May 3, 1999

Mr. David Bennett
Task Monitor
United States Environmental Protection Agency
1200 Sixth Avenue, ECL-115
Seattle, WA 98101

Re: Contract No. 68-W6-0008, Technical Direction Document No. 98-06-0002
Red Rock Road - Sutherlin, Preliminary Assessment

Dear Mr. Bennett:

Enclosed please find the Preliminary Assessment (PA) report completed for the Red Rock Road site located in Sutherlin, Oregon.

This Technical Direction Document will remain open to address comments to this report. If you have any questions regarding this PA, please call me at (206) 624-9537.

Sincerely,

ECOLOGY AND ENVIRONMENT, INC.

Linda Foster
START Project Leader

cc: Gary Sink, START Project Officer, EPA, Region 10, Seattle, WA (letter only)
David Byers, START Program Manager E & E, Seattle, WA (letter only)
Charles Gregory, START Project Manager, E & E Seattle, WA

Red Rock Road Site
Preliminary Assessment
Sutherlin, Oregon

TDD: 98-06-0002

Contract: 68-W6-0008
May 1999

Region X

START

Superfund Technical Assessment and Response Team

Submitted To: David Bennett, Task Monitor
U.S. Environmental Protection Agency
1200 Sixth Avenue
Seattle, WA 98101

RED ROCK ROAD SITE
PRELIMINARY ASSESSMENT REPORT
SUTHERLIN, OREGON

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LIST OF ACRONYMS

Acronym	Definition
bgs	below ground surface
cfs	cubic feet per second
CNR	Conser-Newburg-Roseburg
E & E	Ecology and Environment, Inc.
ECSI	Environmental Cleanup Site Information
EPA	U.S. Environmental Protection Agency
FEMA	Federal Emergency Management Administration
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
ODEQ	Oregon Department of Environmental Quality
ONHP	Oregon Natural Heritage Program
OWRD	Oregon Water Resources Department
PA	Preliminary Assessment
PPE	probable point of entry
ppm	parts per million
START	Superfund Technical Assessment and Response Team
TDD	Technical Direction Document
TDL	target distance limit
USDC	U.S. Department of Commerce
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
WRCC	Western Regional Climate Center

RED ROCK ROAD SITE
PRELIMINARY ASSESSMENT REPORT
SUTHERLIN, OREGON

1. INTRODUCTION

Ecology and Environment, Inc., (E & E) has been tasked by the U.S. Environmental Protection Agency (EPA) to provide technical support for completion of a Preliminary Assessment (PA) at the Red Rock Road site in Sutherlin, Oregon. E & E completed PA activities under Technical Direction Document (TDD) No. 98-06-0002, issued under EPA Region 10 Superfund Technical Assessment and Response Team (START) Contract Number 68-W6-0008. The specific goals for the Red Rock Road site identified by EPA are as follows:

- Determine the potential threat to public health or the environment posed by the site;
- Determine the potential for a release of hazardous constituents into the environment; and
- Determine the potential for placement of the site on the National Priorities List.

Completion of the PA included reviewing existing site information, collecting receptor information within the site's range of influence, determining regional characteristics, and conducting a site visit. This document includes a discussion of site background information (Section 2), a discussion of migration/exposure pathways and potential receptors (Section 3), and a list of pertinent references (Section 4).

2. SITE BACKGROUND

2.1 SITE LOCATION

Site Name: Red Rock Road - Sutherlin

CERCLIS ID No.: OR0002367191

Location: Red Rock Road
Sutherlin, Oregon 97479

	Eastern End of Road	*Western End of Road*
Latitude/	43° 28' 19" North	43° 23' 18" North
Longitude:	123° 3' 34" West	123° 18' 5" West

Legal Description: The site is located within the following townships, ranges, and sections:

Township	Range	Sections
25S	5W	12, 13, 15, 40, 41, 50, 51
25S	4W	1, 2, 9, 10, 11, 37, 38, 41, 47, 49, 51
25S	3W	6
24S	3W	20, 21, 29, 31, 32

Site Owners: Weyerhaeuser, Inc.
33663 Weyerhaeuser Way South
Federal Way, WA 98003
(206) 924-3772

City of Sutherlin
P.O. Box 459
Sutherlin, OR 97479

Site Contacts: Jim Odendahl
Director of Corporate Remediation
Weyerhaeuser, CH1L28
Tacoma, WA 98477

Richard Schwartz
City of Sutherlin
P.O. Box 459
Sutherlin, OR 97479

2.2 SITE DESCRIPTION/OWNERSHIP HISTORY

Red Rock Road (also referred to as the "railroad grade" throughout the report) is an abandoned railroad grade approximately 17 miles long located in Douglas County, Oregon (Figure 2-1). The railroad grade was constructed with mine tailings from a nearby mercury mine. The western end of the abandoned railroad grade is located within the city limits of Sutherlin, Oregon. To the east, the road roughly follows Sutherlin Creek, the Platt I Reservoir, Campas Swale, and Calapooya Creek, until it reaches its eastern end along Calapooya Creek, near Brown Mountain (Figure 2-2). The road also passes through the communities of Nonpareil and Hawthorne (United States Geological Survey [USGS] 1988). The railroad grade and the associated railroad were constructed for and owned by Weyerhaeuser, Inc. until 1966 when they began to sell segments of the road to various parties; 33 segments of the road have been sold. Currently, Weyerhaeuser owns 5.6 acres of the original railroad grade (Pistoresi 1996a, 1996b).

Generally, the railroad grade is not fenced and is primarily level or gently sloping in some areas. Red Rock Road is surrounded by residential properties within the Sutherlin city limits. Outside of the city limits, the surrounding land is used for livestock pasture, residences, or undeveloped property consisting of meadows and forests.

2.3 SITE OPERATIONS AND WASTE CHARACTERISTICS

The railroad was originally constructed and used by Weyerhaeuser to transport logs until 1966. The rails and ties of the original railroad track have since been removed. Reportedly, the railroad grade was constructed of red fill material consisting of cinnabar mine tailings from the former Bonanza Mercury Mine, located approximately 0.75 miles south of the site near Nonpareil, Oregon (Oregon Department of Environmental Quality [ODEQ] 1997). The mine tailings allegedly used to construct the railroad grade are considered a potential source of heavy metal contamination along the entire length of the grade. Contaminants generally associated with cinnabar mine tailings include mercury, arsenic, barium, cadmium and lead. The primary contaminant of concern is mercury. No records were available in the site file to document the actual volume of material used to construct the railroad grade. Based on a 14-foot-wide by 17-mile-long railroad grade, the overall area of the source is estimated to be approximately 1,260,000 square feet. The source volume, based on the same length and width, an average bed depth of 5 feet, and side slopes at a 1:1 ratio, has been calculated to be approximately 316,000 cubic yards.

The only portion of Red Rock Road known to be paved is a section approximately 690 feet long within the City of Sutherlin. The remainder of the railroad grade is expected to be unpaved and, in most locations, the fill material exposed at the surface. However, in some areas the original railroad grade

material has been covered with newer gravel. One such area is in the vicinity of Hinkle Creek (see Appendix A, photograph No. 1-07). The City of Sutherlin plans to place a 4-inch-deep gravel cap on a 2,550-foot-long portion of the railroad grade within the city limits to comply with the ODEQ. The railroad grade is currently used as roadways, driveways, and cattle trails outside the city limits (Environmental Cleanup Site Information [ECSI] 1997). Within the city limits, one source reports that the railroad grade is used as a recreation trail (ECSI 1997), while another source reports no recreational trail on the railroad grade within the city limits (Gray 1999).

2.4 PREVIOUS INVESTIGATIONS

In December 1995, in response to a series of complaints and inquiries regarding the source of the fill material, ODEQ collected two surface soil samples from the railroad grade (ODEQ 1997). Both samples, each consisting of a composite of five aliquots, were collected approximately 100 yards east of State Street within the Sutherlin city limits (Figure 2-2). The sample aliquot locations were located 10 feet from each other. The soil samples were analyzed for Primary Pollutant Metals at the ODEQ laboratory (CH2M Hill 1996). Metals detected in the samples included mercury (52 and 56 parts per million [ppm]), barium (99 and 92 ppm), cadmium (both samples 2 ppm), chromium (110 and 100 ppm), cobalt (16 and 15 ppm), copper (both samples 150 ppm), nickel (93 and 88 ppm), vanadium (both samples 160 ppm), and zinc (both samples 120 ppm; (ODEQ 1997).

Weyerhaeuser Inc. has not conducted or is not aware of any environmental assessments or other investigations conducted on the 5.6 acres they own or on the parcels that have been sold (Pistoresi 1996a).

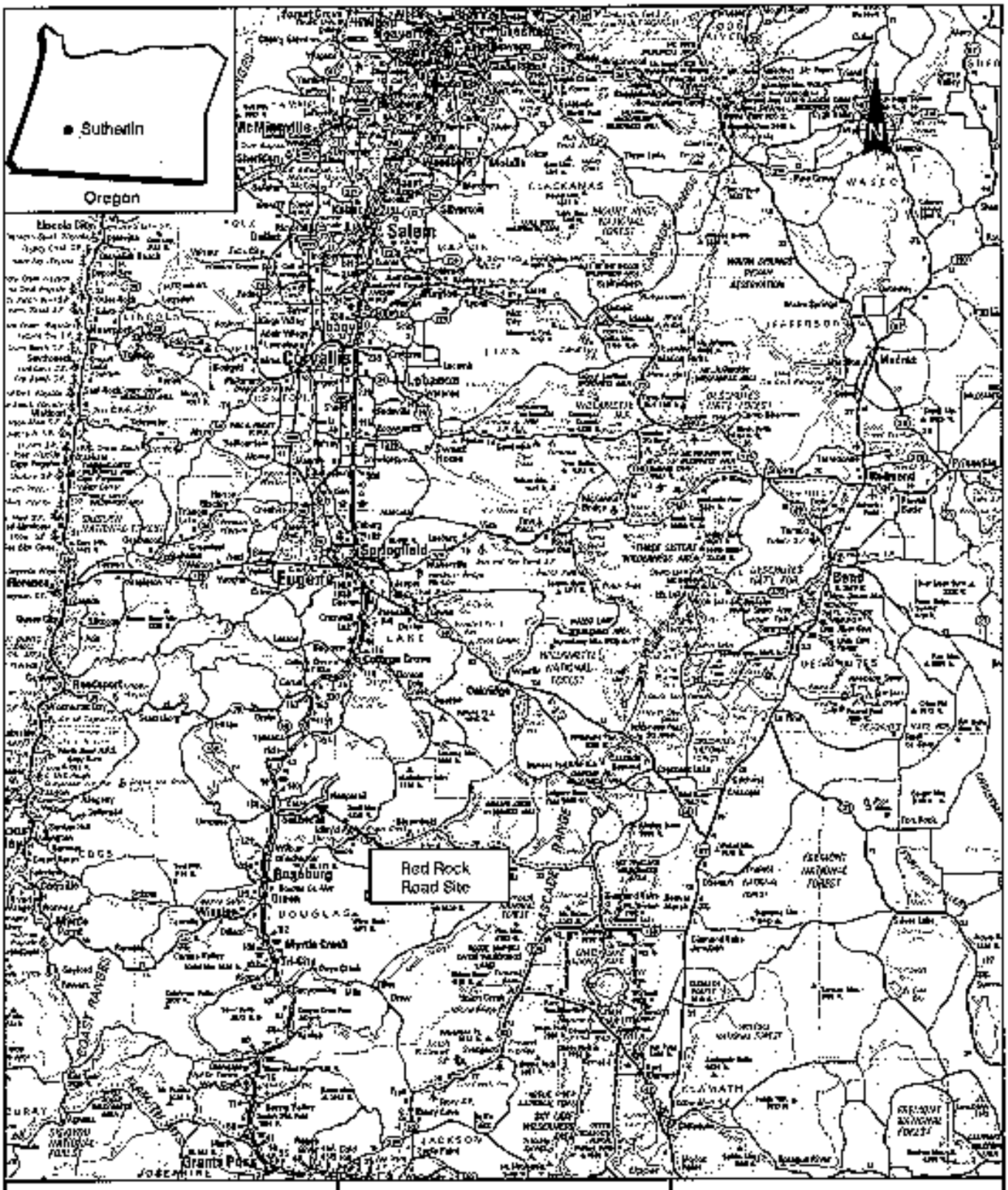
2.5 START ACTIONS

On December 11, 1998, the START conducted a site visit that included inspection of two of the main stream crossings (at Gassy Creek and Hinkle Creek), the Platt I Reservoir, and several areas adjacent to the railroad grade. At the Gassy Creek stream crossing, the START observed that the old railroad grade crosses the creek via a bridge (Appendix A, Photograph 1-01). In this area, the railroad grade passes through land used to raise commercial livestock. A portion of the railroad grade appears to be used by cattle (Appendix A, photographs 1-02 and 1-05). It is expected that fill material from the railroad grade may erode and migrate into the creek at this location.

The railroad grade also crosses over Hinkle Creek via a bridge (Appendix A, Photographs 1-08 and 1-11); erosion of the stream bank was observed to the southeast of the bridge. The eroding area is adjacent to and encroaching on the railroad bed material. Contamination from railroad bed material is potentially migrating into the creek at this location: however, this has not been confirmed.

During the site visit, the START observed that the railroad grade was not continuous in the vicinity of Platt I reservoir. From the west, the railroad grade approaches to within approximately 600 feet of the Northwest corner of the reservoir. From that location to the reservoir, the railroad grade was not present (Appendix A, photos 1-18 and 1-21). Along the northern border, and to the east, of the reservoir, an elevated gravel access road was observed; however, the red fill material characteristic of Red Rock Road was not seen at this location (Appendix A, Photos 1-16 and 1-17).

The topographic maps (Sutherlin and Nonpareil quadrangles) also indicate that the railroad grade is not present in this area: apparently it has been removed (USGS 1988). The land surrounding Red Rock Road generally consists of meadows, cattle pasture, and forested land (E & E 1998).



ecology and environment, inc. International Specialists in the Environment Seattle, Washington	RED ROCK ROAD Sutherlin, Oregon	Figure 2-1 SITE VICINITY MAP		
	APPROXIMATE SCALE 0 25 50 Miles	Job No.: 00061.K30.04-10 CR0201SAT0	Dwg. No.: Fig2-1	Date: 4/13/99

SOURCE: Allstate Motor Club Road Atlas, 1994, Allstate Insurance Company, Northbrook, Illinois.

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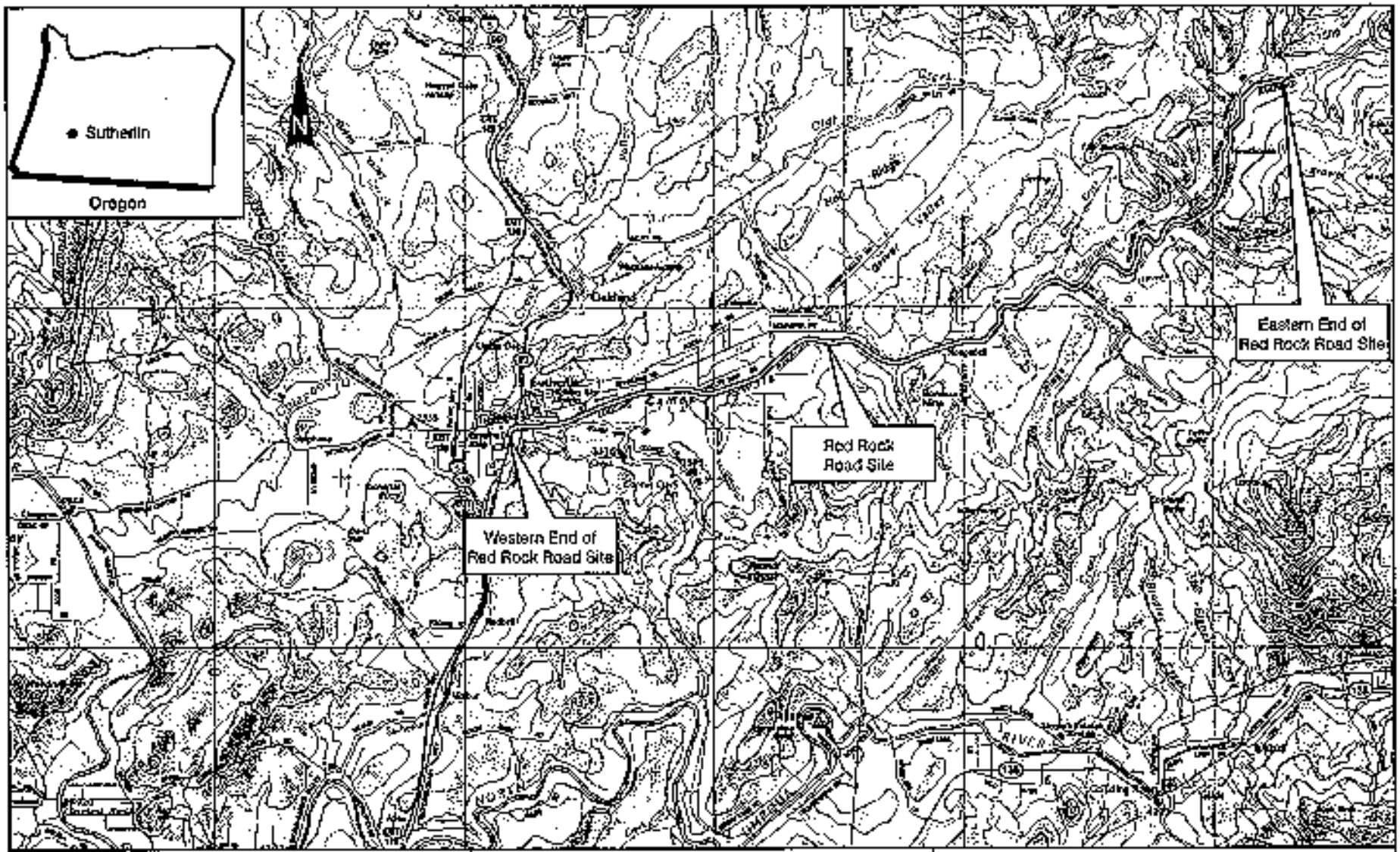

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RED ROCK ROAD
Sutherlin, Oregon

Figure 2-2
SITE MAP

APPROXIMATE SCALE
0 750 3000 Feet

Job No.:	Dwg. No.:	Date:
000611.KJ00.04-10.CF0201SAT0	Fig2-2	4/13/99

SOURCE: Oregon Atlas and Gazetteer, 1998, DeLorme, Yarmouth, Maine

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3. MIGRATION/EXPOSURE PATHWAYS AND TARGETS

The following sections describe migration/exposure pathways and potential targets within the site's range of influence (Figures 3-1 and 3-2).

3.1 GROUNDWATER MIGRATION PATHWAY

The site is located within the Umpqua River Drainage Basin of the Coast Range Physiographic Provence (Orr 1992). Geologic information was available only for the portion of Red Rock Road within the City of Sutherlin west to the vicinity of Nonpareil, Oregon (USGS 1974). As it relates to groundwater supply, the geology of this portion of Red Rock Road consists primarily of the sandstone, siltstone member of the Umpqua Formation and, in places, the overlying quaternary alluvium. The alluvium is composed of sand, gravel, and silt deposited by rivers and streams, including Sutherlin and Calapooya Creeks, and the Umpqua River. The thickness of the alluvium is generally less than 30 feet and is permeable; however, the saturated thickness is generally small. The alluvium serves as a drinking water aquifer only in an area located greater than 4 miles from the site. The sandstone, siltstone member of the Umpqua Formation is thin bedded and contains well-consolidated conglomerate. The thickness of the Umpqua Formation in the area of the site is greater than 600 feet. The Umpqua Formation has a series of folds that trend to the northeast, and the beds dip at an average of 25 to 30 degrees. Because of this, wells drilled in the same vicinity will frequently differ in types of materials penetrated and, therefore, in quantities of water yielded. Yields in the Umpqua Formation range from less than 1 to more than 15 gallons per minute (USGS 1974). The drinking water wells within 4 miles of the site are expected to withdraw water from the Umpqua Formation.

To the east of Sutherlin, the first 2.7 miles of the railroad grade is underlain by the quaternary alluvium which is up to 30 feet thick. From 2.7 miles to 8.0 miles east of Sutherlin the alluvium is absent. However, this entire 8-mile section of Red Rock Road is underlain by the sandstone, siltstone member of the Umpqua Formation to a depth greater than 600 feet. Geologic information is not available for the remaining 9 miles of the railroad grade to its eastern end point. The water depth in wells in a broader study area that includes the 8 miles along the western portion of Red Rock Road ranges from 5 to 50 feet below ground surface (bgs), with a median depth of 20 feet bgs. Water levels in most unpumped wells in the study area fluctuate seasonally between 4 feet and 6 feet. Groundwater elevations generally follow the topography of the land; however, topography alone is not a good indication of groundwater

movement because groundwater movement is significantly affected by permeability. The permeability is usually greatest parallel to the bedding planes, few of which are horizontal in the area of the site. Well depths for the study area range from 55 feet bgs to 200 feet bgs, with a median depth of 90 feet bgs (USGS 1974). The average annual precipitation for Sutherlin, Oregon is 41.09 inches per year (Western Regional Climate Center [WRCC] 1999).

Because of limited geologic data available, the existence or absence of aquifer discontinuities or aquifer interconnections in the vicinity of the site has not been determined (Figure 3-1). It is expected that the site is not located within a wellhead protection area. No on-site monitoring wells exist. The distance to the nearest drinking water well is estimated to be approximately ¼ mile from the site.

In 1974, the USGS performed a water resources investigation in the Sutherlin area including the western 8 miles of Red Rock Road. For wells within the study area, the quantities of groundwater obtained were not adequate for irrigation, municipal, or large industrial use (USGS 1974). No public groundwater wells or public standby wells have been documented within 4 miles of the site (EPA 1998). Approximately 1,118 domestic wells are located with a 4-mile radius of the site (OWRD 1999). Populations using groundwater for drinking water are summarized in Table 3-1.

3.2 SURFACE WATER MIGRATION PATHWAY

Potential contamination from Red Rock Road may impact surface water bodies within two separate watersheds, referred to as “Watershed 1" and “Watershed 2" for reporting purposes (Figure 3-2). The total volume of the source is approximately 316,000 cubic yards; of which, 215,500 cubic yards is expected to be available to migrate into Watershed 1, and the remaining 100,500 cubic yards is expected to be available to migrate into Watershed 2.

The most upstream probable point of entry (PPE) for Watershed 1 is located at the eastern end of Red Rock Road on Calapooya Creek (Figure 3-2). At this location, the railroad grade is located approximately 80 feet south of and approximately 40 feet above Calapooya Creek. It is expected that potential contamination from the railroad grade may migrate into the creek via overland surface water flow at this location. The surface water target distance limit (TDL) for Watershed 1 begins at the most upstream PPE on Calapooya Creek and continues to its confluence at Foster Creek. The most downstream PPE for Watershed 1 appears to be located where Red Rock Road crosses Foster Creek. It is expected that potential contamination may enter Foster Creek via surface water overland flow at this location. The TDL includes 0.1 mile from the most downstream PPE on Foster Creek to its confluence at Calapooya Creek, then continues another 14.9 miles along Calapooya Creek. The TDL for Watershed 1 also includes small sections (less than 0.1 mile) of several tributaries to Calapooya Creek from the place

where Red Rock Road crosses the tributaries to the location where they join Calapooya Creek (USGS 1988).

Approximately one mile downstream from its confluence with Foster Creek, Calapooya Creek continues to the northeast and Red Rock Road bends to the southeast and enters Camas Swale, a low lying area that generally follows Sutherlin Creek to the town of Sutherlin. The most upstream PPE for Watershed 2 is located in this vicinity, near the eastern end of an unnamed tributary that discharges into the Platt I reservoir (Figure 3-2). Based on the topography, it is expected that potential contamination from the railroad grade may enter the unnamed tributary via surface water overland flow at this location. From the most upstream PPE, the TDL for Watershed 2 includes approximately 1.3 miles along the unnamed tributary to the Platt I Reservoir, 0.45 miles along the Platt I Reservoir, and continues another 2.7 miles along Sutherlin Creek to the most downstream PPE along Watershed 2. The most downstream PPE for Watershed 2 is located where Red Rock Road crosses Sutherlin Creek near the western end of the site. It is expected that potential contamination from the railroad grade is either in direct contact with Sutherlin Creek at this location or that it may migrate via overland surface water flow into the creek. From the most downstream PPE, the TDL includes another 9.3 miles of Sutherlin Creek to its confluence with the North Umpqua River, 4.7 miles of the North Umpqua River to its confluence with the Umpqua River, and one mile of the Umpqua River (Figure 3-2; USGS 1988).

The average flow rate for Calapooya Creek at Nonpareil, Oregon, is approximately 206 cubic feet per second (cfs) (USGS 1998a). The average flow rate for Sutherlin Creek at Sutherlin, Oregon, is approximately 26 cfs (USGS 1998b). The depth of water in the Platt I Reservoir is reported to be approximately 16 to 18 feet (Bing 1998). The average flow rate for the North Umpqua River at the Umpqua Basin Water Association surface water intake (within the TDL for Watershed 2) is approximately 3,740 cfs (USGS 1998c).

The railroad grade is relatively flat or gently sloping. The slope of land between the railroad grade and the PPEs into the surface water bodies varies. This slope can be as high as a 50 percent grade (USGS 1988). The site is within a 100-year flood plain (Federal Emergency Management Administration [FEMA] 1978).

Surficial soils in the Red Rock Road area are primarily composed of the Conser-Newburg-Roseburg (CNR) Association. Soils of the CNR Association are found in the low land areas of the Calapooya Creek drainage basin (Troxel 1999). The soil for each association component is classified as follows: Conser, fine textured soil; Newburg, coarse loamy soil; Roseburg, fine loamy soil (Troxel 1999).

The 2-year, 24-hour rainfall event for the Sutherlin area is approximately 3.0 inches at the western end of Red Rock Road and approximately 3.5 inches at the eastern end of Red Rock Road

(National Oceanic and Atmospheric Administration [NOAA] 1973). The drainage area for the entire source is estimated at 29 acres, which is the surface area of the railroad grade. Of this, 19.8 acres is the drainage area of that portion of the source available for containment migration into Watershed 1. The remaining 9.2 acres of the source defines the drainage area for Watershed 2. The upgradient area of the site was not included because, in most locations, the railroad grade is approximately 3 to 5 feet above the surrounding ground surface.

Two public surface water supply intakes are located within the TDL for Watershed 1 (EPA 1998). One surface water intake, operated by the City of Sutherlin, is located on Calapooya Creek at Nonpareil, approximately 0.55 mile from the nearest upstream PPE; it provides drinking water to approximately 5,800 people (Mitchell 1998). The other surface water intake, operated by the City of Oakland, is also located on Calapooya Creek, approximately 9.2 miles from the nearest upstream PPE; it provides drinking water to approximately 850 people (Howard 1999). In addition, surface water from the Platt I Reservoir, within the Watershed 2 TDL, is used to irrigate commercial crops and livestock (Williams 1998). One drinking water intake is located within the TDL for Watershed 2. This intake is operated by the Umpqua Basin Water Association and is located on the North Umpqua River near Riversdale; it serves approximately 8,500 people (Groshong 1999) and is located approximately 12.1 miles from the nearest PPE for Watershed 2 (USGS 1988).

As discussed above, surface water bodies within the TDLs include portions of the Umpqua River, North Umpqua River, Calapooya Creek, Sutherlin Creek and all of Platt I Reservoir. Commercial and subsistence fisheries are not known to exist within the TDL for either watershed (Harris 1999, Duncan 1999); however, sport fishing does occur within both TDLs (Duncan 1999).

There is no available data for fish harvested from the surface water bodies within Watershed 1. However, it is probable that fish are caught for human consumption and not reported to the Oregon State Department of Fish & Wildlife (Duncan 1999). It is expected that approximately 50 pounds of fish are caught for human consumption annually in Watershed 1.

Fish catch data for the section of North Umpqua River from its confluence with the Umpqua River upstream to the Winchester Dam in Winchester, Oregon (all of which is within the TDL for Watershed 2 indicate that 54 winter steelhead trout were harvested during the 1999 season. Based on an average weight of 9 pounds, the total weight of winter steelhead caught within the TDL for Watershed 2 is estimated to be 486 pounds (Duncan 1999). In addition, one Chinook salmon (estimated to weigh 11 pounds) was reported to be harvested in 1998 from the same stretch of river (Duncan 1999). Also three summer steelheads were reportedly caught, with a total weight of 18 pounds. Therefore, it is estimated that the total annual sport catch for this section of the North Umpqua is approximately

515 pounds. No other sport fish catch data were available for surface water bodies located within the TDL for Watershed 2.

Coho salmon (*Oncorhynchus kisutch*), a federal-listed threatened species, exists within the TDL for both watersheds. Coastal cutthroat trout (*Oncorhynchus clarki clarki*), previously a federal-listed endangered species, exists within the TDL for both watersheds. The coastal cutthroat trout was delisted on April 5, 1999 (Duncan 1999, National Marine Fisheries Service [NMFS] 1999a, 1999b).

It is estimated from National Wetland Inventory maps that 2.5 miles of wetland frontage is located within the TDL for Watershed 1, and 3.55 miles are located within the TDL for Watershed 2 (U.S. Fish and Wildlife Service [USFWS] Various Dates). In Watershed 1 there is a PPE directly into a palustrine emergent wetland, which is located between the railroad grade and Calapooya Creek approximately 1.35 miles from Red Rock Road's eastern end (USFWS Various Dates). In Watershed 2 there is a PPE directly into a palustrine emergent wetland located between the railroad grade and Sutherlin Creek approximately 2 miles from Red Rock Road's western end (USFWS Various Dates).

3.3 SOIL EXPOSURE PATHWAY

The nearest residence is located approximately 60 feet from the railroad grade. No one works on the railroad grade. Approximately 1,654 people live within one mile of the site (EPA 1998). The railroad grade is generally not fenced and is accessible by the public. Conflicting information exists regarding whether or not a portion of the railroad grade is used for public recreation (ECSI 1997, Gray 1999). No terrestrial sensitive environments are known to occur on a potential source area. No commercial agriculture, livestock grazing, or livestock production occurs on an area of potential contamination. Livestock grazing does occur within ½ mile of the source. However, no contamination has been observed within the grazing area. Table 3-2 provides population figures for people residing within 1 mile of the site.

3.4 AIR MIGRATION PATHWAY

Approximately 7,927 people live within 4 miles of the site (EPA 1998). The nearest residence is located approximately 60 feet from the railroad grade (USGS 1988). No workers are regularly present on the site (E & E 1998). The Northern spotted owl (*Strix occidentalis caurina*), a federal- and state-listed threatened species, is known to occur within approximately 0.9 miles of the site (Oregon Natural Heritage Program [ONHP] 1999). The rough popcorn flower (*Plagiobothrys hirtus*), a federal-proposed endangered species and a state-listed endangered species, is also known to occur within approximately 0.8 miles of the site (ONHP 1999). A population of approximately 3,000 Columbian white-tailed deer (*Odocoileus virginianus leucurus*), a federal-listed endangered species, is known to occur between 2.6

miles and 3.6 miles of the site (ONHP 1999). Approximately 272 acres of wetlands are located within 4 miles of the site (USFWS various dates). Commercial livestock grazing occurs within ½ mile of the source (E & E 1998). Conflicting information exists regarding whether or not a portion of the railroad grade is used for public recreation (ECSI 1997, Gray 1999). Table 3-3 provides populations and wetland acreage by distance ring within 4 miles of the site.

Table 3-1

GROUNDWATER DRINKING WATER POPULATION WITHIN A 4-MILE RADIUS
RED ROCK ROAD SITE
SUTHERLIN, OREGON

Distance (Miles)	Number of Private Wells	Average Number of Persons/ Household	Persons Served by Private Wells (a)	Persons Served by Public Wells (b)	Total Population per Distance Ring (a) + (b)
0 - 1/4	157	2.60	408.2	0	408.2
1/4 - ½	123	2.60	319.8	0	319.8
½ - 1	199	2.60	517.4	0	517.4
1 - 2	297	2.60	772.2	0	772.2
2 - 3	188	2.60	488.8	0	488.8
3 - 4	154	2.60	400.4	0	400.4
Total					**2907**

Source: EPA 1998; Oregon Water Resources Department (OWRD) 1999; U.S. Department of Commerce (USDC) 1990.

Table 3-2

POPULATIONS WITHIN A 1-MILE RADIUS
RED ROCK ROAD SITE
SUTHERLIN, OREGON

Distance Ring	Population
0 - 1/4 mile	186
1/4 - ½ mile	361
½ - 1 mile	1107
Total	**1654**

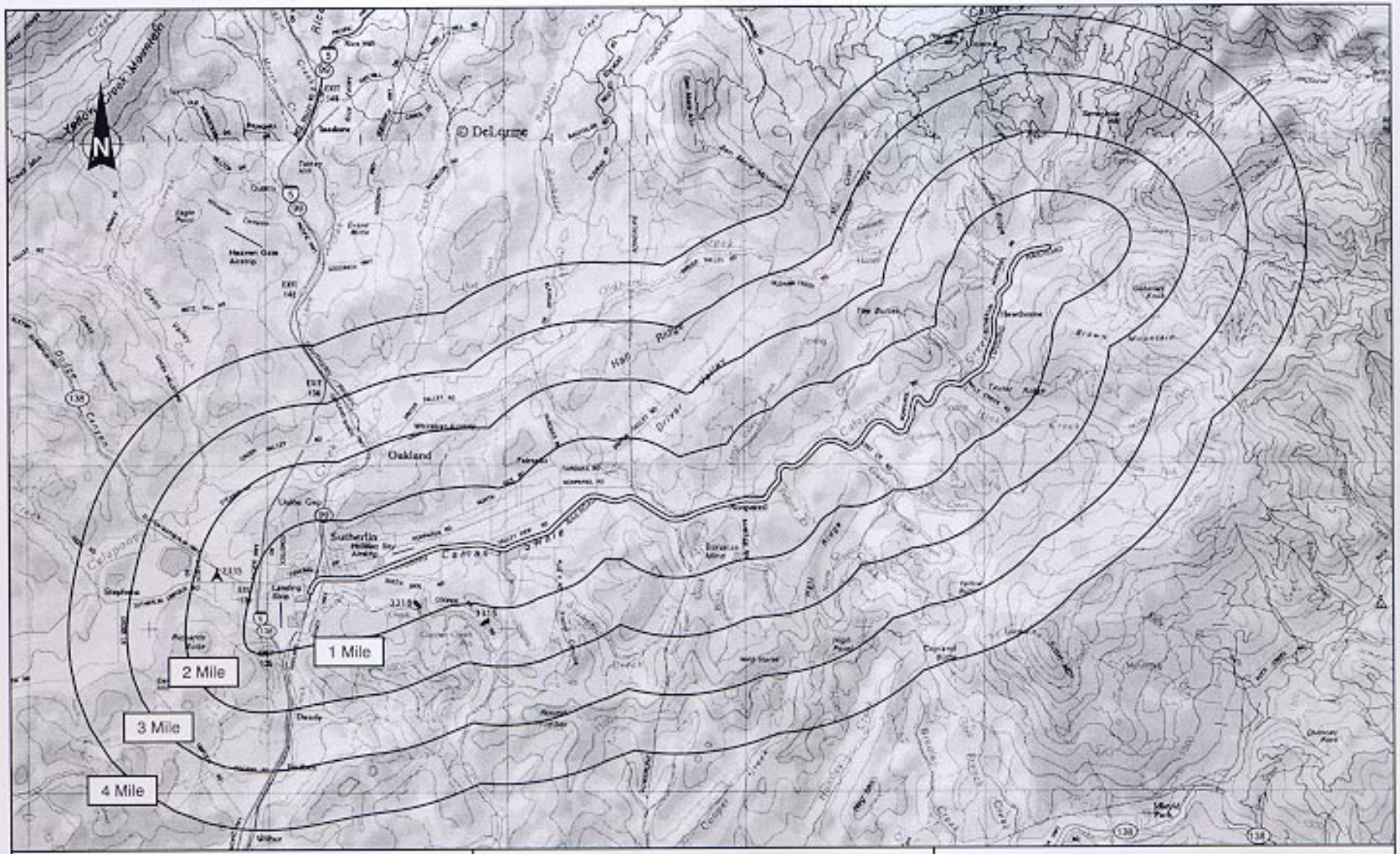
Source: EPA 1998.

Table 3-3

POPULATIONS AND WETLAND ACREAGE WITHIN A 4-MILE RADIUS
RED ROCK ROAD SITE
SUTHERLIN, OREGON

Distance (Miles)	Residents	Wetland Acreage
On a source	0	0
0 - 1/4	186	93
1/4 - ½	361	22
½ - 1	1,107	11
1 - 2	2,951	26
2 - 3	2,478	46
3 - 4	844	74
Total	**7,927**	**272**

Source: EPA 1998, USFWS various dates



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International Specialists in the Environment
Seattle, Washington

RED ROCK ROAD
Sutherlin, Oregon

APPROXIMATE SCALE
0 750 3000 Feet

Figure 3-1
4-MILE MAP

Job No.:	Dwg. No.:	Date:
000611.KJ00.04.-10. CF0201SAT0	Fig3-1	4/13/99

SOURCE: Oregon Atlas and Gazetteer, 1998, DeLorme, Yarmouth, Maine

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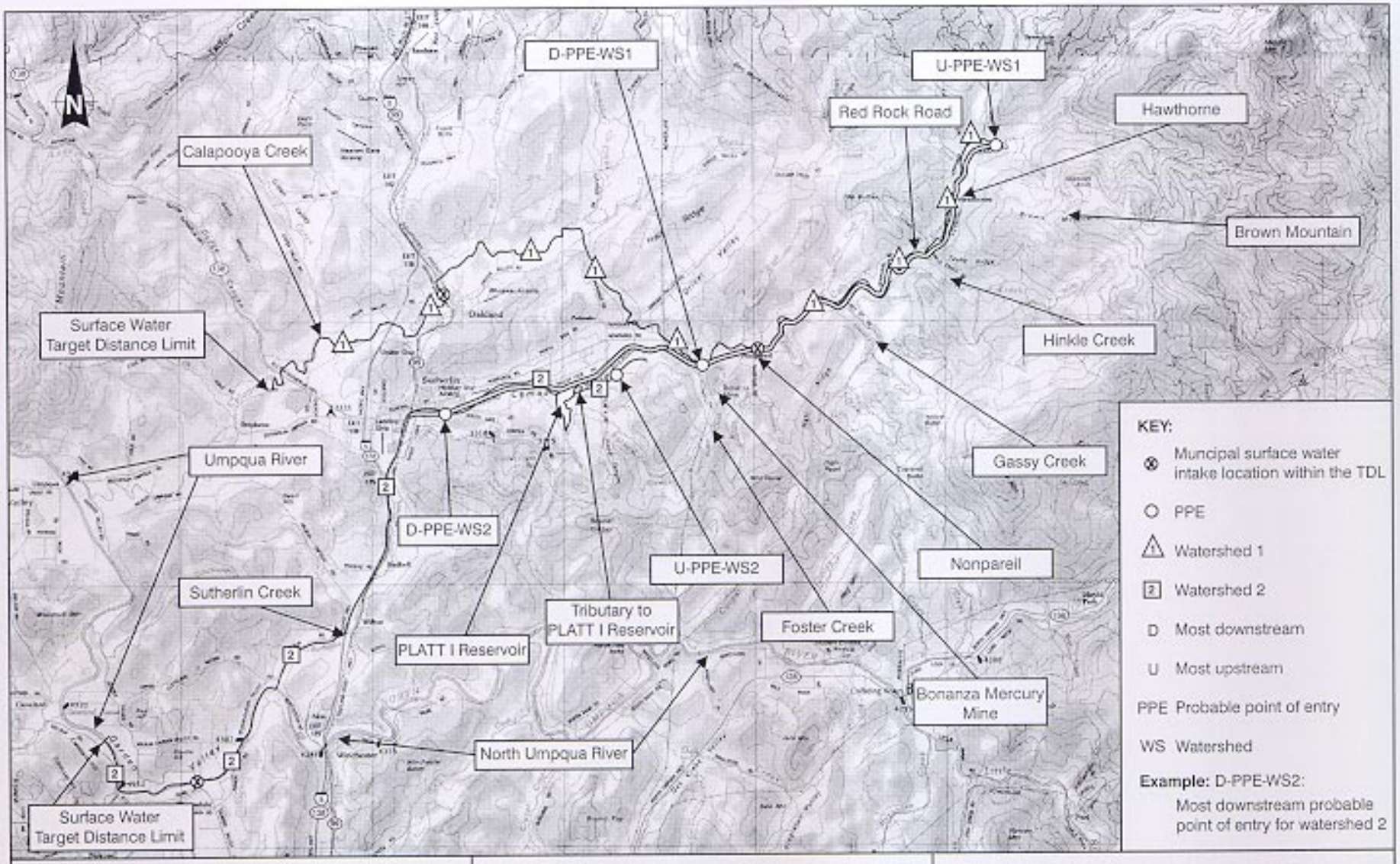

ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

RED ROCK ROAD
Sutherlin, Oregon

APPROXIMATE SCALE
0 750 3000 Feet

Figure 3-2
15-MILE MAP

Job No.:	Dwg. No.:	Date:
000611.KJ00.04.-10.CF0201SAT0	Fig3-2	4/14/99

SOURCE: Oregon Atlas and Gazetteer, 1998, DeLorme, Yarmouth, Maine

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4. REFERENCES

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APPENDIX A

PHOTOGRAPHIC DOCUMENTATION

PHOTOGRAPH IDENTIFICATION SHEET

Camera Serial #: 5701006 **TDD #: 98-06-0002**
Lens Type: 38 - 90 mm Zoom **Site Name: Red Rock Road**

Photo No.	Dir.	Date	Time	By	Description
1-01	E	12/11/98	1255	CG	Red Rock Road crossing over Gassy Creek (facing upstream).
1-02	S	12/11/98	1256	CG	Red Rock Road along Gassy Creek, downstream from photograph 1-01. Shows cattle path on the far side of the creek.
1-03	NW	12/11/98	1257	CG	Calapooya Creek facing downstream. Gassy Creek enters from the left. Red Rock Road on the left side of Calapooya Creek.
1-04	S	12/11/98	1258	CG	Gassy Creek road sign. Bridge going over Calapooya Creek.
1-05	W	12/11/98	1259	CG	Cattle trails from Gassy Creek Road to Gassy Creek.
1-06	E	12/11/98	1300	CG	Cattle located on the east side of Gassy Creek Road.
1-07	W	12/11/98	1301	CG	Access road built on top of Red Rock Road just west of Hinkle Creek.
1-08	E	12/11/98	1302	CG	Bridge (Red Rock Road) over Hinkle Creek.
1-09	E	12/11/98	1303	CG	Stream bank erosion on Hinkle Creek adjacent to Red Rock Road.
1-10	E	12/11/98	1304	CG	Close-up of stream bank erosion on Hinkle Creek.
1-11	SW	12/11/98	1305	CG	Hinkle Creek at Red Rock Road.
1-12	SW	12/11/98	1306	CG	Hinkle Creek at Red Rock Road, facing upstream. Shows shed close to the creek.
1-13	W	12/11/98	1307	CG	Red Rock Road at western end of open access road. Shows the original “Red Rock” material.
1-14	E	12/11/98	1311	CG	Red Rock Road continuing east from Hinkle Creek (left of dead end sign).
1-15	S	12/11/98	1330	CG	Platt I Reservoir.
1-16	E	12/11/98	1332	CG	Access road for Platt I Reservoir, suspected to be Red Rock Road. The reservoir is on the right.
1-17	E	12/11/98	1334	CG	Access road leading east from the reservoir, suspected to be Red Rock Road.
1-18	SW	12/11/98	1338	CG	Red Rock Road continuing west from the west side of Platt I Reservoir. Red Rock Road extends from large pine tree to the right.
1-19	SE	12/11/98	1339	CG	Platt I Reservoir.
1-20	S	12/11/98	1340	CG	Platt I Reservoir.
1-21	N	12/11/98	1345	CG	Red Rock Road continuing west from the west side of Platt I Reservoir. Red Rock Road extends from the large pine to the left.
1-22	E	12/11/98	1350	CG	Red Rock Road at the South Side Road.
1-23	S	12/11/98	1351	CG	Red Rock Road at South Side Road. Koi Farm raises ornamental fish, not used for human consumption.

CG = Charlie Gregory

1-01

1-02

1-03

GASSY CR. RD.
25-4-2.0
ANGLERS
CLOSED
TO
ANGLING
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