The State Environmental Policy Act (SEPA)
Environmental Checklist
For the
MTCA Landsburg Mine Site
Installation of Infrastructure Components of the
Contingent Groundwater Treatment System Project
Ravensdale, Washington

Submitted to:

The Landsburg Mine Site
PLP Group

Submitted by:

Golder Associates Inc.
18300 NE Union Hill Road, Suite 200
Redmond, Washington 98052

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1.0 INTRODUCTION

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. This checklist has been prepared based on the checklist (*indicated in italics below*) contained in WAC 197-11-960.

However, the reader must be aware that the proposed project is for components of remedial actions at the former Landsburg Mine site, a State of Washington Priority Listed site under the auspices of the Model Toxics Control Act (MTCA). Remedial actions at this site are intended to increase the protection of the environment and human health. The project described in this checklist will be implemented by the Landsburg Mine Site PLP Group under the oversight of the Washington Department of Ecology (Ecology) through an Agreed Order. Significant environmental information has previously been collected and reviewed as part of the multi-year Remedial Investigation and Feasibility Studies (RI/FS) (Golder, 1996). Additional associated engineering reports and studies are currently being prepared for the site. Consideration of environmental impacts including impacts to the local communities has been an integral part of the remedial investigation, remedial action selection, design and remedy implementation process.

1.1 BACKGROUND

The Landsburg Mine site consists of a former underground coal mine located approximately 1.5 miles northwest of Ravensdale in southeast King County, Washington. The site is located directly south and east of the S.E. Summit-Landsburg Road and north of the Kent-Kangley Road. The location of the site in the Seattle, Washington area is shown in Figure 1. Figures 2 and 3 depict the immediate site vicinity. The mine site occupies property owned by Palmer Coking Coal Company (PCC) and is located within sections 24 and 25, Township 22 N., Range 6 E.

PCC operated an underground coal mine known as the Landsburg Mine from the late 1940s until approximately 1975. The Rogers Seam, one of three seams mined at the site, was mined from 1959 until 1975. The mined section of the seam has a near vertical dip and consists of coal and interbedded shale approximately 16 ft wide. The mined section is about a mile in length. Mining occurred at depths of up to 750 feet using a mining method locally termed “booming” which followed the coal seam vertically. As a result of underground mining of the Rogers Seam, a subsidence trench developed on the land surface above the mine workings. The dimensions of the trench vary, from about 60 to 100 feet wide, between 20 to 60 feet in depth and about 3/4 mile in length.

A portion of the trench was used in the late 1960s to the late 1970s for disposal of various industrial wastes, construction materials, and land-clearing debris. Drums, liquid from tanker trucks and other industrial materials were disposed of in the northern portion of the trench. Disposal of land clearing debris continued until the early 1980s.

The Landsburg Mine Site PLP Group under the oversight of the Ecology conducted a Model Toxics Control Act (MTCA) Remedial Investigation (RI) to assess the nature and extent of chemical constituents in environmental media at the Landsburg Mine site. The MTCA Feasibility Study (FS) evaluated potential remedial alternatives that are appropriate for the site conditions. Although monitoring of groundwater that emanates from the site has not detected contamination above MTCA cleanup levels, the potential exists for groundwater quality in the future to change and contain waste constituents that were disposed in the Roger's Mine subsidence trenches.

1.2 PROPOSED PROJECT

This proposed project is to implement the installation of infrastructure components to the Contingent Groundwater Treatment System so that the system can become operational in a short time frame if contaminants are discovered to emanate from the mine through the groundwater pathway. The infrastructure components to the Contingent Groundwater Treatment System include: pad-mounted electrical transformer; concrete building pad; graveled vehicle drive and parking area; and a buried 6000 foot pipeline for treated groundwater effluent disposal to a sanitary treatment facility. The pipeline will connect to Soos Creek Water and Sewer District's sanitary sewer system that was installed as a dedicated sanitary sewer for the Tahoma Junior High School. The proposed pipeline connection to the existing Soos Creek sanitary sewer system will be dedicated for only use and conveyance of treated groundwater form the Landsburg Mine site. The proposed pipeline is explicitly not designed for commercial or residential developmental purposes, rather it is part of a MTCA cleanup action for protection of human health and the environment. This proposed project does not include the actual water treatment system, which will only be necessary if groundwater emanating from the site is found to be contaminated at the identified points of compliance in the Cleanup Action Plan and Ecology determines that groundwater capture and treatment is necessary.

2.0 THE STATE ENVIRONMENTAL POLICY ACT (SEPA) ENVIRONMENTAL CHECKLIST

A. BACKGROUND

1. Name of proposed project, if applicable:

Landsburg Mine Site MTCA Remediation Project

2. Name of applicant:

Landsburg Mine Site PLP Group

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

Landsburg Mine Site PLP Group Contact:

Douglas Morell of Golder Associates Inc. for the Landsburg Mine Site PLP Group. 18300 NE Union Hill Road Suite 200. Redmond, WA 98052-3333; (425) 883-0777; fax: (425) 882-5498.
e-mail: dmorell@golder.com

4. Date checklist prepared:

August 2005

5. Agency requesting checklist:

The Washington State, Department of Ecology (Ecology) is the lead agency providing oversight of the remediation of the Landsburg Mine MTCA site. Information concerning the Landsburg Mine site should be directed to the Ecology contact.

ECOLOGY Contact:

Dr. Jerome Cruz
Washington State, Department of Ecology
Northwest Regional Office
3190 160th Ave SE
Bellevue, WA 98008-5452
(425) 649-7200
fax: (425) 649-7098
e-mail: jcru461@ecy.wa.gov

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

The current schedule is to design and install the infrastructure components for the contingent groundwater treatment system by the end of 2005. Semi-annual groundwater monitoring results for the existing wells and newly installed deep Well LMW-11 are anticipated to also be received by the end of this year. Therefore, if Fall 2005 monitoring results indicate groundwater quality has changed and Ecology requires capture and treatment, the infrastructure will be in place. The treatment technology and treatment units will depend on the contaminants emanating from the mine waste materials and can be designed, ordered and installed in a relatively short time period.

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

The remediation program is currently proposed for only the infrastructure components of the contingent groundwater treatment system. During 2006 and subsequent years, the final remedial actions at the Landsburg Mine Site will be designed and implemented. The final remediation program will be determined in the Final Cleanup Action Plan (CAP), but is currently anticipated to be completed in two primary phases. The first phase would consist of the excavation of remnant coal mine waste rock and shale, haulage and backfilling the former Landsburg Mine subsidence trench in the areas in which the industrial wastes were disposed. A limited second phase will be required for final grading of a low permeability soil cap and surface water/stormwater diversion around the mine trenches. Routine maintenance and compliance monitoring will be performed at the site for as long as MTCA cleanup or remediation levels are exceeded.

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

A significant amount of environmental information has been generated and prepared for the Landsburg Mine Site. A Bibliography is attached to this report that provides a list of environmental related reports that have been prepared during the multi-year investigative and remedial design phases of the MTCA project. Several significant sources of information the reader is referred to are: the Remedial Investigation/ Feasibility Study (RI/FS) for the Landsburg Mine site (Golder, 1996), the Draft Cleanup Action Plan (DCAP) for the Landsburg Mine Site (Golder, 2002a) and the Compliance Monitoring Plan for the Landsburg Mine Site (Golder, 2002b).

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.

No other proposals are currently known to be pending for proposals affecting the Project Site covered by the MTCA remediation program at the Landsburg Mine Site.

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

Ecology is providing oversight of the MTCA Landsburg Mine project. MTCA is the key governmental regulation governing the conduct of the overall investigation and cleanup process for the site. MTCA describes the requirements for selecting cleanup actions, preferred technologies, policies for use of permanent solutions, the time frame for cleanup, and the process for making decisions.

Recent amendments to MTCA (RCW 70.105D.090) exempt remedial actions conducted pursuant to an Agreed Order or a Consent Decree from the procedural requirements of several state laws. These include the State Clean Air Act (RCW 70.94), Solid Waste Management - Reduction and Recycling Act (RCW 70.95), Hazardous Waste Management Act (RCW 70.105), Water Pollution Control Law (RCW 90.48), Shoreline Management Act (RCW 90.58), and Construction Projects in State Waters (RCW 75.20). In addition, the exemption also applies to the procedural requirements of any laws requiring or authorizing local governmental permits or approval for the remedial action. Therefore, while substantive compliance is necessary, permits and approvals are not required for remedial actions at the site.

SEPA is applicable to remedial actions at the Landsburg Mine site. Ecology is the lead agency for MTCA remedial actions performed under a Consent Decree or an Agreed Order pursuant to WAC 197-11-253. The SEPA process is triggered when a governmental action is taken on a public or private proposal. According to WAC 197-11-784, a proposal includes both regulatory decisions of agencies and

actions proposed by applicants. If the proposal is not "exempt," Ecology requires the submission of a SEPA checklist which provides information regarding how the proposal will affect elements of the environment, such as air, water, etc. A public comment period is required for the SEPA determination. In order to expedite and streamline public input, the SEPA public comment period is combined with the comment period associated with Amendment # 2 of the existing MTCA Agreed Order.

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.)

Landsburg Mine Site Installation of Infrastructure Components for the Contingent Groundwater Treatment System

The Landsburg Mine Site PLP Group under the oversight of the Washington State Department of Ecology conducted a remedial investigation and feasibility study to assess the nature and extent of chemical constituents in environmental media at the Landsburg Mine site. The primary purpose of the remedial investigation was to identify the chemical compounds potentially posing a human or environmental health risk and/or which exceed potential regulatory criteria and which are the result of prior waste disposal activities at the mine site. The remedial investigation determined that the contamination at the site was confined to within the existing mine. No hazardous substances related to prior disposal activities at the Mine above MTCA levels were detected in soil outside of the trench, or in groundwater and surface waters emanating from the site. Currently, the site is secured by a fence and locked gate which encloses the northern portion of the trench where disposal occurred.

The feasibility study evaluated potential remedial alternatives that are appropriate for the site conditions. Although monitoring of groundwater that emanates from the site has not detected contamination from disposed waste above MTCA cleanup levels, the potential exists for groundwater quality in the future to change and contain concentrations of waste constituents above MTCA levels. All remedial alternatives include the requirement for a contingent groundwater capture and treatment system in case groundwater quality changes in the future and Ecology determines that unacceptable levels of contaminants are present at the identified points of compliance in the Cleanup Action Plan.

This proposed project is to construct and install the infrastructure components of the Contingent Groundwater Treatment System, but does not include the actual treatment system. The infrastructure components of this proposed project are expected to require a relatively long time to get installed compared to the treatment modules. Hence, the purpose of this proposed project is to install the infrastructure components of the contingent groundwater treatment system to be able to implement groundwater capture and treatment in a short time frame in the event that groundwater quality changes and Ecology determines that groundwater capture and treatment is necessary. This groundwater capture and treatment system will keep contamination, if any, from the Mine site from reaching the accessible environment and provide protection to human health and the environment. If groundwater capture and treatment becomes necessary in the future, the treatment system will be specific to the contamination and should be available in a relatively short time frame for installation and operation.

This project includes the installation of the infrastructure components for the contingent treatment system. These components include: electrical transformer with necessary electrical cables/poles; concrete building pad; vehicle drive and parking area; and a 6000 foot pipeline for treated groundwater disposal to a sanitary treatment facility. The pipeline will connect to Soos Creek Water and Sewer District's sanitary sewer system that was installed as a dedicated sanitary sewer for the Tahoma Junior High School. The proposed pipeline connection to the existing Soos Creek sanitary sewer system will be dedicated for only use and conveyance of treated groundwater form the Landsburg Mine site. The proposed pipeline is

explicitly not designed for commercial or residential developmental purposes, rather it is part of a MTCA cleanup action for protection of human health and the environment.

This project does not include the actual treatment unit because the contaminants, if any, that may emanate from the mine waste are not known. The entire groundwater treatment system cannot be built at this time, since groundwater contamination from disposed waste in the Mine has not been found to be emanating from the site and the treatment system must be designed for specific contaminants. If contaminants are found to be emanating from the mine and Ecology determines that groundwater capture and treatment is necessary, the treatment technology and treatment units will be designed, ordered and installed for these specific types of contaminants. The treated water will be discharged to the Soos Creek sanitary sewer and will meet King County wastewater discharge limitations. The time to design and order the appropriate treatment units is anticipated to be relatively short, if the infrastructure components are already in place.

Therefore, this SEPA checklist addresses only the design and installation of infrastructure components of the contingent groundwater treatment system. These partial remedial actions that are proposed in this SEPA Checklist are more completely defined in the Scope-of-Work to the Amendment #2 of the existing MTCA Agreed Order. Before the cleanup action is implemented, a Draft Cleanup Action Plan (DCAP) will be issued for public review and comment, along with SEPA analysis of the cleanup action. Ecology is the lead agency and will provide oversight of the remediation program and long-term compliance-monitoring program for the life of the MTCA Landsburg Mine Site.

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 Landsburg Mine site consists of a former underground coal mine located approximately 1.5 miles northwest of Ravensdale in a rural area of southeast King County, Washington. The site is situated directly south and east of the S.E. Summit-Landsburg Road and north of the Kent-Kangley Rd (State Highway 516). Downtown Seattle is approximately 20 miles to the northwest. The Cedar River passes within approximately 500 ft of the site to the north. The location of the site is shown in Figures 1, 2 and 3. The topography of the site and general site features are depicted in Figure 3.
The mine site occupies property owned by Palmer Coking Coal Company (PCC) and is located within sections 24 and 25, Township 22 N., Range 6 E. The site is located in the northwest corner of the Cumberland 7.5 minute quadrangle along the boundary with the Hobart quadrangle. The *Landsburg Mine site* was defined in the Work Plan (Golder 1992a) and RI/FS (Golder 1996).

The proposed project at the Landsburg Mine site involves the design, construction and installation of infrastructure components for the Contingent Groundwater Treatment System. Figures 4, 5 and 6 show the location and layout of the proposed project. The infrastructure components that will be designed, constructed and installed includes: a concrete pad for the treatment system, an electrical transformer for electric power for the treatment system, access entrance and road, a parking area and a 6000 foot long effluent pipeline from the concrete pad to the sanitary sewer connection in front of the Tahoma Junior High School. The only portion of the project that will be constructed and installed outside of Palmer Coking Coal property will be an 800 foot portion of the effluent pipeline that will run along S.E. Summit-Landsburg Road in front of the school.

The effluent discharge pipeline from the treatment system will extend about 5200 feet along Palmer Coking Coal property (mostly underneath existing gravel roads) to the S.E. Summit-Landsburg Road

across from the Tahoma Junior High School. The effluent discharge pipeline will then follow the S.E. Summit-Landsburg Road for about 800 feet in a westerly direction within its right-of-way and cross under the S.E. Summit-Landsburg Road for connecting to the dedicated sanitary sewer system that is operated by Soos Creek Water and Sewer District.

Apart from the Mine, the only development in the Landsburg Mine area is the Tahoma Junior High School and residential dwellings with approximately 90 residences. The school is located about 0.65 miles northwest of the mine site. The nearest residences to the site are to the southwest approximately 800 ft from the trench. Drinking water for area residences is supplied by groundwater, either through private wells or small community water supply systems. Domestic sewage disposal throughout the Study Area is by residential septic systems.

The access road begins near S.E. Summit-Landsburg Road and follows along the northern portion of the trench. A locked gate secures the site at the access road entrance, and the portion of the trench where disposal occurred is currently enclosed by a 6 ft tall chain link security fence. A gravel road services logging practices on the Palmer Coking Coal property and connects with the S.E. Summit-Landsburg Road at two locations west of the north Mine entrance. Dense vegetation covers the remaining site and includes blackberry, alder, cedar, hemlock, cottonwood, maple, but is primarily Douglas fir.

Approximately 3/4 mile upstream of the north site entrance (near Portal No. 2), the City of Seattle Water Department maintains a drinking water supply intake known as the Landsburg Diversion within the Cedar River at Landsburg. Water is conveyed from the intake through a 96-in diameter pipeline to the Lake Youngs Reservoir, located some 5 miles to the northwest of Landsburg. The pipeline passes just to the north of the site and is located near the bottom of the slope between the S.E. Summit-Landsburg Rd. and the Cedar River. An unpaved service road (Pipeline Road) parallels the pipeline right-of-way. A meteorologic data collection and river gauging station, operated by the City of Seattle, are located at the water intake structure. The location of the supply intake is shown in Figure 2. Approximately 1 mile upstream from the Landsburg Diversion on the Cedar River, a river gauging station is maintained by the USGS (Landsburg Gauging Station).

Near the south end of the Mine, electrical transmission lines and a Bonneville Power Administration property easement cross the site in an east-west direction. The City of Kent Clark Springs Facility is located approximately a 1/2 mile to the southwest of the south Portal (Portal No. 3) of the Landsburg Mine. The Clark Springs Facility was built in the 1940s and consists of a lateral gravity drainage collection system installed approximately 13 to 15 ft. below ground surface (bgs) in the Rock Creek alluvium.

B. ENVIRONMENTAL ELEMENTS

1. Earth

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

The Landsburg Mine property sits atop a gently sloping hill which reaches a maximum elevation of approximately 800 feet above mean sea level (amsl) near the central portion of the site. At the site's northern end (Figure 3), this hill slopes steeply downwards towards the S.E. Summit-Landsburg Rd. (elevation of approximately 615 ft. amsl) and continuing to the Cedar River (elevation approximately 500 ft. amsl). The southern portion of the site slopes more gradually downwards to the south toward the Kent-Kangley Rd. and Rock Creek drainage located at an elevation of approximately 600 ft. amsl. The site is bounded to the east by a somewhat larger hill which rises to a maximum elevation of approximately 940 ft. amsl.

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

Slopes range from vertical in the side walls of the subsidence trench to very gently sloping at the base of the hill in the northern portion of the property. Geotechnical engineering evaluations of the slopes and subsidence trench stability have been considered in the design of the proposed project.

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.

The soils at the site are derived from glacial drift materials primarily consisting of till and recessional outwash. The till which mantles the hills in the project site area consists of a compact mixture of gravel and occasional boulders in a clayey, silty sand matrix. Isolated swamp deposits consisting of peat and lacustrine deposits are scattered around the perimeter of the study area but do not occur in the specific remediation project site. No prime farmland will be affected by the proposed project. A 1972 soil survey by the U.S. Department of Agriculture lists the soils on site as Everett and Alderwood.

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

Coal extraction in this near vertical coal seam (Rogers), and associated caving at the outcrop, has produced intermittent subsidence trenches up to 100 feet wide and 70 feet deep. The walls of the trench are typically steep sided and composed of massive sandstone. However, in the specific installation areas of the proposed infrastructure components for the contingent groundwater treatment system, there are no observed or known unstable soils. The materials are typically dense glacial till overlying bedrock composed of sandstones, siltstones and shales. Geotechnical engineering evaluations of the slopes in the area have been considered in the design of this proposed project.

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

The proposed project at the Landsburg Mine site involves the construction and installation of infrastructure components for the Contingent Groundwater Treatment System. The infrastructure components that will be constructed and installed includes: a concrete pad for the treatment system, an electrical transformer for electric power fro the treatment system, access entrance and road, a parking area and a mile long pipeline from the concrete pad to the sanitary sewer connection in front of the school. Grading for the concrete pad will be minimal, since the ground surface at the location is flat. Some subgrade material (sand) will be imported as a base for the concrete pad from an approved commercial source. The entire effluent pipeline will be about 6000 feet in length. Fifty two hundred (5200) feet of the dedicated pipeline will be within private property and will be buried about 3.5 feet below the ground in a trench. About 800 feet of the buried pipeline will be along King County right-of-way on S.E. Summit-Landsburg Road. This 800 foot section will be constructed in accordance with King County specifications for a pipeline connection to a sanitary sewer system and the excavated trench soils will be used as backfill. The connection to the sanitary sewer will require crossing the Landsburg-Summit Road adjacent to the Tahoma Junior High School on level ground.

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

Engineering and operational practices will be utilized to minimize the impacts of the limited erosion that will occur during the actual construction of the infrastructure components of the contingent groundwater treatment system. The construction of the treatment system concrete pad, electrical transformer, vehicle drive and parking area will occur on cleared ground on the north end of the mine site. Forty two hundred (4200) feet of the underground effluent discharge pipeline will be buried beneath existing gravel roadways on the Palmer Coking Coal property. The pipeline will be buried 3.5 feet below the ground on Palmer Coking Coal property.

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

The electrical transformer and concrete pad for the treatment system will cover about 7500 square feet in total. The vehicle drive and parking area will have a gravel surface and the effluent pipeline will be buried underground.

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

Water runoff and erosion control is a primary engineering design element in the construction of the proposed project. The pipeline will be installed within an excavated trench of about 3.5 feet deep. The discharge pipeline will conform to the engineering requirements of King County for connecting to a sanitary sewer system and for pipelines running along and crossing under a roadway. All water entering the trench will remain in the trench and allowed to infiltrate. In accordance with King County requirements, trenches will be appropriately stabilized along roadways and standard BMPs using silt fences and hay bales will be used for each drainage connecting to the excavated trench. Earthwork and diversion structures will be used to divert surface water runoff away from the pipeline trench. Water control structures, ditches and piping may be used to control surface water and allow infiltration with minimal erosion. Routine periodic maintenance and monitoring will be performed looking for signs of erosion. Corrective actions will be quickly implemented to prevent further erosion. Specific surface water flow design drawings are being prepared as part of the engineering design reports for this proposed project.

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.

Short-term fugitive dust emissions to the air may result during the construction activities during grading and trenching activities. These emissions would be from uncontaminated materials and would be similar to those associated with any small grading / trenching project. Standard engineering and operational practices will be used to control fugitive dust from grading, excavation and hauling activities such as frequent and regular watering to keep soil moisture at a level that controls fugitive dust emissions to below observable levels.

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

There are no off-site sources of emissions or odor that would affect the remediation project at the former Landsburg Mine site.

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

Standard engineering and operational practices such as frequent and regular watering will be used to control fugitive dust from source material, excavation, and hauling activities. The amount of watering will not create water runoff, but will be sufficient to eliminate visible fugitive dust.

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.

The major surface water features in the Study Area are the Cedar River along the Study Area's northern boundary and Rock Creek along the southern boundary. The proposed project is situated along the Cedar River drainage. In addition to these major features, the site itself contains a number of small minor unnamed and primarily ephemeral drainages and shallow depressions. However, no surface water from the mine site directly flows into either the Cedar River or Rock Creek. These features of the Study Area are discussed below. Figure 7 depicts the primary surface water flow pattern and surface water features of the Study Area.

Cedar River

The major surface water in the Study Area vicinity is the Cedar River which is located approximately 500 ft from the northern end of the trench. The Cedar River valley drainage system extends from the crest of the Cascade Range to the south end of Lake Washington.. Major features of the system include Lake Washington, the Rock Creek tributary (City of Kent Clark Springs Facility), and the City of Seattle water intake structure at Landsburg.

The largest lake in the system is Lake Washington which is presently the endpoint for water flowing westward from the Cedar River. The Cedar River supplies approximately 54% of Lake Washington's

supply. The river is considered a significant regional water supply providing 70% of the water needs for the City of Seattle and surrounding areas.

The Cedar River is classified as A (excellent) quality from Lake Washington to the State Highway 169 overpass in Renton, Washington. Nearer to the Landsburg Mine site, the river has been rated AA (extraordinary) which is described as "markedly and uniformly exceeding the requirements for all or substantially all beneficial uses." Water quality in the Cedar River mainstem is considered excellent.

Flow data for the river are available for two gauging stations located in the Study Area vicinity. The USGS maintains a gauging station approximately 1 mile upriver of the diversion. Data for this station are available for the period 1895 to 1994. Below the diversion structure, a gauging station is operated by the City of Seattle. Above the diversion structure, the daily average flow varies from a low of approximately 322 cubic feet per second (cfs) in September to a maximum of about 975 cfs in January. A long, relatively wet season is indicated from November through June where average daily flows vary between approximately 700 and 975 cfs. The dry season is July to September with average daily flows of about 300 to 500 cfs. Below the diversion, data compiled from 1992 to 1994 indicate the daily average flow in the river varies from a high of only 591 cfs in December to a low of 160 cfs in September. The difference between daily average flows at the two gauging points is generally in the 150 to 450 cfs range. This presumably represents the approximate diversion taking place at the City of Seattle diversion structure.

Rock Creek

Rock Creek is located in the southern portion of the site and is tributary to the Cedar River. The creek represents the only perennial creek or stream within the Study Area boundaries. The creek becomes ephemeral in the south-central portion of the Study Area approximately where it crosses under the Kent-Kangley Road. (Figure 7). The relatively high flow rate which is generated within several hundred feet of this point indicates the creek is gaining in the portion located within the Study Area (i.e. sustained by groundwater discharge). Presumably the source of flow in the creek is groundwater inflow from the east through the permeable glacial outwash deposits.

The Rock Creek sub-basin drains over 7,000 acres and is one of the five major tributary subbasins of the Cedar River. Flow data for Rock Creek near the City of Kent diversion was available for the years 1945 through 1948. The average daily flow for this time was 29 cfs. Daily averages for the creek over this period varied from a minimum of 6.3 cfs in August to 56 cfs in December.

Rock Creek has been diverted by the City of Kent since the early 1900s for use as a municipal water source. The diversion by the City of Kent represents approximately 26% of the mean annual flow of the Creek and the majority of the creek's flow during the low-flow months of September and October. The existing diversion structure, referred to as the Clark Springs Facility, was built in the 1940s and consists of a lateral gravity drainage collection system installed 13 to 15 ft. below ground surface in the Rock Creek alluvium.

Site Drainage Features

The mine site itself has only ephemeral drainages which discharge during prolonged or intense periods of rainfall. The southern portion of the mine site drains towards Rock Creek and the northern half drains to the Cedar River. The generalized surface water flow patterns at the site and the locations of major features are shown in Figure 7.

The lower elevations around the perimeter of the Study Area are covered by relatively permeable outwash sands and gravels at the land surface without defined drainage patterns. Rainfall is expected to readily infiltrate these materials. The elevated portions of the site either have surface outcrops of bedrock or a thin veneer of glacial drift (till) which will inhibit infiltration relative to the permeable outwash deposits. In general then, surface water flow at the site is expected to run-off the hills, collect in ephemeral drainages and flow to the lower elevations where it infiltrates into the outwash deposits and drains towards Rock Creek or the Cedar River. Some run-off also flows into the mine trench, depending on the local topography and drainage patterns. Run-off flowing into the mine trench collects in several ephemeral pools where it infiltrates or evaporates.

Field reconnaissance by Golder Associates personnel confirmed six wet areas within the trench or immediate vicinity (Figure 7). Two of these consist of the mine portals #2 and #3. Water occurrence at these locations is perennial and is expected to represent natural groundwater discharge. Another, the so-called "sludge pond" (area #5) located just to the north of well LMW-1, is also perennial. The other four areas consist of localized pools which are ephemeral and have been observed to go dry during the months of June through November. These pools are not believed to represent groundwater, but rather are more accurately characterized as ephemeral pools of surface run-off which flows into the trench due to local topography and is then temporarily retained.

The water present at the north portal #2 occurs as a pool that is completely retained and enclosed as a shallow depression. Drainage from portal #2 at the north end of the mine was reported during earlier investigations by Ecology and Environment in February 1991, but was not observed by Golder Associates at any time during the RI. Portal #3 occurs as seepage where water emanates along a sloping seepage face, flows along the ground surface for a short distance, and gradually re-infiltrates back into surficial soils. Surface water run-off from portal #3 was never observed to extend beyond the Kent-Kangley Rd. Flow rates measured at the portal during this RI varied from about 2 gpm to 100 gpm with the minimum flow occurring in late summer and the maximum flow occurring in winter.

Other localized pools or shallow ponds also occur in the Study Area. These are shown in Figure 7. One is located along the southwest side of the hill located to the east of the trench. This pond is perennial and is located along one of the major ephemeral drainages at the site. Discharge from the pond occurs through a culvert which passes beneath the adjacent dirt road. Discharge through the culvert apparently ceases during the summer months. Two other shallow ponds, which are also associated with the major ephemeral drainages at the site are present along the north side of this hill. Miscellaneous occurrences of standing water at the higher elevations are common in the wetter months.

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.*

The proposed project will not require any work over, in or adjacent to (within 200 feet of) Cedar River or Rock Creek.