two primary components: a funnel-and-gate treatment system (FGT), and a gravity drain that will be constructed under the southern portion of the Closed CKD Pile (Figure 2). Construction of the Proposed Project will occur in the approximately 4 acres between the Closed CKD Pile and Sullivan Creek (Figure 1).

The FGT includes subterranean slurry walls installed downgradient of the Closed CKD Pile. The slurry walls will intercept the CKD-affected groundwater on the east side of State Route 31 and passively funnel the groundwater toward a central treatment zone where Lehigh will use an in situ technology to neutralize high pH and precipitate out arsenic in the groundwater. After treatment, the water will migrate through a subsurface discharge corridor and enter Sullivan Creek (Figure 3). Subterranean gravel walls (French drains) on the upgradient side of the slurry walls will convey groundwater along the slurry wall funnel to the treatment zone (Figure 3).

The second primary component of the groundwater remediation system is the gravity drain. A perforated drain pipe will be installed under the southernmost margins of the Closed CKD Pile using horizontal directional drilling techniques. The gravity drain is a source-control technology that will redirect unaffected groundwater away from the Closed CKD Pile so that it will not contact the CKD. The gravity drain will intercept groundwater moving northward toward the CKD and convey it to the southern tip of the south slurry wall (Figure 2). Because the gravity drain intercepts water before it enters the Closed CKD Pile, water from the gravity drain should meet water quality criteria for discharge into Sullivan Creek without treatment. If testing of the gravity drain-intercepted water indicates that treatment is necessary, the design will include the flexibility to convey the water to the treatment zone, if needed.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street



address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

**The Proposed Project site is in Metaline Falls, Washington at approximately milepost 14.7 along State Route 31, in SE 1/4 Sec. 21, T. 39N, R. 43E. The groundwater remediation system will be installed on property just north and east of the Closed CKD Pile, located between State Route 31 and Sullivan Creek. In addition, the gravity drain will be installed beneath the southernmost portion of the Closed CKD Pile. Lehigh owns all of the land on which the Proposed Project will be constructed and operated. Figure 2 shows the approximate layout of the proposed groundwater remediation system.**

B. ENVIRONMENTAL ELEMENTS (note for text file version: in this version, the column on the right side of the form for lead agency review is missing. The column headings should read "TO BE COMPLETED BY APPLICANT" for the text on the left side of the page and "EVALUATION FOR AGENCY USE ONLY" for a blank column on the right side of the page.)

1. Earth.

a. General description of the site (circle one): **Flat**, rolling, hilly, steep slopes, mountainous, other \_\_\_\_\_

**The area where the groundwater remediation system will be constructed is generally flat. The Closed CKD Pile rises approximately 90 feet above State Route 31 to a gently-sloping upper deck (Figure 1).**

b. What is the steepest slope on the site (approximate percent slope)?

**As stated in the answer to the previous question, The Proposed Project construction area is relatively flat, with an increase in slope to approximately 1H:1V (Horizontal to Vertical) on the banks of Sullivan Creek.**

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.

**There are three geologic strata at the Proposed Project site. Bedrock is the deepest stratum. Overlying the bedrock are glacial sediments that consist of sandy silt and clayey silt. Finally, Sullivan Creek eroded a bowl**

(the Holocene Alluvium) into the glacial sediments, which is the third stratum. The Holocene Alluvium includes gravels with occasional cobbles and boulders and interspersed zones of more clayey, silty, and sandy materials. According to the Soil Survey of Pend Oreille County, soils at this site are Martella silt loam and Sacheen variant silt loam.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

**A historic landslide occurred in glacial sediments to the south of and upgradient from the Closed CKD Pile, approximately 600 feet from the construction area (Figure 1). The landslide is described in the June 1997 Closure Report. The area where the groundwater remediation system will be constructed is relatively flat and is not expected to be susceptible to landslides.**

e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate source of fill.

**Slurry wall construction necessary to construct the FGT will require an earthen working platform to be constructed along the slurry wall alignment. Approximately 5,000 cubic yards of compactable soils will form the platform. Construction of the slurry walls will require the excavation of approximately 1,200 cubic yards of trenches, followed initially by backfill with biodegradable slurry to hold open the trench, and finally by a soil-slurry mixture that will cure into an impermeable groundwater cut-off wall. The upper few feet of the slurry walls will be capped with clay to limit stormwater infiltration and to provide a physical barrier to accessing the slurry. Upgradient of the slurry walls a subterranean gravel drain (French drain) will be constructed to convey the intercepted groundwater to the central treatment zone. Construction of the gravel drain will require the excavation of approximately 1,100 cubic yards of soil, followed by backfill with coarse gravel. Construction of the central treatment zone will involve the excavation of approximately 10,000 cubic yards of native material. This area will also be backfilled with coarse gravel. With the exception of the slurry mixtures, which will be specially designed for our purposes, the gravel backfill materials are expected to come from a commercially obtained local source.**

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

**The Proposed Project will require excavation, clearing, and grading within an approximately 4-acre area east of State Route 31, between the Closed CKD Pile and Sullivan Creek (Figure 2). In addition, the Proposed Project will result in the clearing of approximately 75 linear feet of vegetation along**

Sullivan Creek for construction of the central treatment zone and discharge corridor (Figure 2). Erosion and sedimentation could occur during construction if not properly controlled. Construction activities will be subject to the provisions of an NPDES permit and Lehigh will implement best management practices to control and limit erosion and sedimentation during construction as described in Section B(1)(h). To avoid streambank erosion following construction, Lehigh will reinforce the outlet of the discharge corridor with rip rap (Figure 3).

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

The Closed CKD Pile was covered with an engineered vegetated low-permeability cap during closure in 1996. The cap covers roughly 7.5 acres of the 11.5-acre Proposed Project site, or approximately 65% of the total land area at the site. A small amount of impervious surface (approximately 900 square feet) will be added to the Proposed Project site as a result of expanding the existing structure. With this addition, approximately 0.2% of additional Proposed Project site surface will be covered with impervious surface.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

An erosion control plan will be developed for construction. The plan will include standard erosion control measures including, but not limited to, use of silt curtains and hay bales to slow and/or filter runoff. In addition, excavations will be left open for the shortest time possible. Soil stockpiles will be covered during periods of precipitation. The erosion protection that is immediately adjacent to Sullivan Creek will be installed during the summer season, when water levels are expected to be low. This will reduce the potential for sediment releases to the creek. Additional measures may include silt fencing, diversion berms, and hay bales, as appropriate.

Excavation equipment will operate landward of the Sullivan Creek ordinary high water mark. Soil will be pulled away from Sullivan Creek, toward the excavation equipment, during construction of the zone of the gravel corridor where it emerges at the Sullivan Creek banks. Measures such as those described previously will be taken to control erosion and turbidity during these activities. An in-water sediment containment boom may be used if construction activities resulted in turbidity levels that exceed state standards.

2. Air

a. What types of emissions to the air would result from the proposal (i.e., dust, automobile, odors, industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.

**Construction activities will generate on-site dust and emissions from earthmoving equipment operation and workers' vehicles. These emissions are expected to be temporary, minor, and largely confined to the Proposed Project site.**

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

**None known**

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

**Dust generation during construction will be controlled by wetting exposed surfaces, and other typical dust-suppression techniques.**

3. Water

a. Surface:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

**Sullivan Creek flows in a northerly direction just east of the Proposed Project site, approximately 300 feet from the toe of the Closed CKD Pile. Sullivan Creek is a tributary to the Pend Oreille River, which is located about 0.5 miles downstream from the Proposed Project site. A small (0.07-acre) palustrine emergent wetland is located on the site in proximity to the location of the FGT (Figure 2). The wetland has been delineated and rated pursuant to federal, state, and local requirements. The wetland is rated a Category IV wetland.**

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

**Yes. Most of the FGT will be constructed within 200 feet of Sullivan Creek. In addition, the discharge corridor for the FGT will extend to the bank of Sullivan Creek. Figure 2 shows a layout of the proposed groundwater remediation system, and Figure 3 shows additional details for**

**the construction area near Sullivan Creek and the adjacent, disturbed Category IV wetlands. The conceptual design of the groundwater remediation system is described in the Revised Feasibility Study Technical Report.**

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

**The gravel corridor will passively discharge to Sullivan Creek through a spillway-type structure on the western bank of the stream (Figure 2). Up to approximately 500 cubic yards of erosion protection material (riprap) will be placed waterward of the ordinary high water mark (See Figure 3). The riprap armoring will be designed to be consistent with the Washington State Department of Fish and Wildlife's Integrated Streambank Protection Guidelines [WDFW, 2003]. Construction of the FGT will result in the placement of fill materials within the adjacent 0.07-acre Category IV wetland.**

**With the exception of the slurry mixtures, which will be specially designed for the project based on operational requirements, the gravel backfill materials are expected to come from a commercially obtained local source.**

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

**No surface water withdrawals or diversions will occur as a result of the long-term operation of the Proposed Project. Because a portion of the construction of the FGT discharge corridor will occur below and waterward of the ordinary high water mark of Sullivan Creek, erosion control methods will be used, as needed, to meet Washington surface water standards.**

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

**A large portion of the proposed project lies within the 100-year floodplain.**

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

**Yes, the Cleanup Action Plan selects the groundwater remediation system, which was described previously. The selected groundwater remediation system will result in approximately 50,000 to 150,000 gallons per day of treated groundwater being discharged to Sullivan Creek.**

**Discharges from the remediation system are expected to meet NPDES permit limits.**

b. Ground:

1) Will ground water be withdrawn, or will water be discharged to ground water? Give general description, purpose, and approximate quantities if known.

**Following treatment, groundwater will be discharged through a subsurface discharge corridor that empties into Sullivan Creek. This system and its purpose are described above in response to Question A.11. The quantities are discussed above in response to Question B.6.**

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals\_\_\_\_\_ ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

**None.**

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

**The closure of the CKD Pile in 1996 included installation of a geosynthetic and soil cover, and drainage and surface water management systems constructed on top of and adjacent to the CKD Pile. Runoff collected in this system is initially routed to a sedimentation basin for eventual discharge to Sullivan Creek (Figure 2).**

**No additional stormwater facilities will be constructed as part of the Proposed Project.**

**Stormwater that falls on the land between State Route 31 and Sullivan Creek either infiltrates into the ground or flows into the stream via overland flow.**

2) Could waste materials enter ground or surface waters? If so, generally describe.

**No. Stormwater runoff will not come in contact with any waste materials (including any industrial materials or activities) at the Proposed Project site. All chemicals used on-site will be stored inside the building.**

d. Proposed measures to reduce or control surface, ground, and runoff water impacts, if any:

**The treatment of groundwater will reduce the arsenic level and lower the pH level such that the water meets NPDES permit limits prior to discharge to Sullivan Creek.**

#### 4. Plants

a. Check or circle types of vegetation found on the site:

deciduous tree: **alder**, **maple**, aspen, **other**

evergreen tree: **fir**, **cedar**, pine, **other**

**shrubs**

**grass**

pasture

crop or grain

wet soil plants: cattail, buttercup, bullrush, skunk cabbage, **other**

water plants: water lily, eelgrass, milfoil, other

other types of vegetation

**Typical upland vegetation includes paper birch, Douglas fir, beaked hazelnut, snowberry, and Oregon grape.**

b. What kind and amount of vegetation will be removed or altered?

**Most of the area affected by construction of the FGT is currently graveled; however, some areas of native vegetation, emergent wetland, and native upland forest will be removed or altered during construction. In addition, construction will affect vegetated areas around the existing building. Approximately 0.7 acres of currently vegetative areas will be cleared for construction of the FGT. The vegetation beyond the limits of the engineered structures of the FGT facility that is disturbed during construction will be restored and these areas will be allowed to re-vegetate (See Section 4(d)).**

c. List threatened or endangered species known to be on or near the site.

**The State Department of Natural Resources does not identify any known populations of state or federally listed threatened or endangered plant species occurring or in proximity to the project site. The USFWS has identified that one federally listed plant species, the Ute ladies'-tresses, may occupy habitats that are common in Pend Oreille County, although**

there is no documented occurrence of Ute ladies'-tresses in Pend Oreille County (WDNR, 2005; NatureServe Explorer, 2005).

Common Name	Scientific Name	ESA Status	Jurisdiction
Ute ladies'-tresses	<i>Spiranthes diluvialis</i>	Threatened	USFWS

Ute ladies'-tresses occupies undisturbed wetland and riparian habitats. In general, the species may occur in broad intermontane valley plains. Although Pend Oreille County may provide areas that could support populations of Ute Ladies'-tresses, the current distribution in Washington includes three of the four known sites occurring along the Columbia River in Chelan and Okanogan Counties. No Ute ladies'-tresses were observed on the subject site and the site does not appear to support the very specific hydrologic regime necessary for the survival of this rare plant. The project will have no impact on Ute ladies'-tresses.

Washington Department of Natural Resources, Washington Natural Heritage Program (WNHP). <http://www.dnr.wa.gov/nhp/refdesk/fguides.html> (Accessed: July 25, 2004).

NatureServe. 2005. NatureServe Explorer: An online encyclopedia of life [web application]. Version 4.5. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: July 26, 2005 ).

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

The Proposed Project will include the enhancement of approximately 0.7 acres of existing degraded habitat along the western bank of Sullivan Creek. Enhancement will include the removal of trash, junk, and other man-made materials from along the stream bank. The enhancement may also include revegetation with woody tree and shrub species in areas that are currently unvegetated or that are only vegetated with grass, and underplanting areas with coniferous species that are currently dominated by deciduous shrubs or deciduous forest.

## 5. Animals

a. Circle any birds and animals which have been observed on or near the site or are known to be on or near the site:

birds: hawk, heron, eagle, songbirds, other:

mammals: deer, bear, elk, beaver, other:

fish: bass, salmon, trout, herring, shellfish, other:



WDFW PHS database (2005) does not identify any Priority Habitats Species polygons or Wildlife Heritage Points on or adjacent to the Proposed Project; however, WDFW does identify that the general vicinity is known to contain regular concentrations of Rocky Mountain elk, mountain goat, and waterfowl. In addition, WDFW maps several Wildlife Heritage Points within one mile of the Proposed Project site. Mapped natural heritage points include observed occurrences of individual great grey owl, Canada lynx, common loon, and slimy sculpin. Breeding occurrences (nest sites) for bald eagle and osprey also occur in the general vicinity of the Proposed Project.

The closest bald eagle nest is located approximately 1.3 miles southwest of the project along the mainstem Pend Oreille River (WDFW Priority Habitats and Species Database, 2005). No specific perching or roosting trees have been identified in the project vicinity. Bald eagles could potentially forage within the Sullivan Creek system; however, they are more likely to forage along the mainstem Pend Oreille River to the west of the project. General noise and disturbance would occur during construction, but no highly disturbing activities are expected to be required. Since, there are ample foraging opportunities along the mainstem Pend Oreille River and since no documented nest sites, perches, or roosts have been identified within 1.0-mile of the project, the likelihood of impacts to eagles are anticipated to be discountable.

b. List any threatened or endangered species known to be on or near the site.

There are several ESA listed species that may occur in Pend Oreille County. Much of county is undeveloped forest or rangeland. The USFWS identifies that six different ESA-listed species may occur in the vicinity of the project. Of these six species, three have been documented as occurring in proximity to the project site by WDFW (2005), although no documented occurrence of these species on or adjacent to where work will occur. These species include grizzly bear, Canada lynx, and bald eagle. A forth species, bull trout, may have historically been present in Sullivan Creek, but a population of bull trout are not known to be present in the watershed (Andonagui, 2003). The USFWS has designated Sullivan Creek as Critical Habitat for bull trout. Andonagui (2003) reports that bull trout may have historically occurred in the Pend Oreille River, however, viable populations of bull trout are thought to be extirpated from the Pend Oreille River and its tributaries between Albeni Falls dam in Idaho and Boundary dam in Washington. Surveys conducted in the Sullivan Creek watershed have not identified any reproducing populations of bull trout in Sullivan Creek. There have been only 33 documented observations of bull trout between Albeni Falls and Boundary dams since 1975. There have been no confirmed observations of live bull trout in Sullivan Creek. A dead bull trout was observed along the bank of the stream at river mile 0.65

(upstream from the project site) in 1993; however, subsequent snorkel surveys in the vicinity were not able to find other occurrences. Any occurrence of bull trout in Sullivan Creek would be extremely rare and the Proposed Project is not likely to result in adverse affects to bull trout. Bull trout, if present, are anticipated to benefit from the potential water quality benefits of the Proposed Project.

Common Name	Scientific Name	ESA Status	Jurisdiction
Canada Lynx	<i>Lynx Canadensis</i>	Threatened	USFWS
Bull trout	<i>Salvelinus confluentus</i>	Threatened	USFWS
Bald eagle	<i>Haliaeetus leucocephalus</i>	Threatened	USFWS
Grizzly Bear	<i>Ursus arctos horribilis</i>	Threatened	USFWS

The project site is a heavily disturbed industrial property in close proximity to the Town of Metaline Falls. Although ESA-listed species may be present in the forest and rangelands around the town, occurrence of these species on the actual site of the proposed facility where work would occur is not likely.

Andonagui, C. 2003. *Bull Trout Habitat Limiting Factors Report for Water Resource Inventory Area (WRIA) 62 (Pend Oreille County, Northeast Washington State)*. Washington State Conservation Commission. Olympia, Washington.

Washington Department of Fish and Wildlife. 2005. *Priority Habitats and Species Database*. Washington Department of Fish and Wildlife. Olympia, Washington

c. Is the site part of a migration route? If so, explain.

The Proposed Project area has been heavily disturbed. The site is located adjacent to State Route 31. The site itself has not been identified as part of a migration route for any state priority wildlife species. Sullivan Creek has been identified as a migration corridor for state listed priority fish species that may use the stream for spawning or rearing.

d. Proposed measures to preserve or enhance wildlife, if any:

One purpose of the Proposed Project is to protect the waters of Sullivan Creek, which will enhance the fish habitat in the stream. Work below the ordinary high water mark in Sullivan Creek will only occur during allowed in-water work windows as identified by WDFW, the Corps of Engineers, and USFWS.

6. Energy and natural resources

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

**Electricity will be used to operate the treatment facility.**

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

**No.**

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

**Does not apply.**

## 7. Environmental health

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

**During construction, workers may be exposed to high pH water. This risk will be managed through good construction safety practices. In addition, carbon dioxide will be used to treat the groundwater. Carbon dioxide used in the treatment process will be stored indoors in the adjacent storage building. Carbon dioxide is currently stored on-site in the existing storage building for use for on-going pilot treatment facility. The existing building will be expanded to allow for additional carbon dioxide storage for use in the permanent groundwater remediation system.**

1) Describe special emergency services that might be required.

**We do not anticipate that any special emergency services will be required during construction or operation of the Proposed Project**

2) Proposed measures to reduce or control environmental health hazards, if any:

**One of the overall goals of the Proposed Project is to reduce environmental health hazards from the CKD-affected groundwater. Carbon dioxide was chosen as the precipitating agent for arsenic in part because it presents few health hazards.**

**Health and safety plans will be prepared for use during construction of the groundwater remediation system. Worker and public safety protection**

measures will be performed during construction where workers may be exposed to CKD-affected water and where construction activities may disturb public areas (e.g., transportation on public streets).

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

**Existing sources of noise or disturbance that occur in the vicinity of the project will not affect the construction or operation of the Proposed Project.**

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

**Noise levels during construction will be those commonly associated with heavy equipment operation. Once the groundwater remediation system is operational, the noise level will be minimal.**

3) Proposed measures to reduce or control noise impacts, if any:

**None necessary.**

8. Land and shoreline use

a. What is the current use of the site and adjacent properties?

**The site is currently used for maintenance of the Closed CKD Pile, and for maintenance and operation of a pilot Permeable Treatment Wall. In addition, a building at the site is rented for use as a mechanical repair shop. Adjacent properties have the following uses:**

- **South – Closed CKD Pile, then vacant forested land**
- **Southwest – Closed CKD Pile, then a quarry road for access to residences in the mountains and for accessing an existing quarry**
- **West - Town of Metaline Falls visitor center and residences**
- **Northwest - strip of land owned by the Town of Metaline Falls, not used**
- **North/northeast - Sullivan Creek**
- **Southeast/South - open area adjacent to Sullivan Creek that will be used by WDOT for State Route 31 expansion**

b. Has the site been used for agriculture? If so, describe.

**Not to our knowledge.**

- c. Describe any structures on the site.

**There is one structure on-site, a two-story building formerly used as a residence and currently used as a mechanical repair shop.**

- d. Will any structures be demolished? If so, what?

**No.**

- e. What is the current zoning classification of the site?

**The Proposed Project site is not zoned.**

- f. What is the current comprehensive plan designation of the site?

**Pend Oreille County has not adopted a comprehensive plan.**

- g. If applicable, what is the current shoreline master program designation of the site?

**Conservancy Environment.**

- h. Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.

**The location of the proposed FGT is adjacent to Sullivan Creek. The site contains a small (0.07 acre) degraded Category IV wetland (Figure 2). Areas within 200 feet of Sullivan Creek are within Shoreline Management Act jurisdiction. This reach of shoreline has been designated "Conservancy Environment" and Sullivan Creek is known to contain both state priority species and species listed under the federal ESA (bull trout).**

- i. Approximately how many people would reside or work in the completed project?

**No one would reside at the completed project. The remediation system will be monitored remotely, and workers (1-2 at a time) will be on-site only about an average of 4 to 10 hours per week.**

- j. Approximately how many people would the completed project displace?

**None.**

- k. Proposed measures to avoid or reduce displacement impacts, if any:

**Does not apply.**

- l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

**None required.**

9. Housing

**Does not apply.**

- a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

- b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

- c. Proposed measures to reduce or control housing impacts, if any:

10. Aesthetics

- a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

**The only proposed structural change will be an approximately 1,200 square foot expansion of the existing on-site building to house equipment used to operate the groundwater remediation system.**

- b. What views in the immediate vicinity would be altered or obstructed?

**None.**

- c. Proposed measures to reduce or control aesthetic impacts, if any:

**None required.**

11. Light and glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

**The Proposed Project will not require additional lighting. The Proposed Project will operate continuously.**

b. Could light or glare from the finished project be a safety hazard or interfere with views?

**No.**

c. What existing off-site sources of light or glare may affect your proposal?

**None.**

d. Proposed measures to reduce or control light and glare impacts, if any:

**None required.**

## 12. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?

**Fishing in Sullivan Creek.**

b. Would the proposed project displace any existing recreational uses? If so, describe.

**No.**

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

**None required.**

## 13. Historic and cultural preservation

a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.

**None known. . The existing on-site metal building does not appear eligible for listing on national or state registers.**

b. Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.

**None known to occur on or next to the Proposed Project site.**

c. Proposed measures to reduce or control impacts, if any:

**None required.**

#### 14. Transportation

a. Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.

**State Route 31 serves the Proposed Project site. No city streets will be used for access.**

b. Is site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?

**No.**

c. How many parking spaces would the completed project have? How many would the project eliminate?

**None.**

d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).

**No.**

e. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

**No.**

f. How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.

**No one will reside or be located at the completed project. The remediation system will be monitored remotely, and workers (1-2 at a time) will be on-site occasionally.**

g. Proposed measures to reduce or control transportation impacts, if any:



**None.**

15. Public services

a. Would the project result in an increased need for public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe.

**No.**

b. Proposed measures to reduce or control direct impacts on public services, if any.

**None.**

16. Utilities

a. Circle utilities currently available at the site: **electricity**, natural gas, **water**, refuse service, **telephone**, sanitary sewer, **septic system**, other.

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

**Does not apply. No additional utilities will be required and no changes in service for existing utilities are expected as a result of the proposed project.**

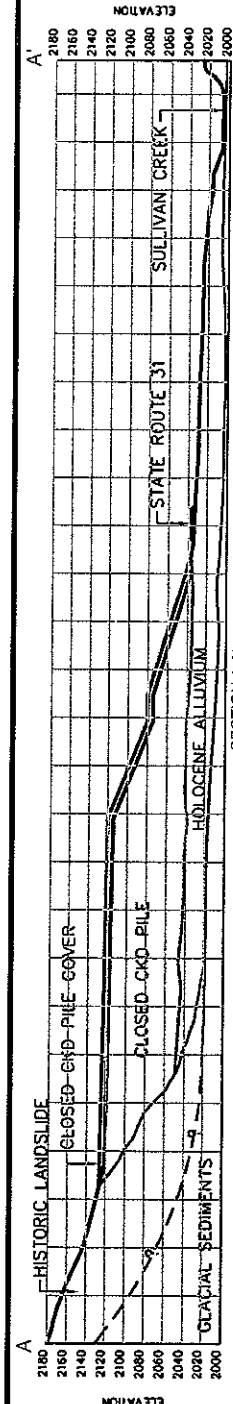
C. SIGNATURE

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

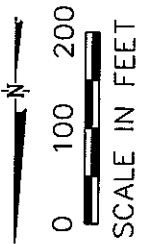
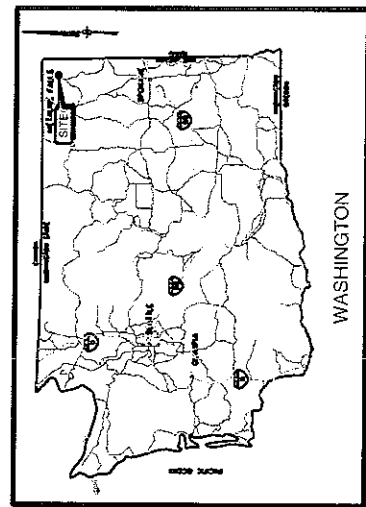
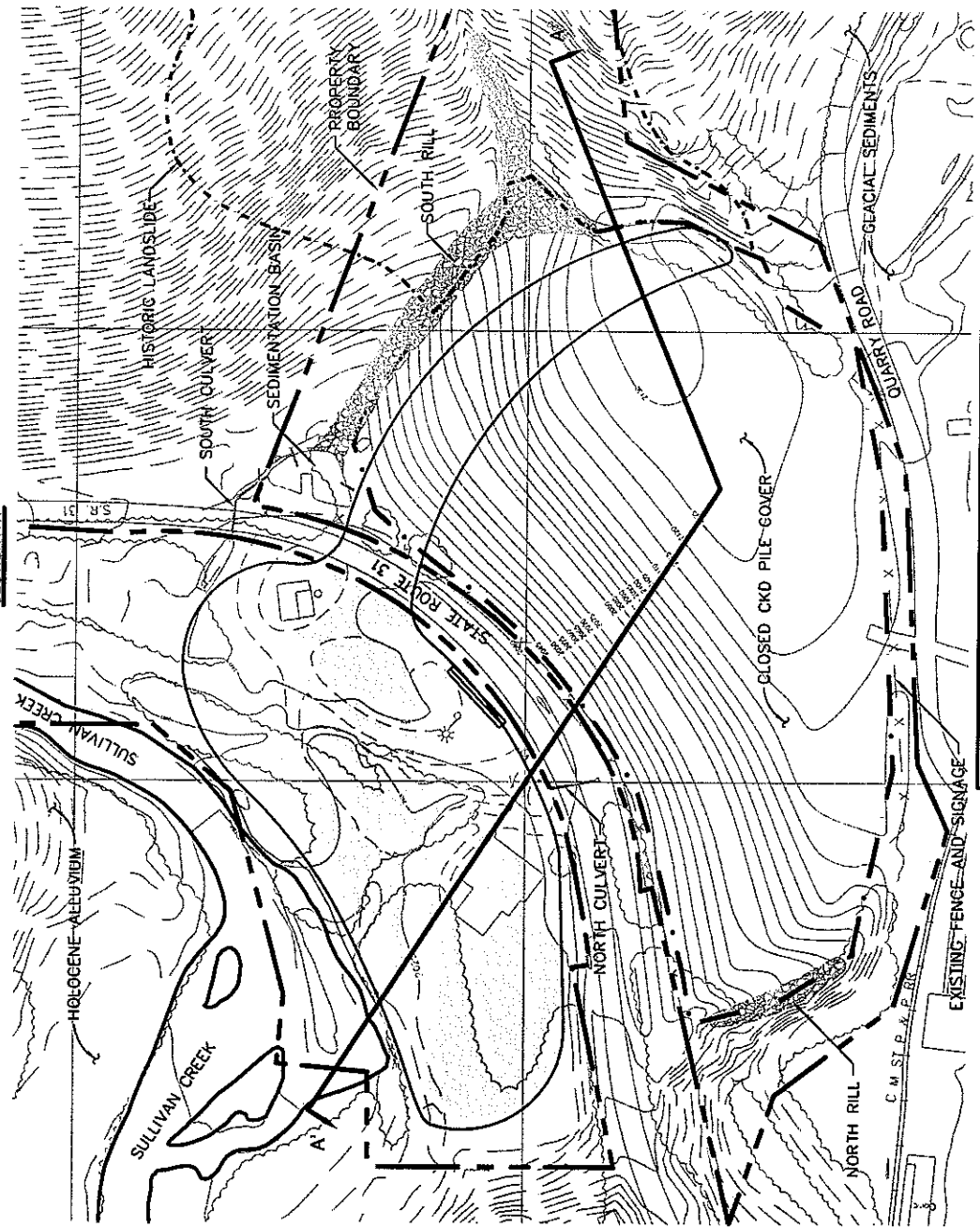
*Elizabeth H. Mikols*

Signature: Elizabeth H. Mikols  
Manager Public Affairs

Date Submitted: October 19, 2005

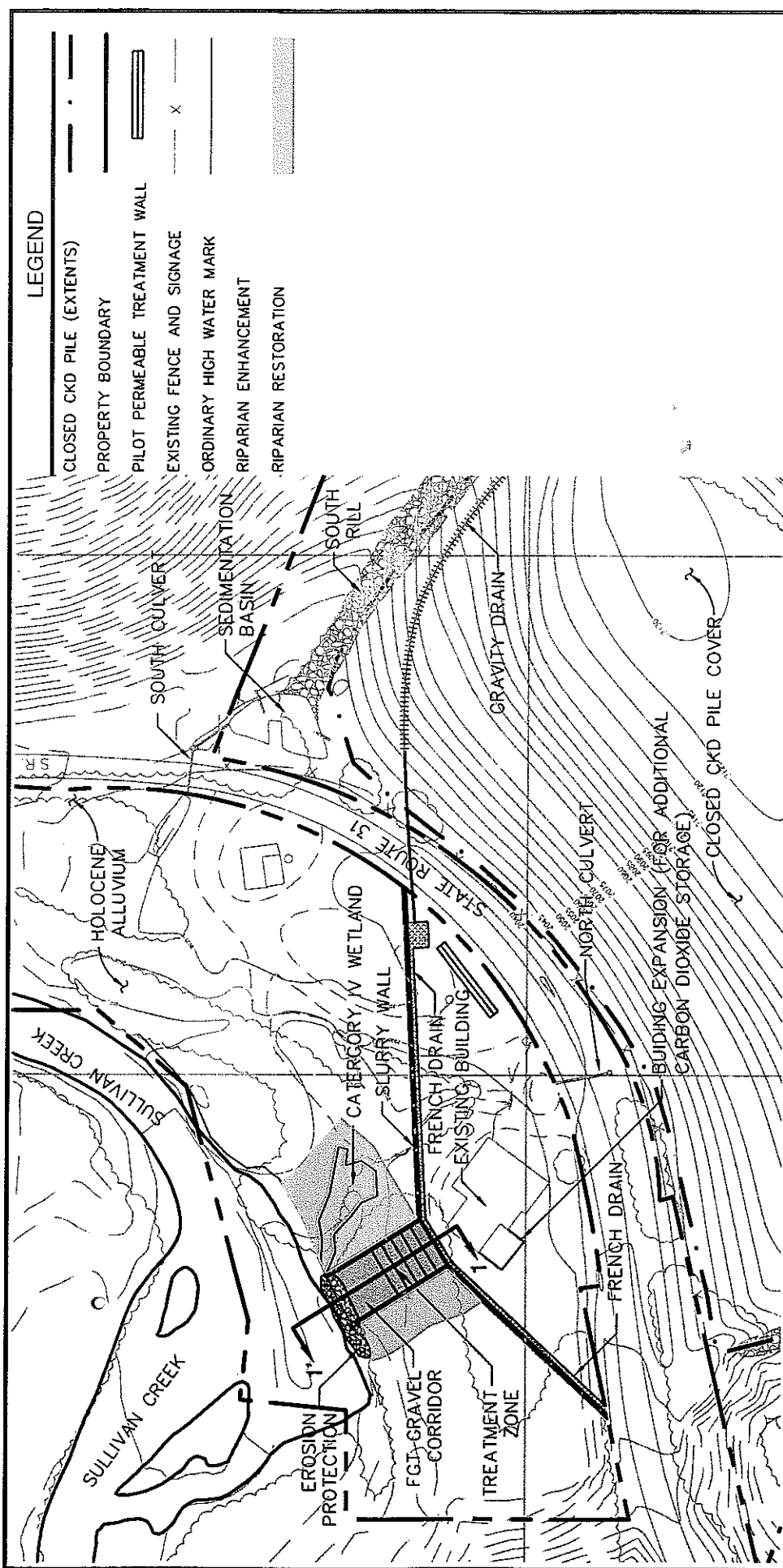


- LEGEND
- CLOSED CKD PILE (EXTENTS)
  - PILOT SYSTEM
  - EXISTING FENCE AND SIGNAGE
  - PROPERTY BOUNDARY
  - CONSTRUCTION AREA - PROPOSED MTCA GROUNDWATER REMEDIATION PROJECT
  - ORDINARY HIGH WATER MARK



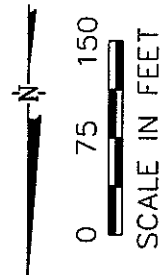
**GEOSYNTEC CONSULTANTS**  
SITE LOCATION AND CURRENT LAYOUT  
LEHIGH CEMENT COMPANY CLOSED CKD PILE  
METALINE FALLS, WASHINGTON

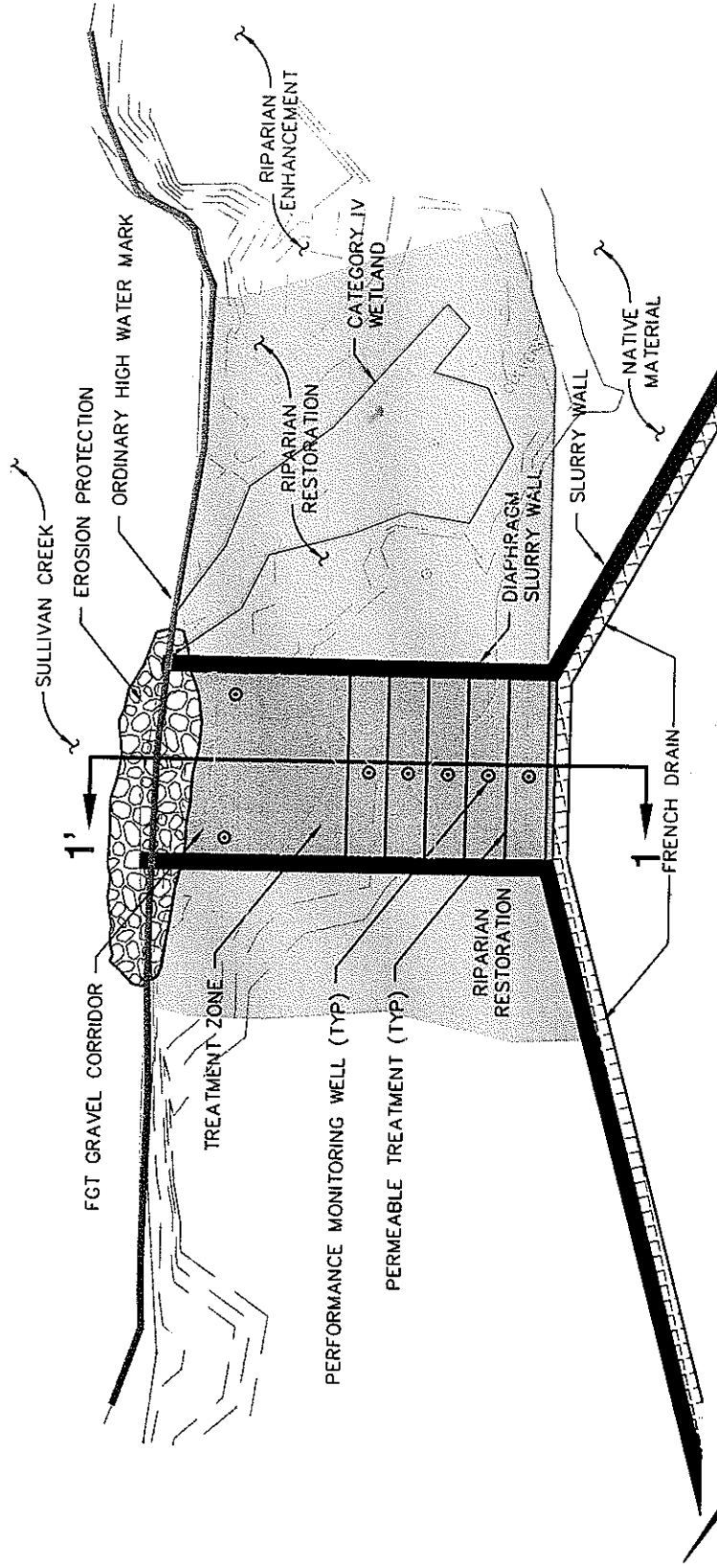
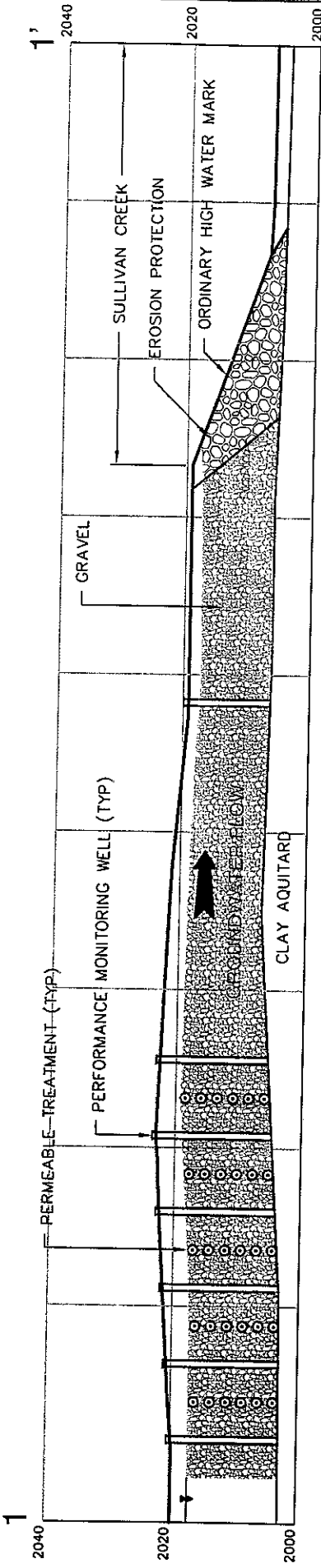
FIGURE NO. 1  
PROJECT NO. HR0196-12  
DATE: JULY 2005



NOTE: THE LAYOUT SHOWN ON THIS EXHIBIT IS PRELIMINARY. THE ACTUAL REMEDY LAYOUT, LOCATION, EXTENT, AND DESIGN DETAILS WILL BE PREPARED AND OUTLINED IN THE CLEAN-UP ACTION PLAN AND FINAL DESIGN DOCUMENTS. ACCORDINGLY, THE LOCATION, LAYOUT AND DETAILS OF REMEDY COMPONENTS AS SHOWN HERE MAY VARY.

<b>Geosyntec Consultants</b>	
PRELIMINARY PROPOSED CONSTRUCTION LAYOUT AND CROSS SECTION LOCATION MAP	FIGURE NO. 2
LEHIGH CEMENT COMPANY CLOSED CKD PILE	PROJECT NO. HR0196-12
METALINE FALLS, WASHINGTON	DATE: OCTOBER 2005





NOTE: THE LAYOUT SHOWN ON THIS EXHIBIT IS PRELIMINARY. THE ACTUAL REMEDY LAYOUT, LOCATION, EXTENT, AND DESIGN DETAILS WILL BE PREPARED AND OUTLINED IN THE CLEAN-UP ACTION PLAN AND FINAL DESIGN DOCUMENTS. ACCORDINGLY, THE LOCATION, LAYOUT AND DETAILS OF REMEDY COMPONENTS AS SHOWN HERE MAY VARY.

<b>GEO SYNTEC CONSULTANTS</b>	
PRELIMINARY DISCHARGE CORRIDOR DETAILS	
LEHIGH CEMENT COMPANY CLOSED CKD PILE	
METALINE FALLS, WASHINGTON	
FIGURE NO. 3	
PROJECT NO. HR0196-12	
DATE: OCTOBER 2005	