NICORE MINING PLAN OF OPERATIONS

Siskiyou National Forest, Josephine County, Oregon

Lead Agency:	U.S. Department of Agriculture Forest Service
Responsible Official:	J. Michael Lunn Forest Supervisor Siskiyou National Forest
Direct comments to:	Mary Zuschlag District Ranger Illinois Valley Ranger District 26568 Redwood Highway Cave Junction, Oregon, 97523.
For more information:	Rochelle Desser Interdisciplinary Team Leader Illinois Valley Ranger District 26568 Redwood Highway Cave Junction, Oregon, 97523 (541) 592-2166

Abstract

The Forest Service (Agency) has prepared this Environmental Impact Statement (EIS) in cooperation with the Bureau of Land Management. The EIS discusses the environmental impacts of implementing the Nicore Plan of Operations. The project would occur within the Rough and Ready Creek Watershed of the Illinois Valley Ranger District, Siskiyou National Forest and Medford District of the Bureau of Land Management. The plan includes mining of four sites totaling 35 acres, road construction and reconstruction, and hauling and stockpiling of ore. This EIS considers the Proposed Action, a No Action Alternative, and four Action Alternatives. In preparing the EIS, the Agency tiered to the Amended Land and Resource Management Plan EIS for the Siskiyou National Forest to avoid re-analysis of issues previously decided. Alternative 4 is the Forest Service Preferred Alternative.

Note to Reviewers

Comments must be post-marked or hand delivered by March 2, 1998 to be considered in the Final EIS. Comments should be written, be as specific as possible, and address the adequacy of the Draft EIS or the merits of the alternatives (including the Proposed Action). Comments are most helpful if they refer to specific page numbers or sections within the EIS. The names and addresses of those who comment on this document will be part of the record and as such, may be released under the Freedom of Information Act.

TABLE OF CONTENTS

LIST OF FIGURES

NICORE PLAN OF OPERATIONS ENVIRONMENTAL IMPACT STATEMENT SUMMARY

INTRODUCTION

A mine claimant has submitted Plans of Operations to the Forest Service (FS) and Bureau of Land Management (BLM). The Plans include about 0.5 miles of road construction and 7.5 miles of reconstruction; the development of 35 acres of nickel laterite mine pits (4 sites); mining about 3 acres per year for 10 years; and use of a 14-mile haul route entirely on public lands. Most of the access route and all of the pits are on Siskiyou National Forest lands. A 5+ acre ore drying and stockpile site is proposed on Bureau of Land Management lands. This Draft Environmental Impact Statement is a joint effort between the BLM and FS.

Many laws regulations, policies and plans direct the agencies to support and facilitate mineral extraction while protecting surface resources:

-The 1872 General Mining Laws
-The Organic Administration Act of 1897
-The Mining and Minerals Policy Act of 1970
-The FS Surface Use Regulations 36CFR 288 Subpart A
-The BLM Surface Use Regulations 43 CFR 3809
-The Federal Land Policy and Management Act of 1976

Specific guidelines exist for the project area. These are contained in the Siskiyou National Forest Plan and Medford BLM District Resource Management Plan and the 1994 Northwest Forest Plan.

THE ANALYSIS AREA

The analysis area is 24 square miles located in parts of Township 40 South, Ranges 8 and 9 West. It is mostly within the Rough and Ready Creek watershed, a tributary of the Illinois River Vicinity Map shown in Figure 1). Portions of the area are within the South Kalmiopsis Inventoried Roadless Area. The area is widely known for its botanical diversity and numbers of rare plants. The BLM Rough and Ready Area of Critical Environmental Concern (ACEC) and Forest Service Botanical Area (MA-4) were established to emphasize protection of botanical resources. The Oregon State Parks also manages the Rough and Ready Botanical Wayside within the project area. Currently, development of an interpretive trail within the wayside and ACEC is in the works.

Recreation within the analysis area includes swimming, botanical exploration, hiking and horseback riding. Most use occurs in the lower reaches of Rough and Ready Creek that are accessible to motorized vehicles. Many mining roads were built within the project area. These roads are not all currently driveable.

The main stem and North Fork of Rough and Ready Creek were found eligible for inclusion into the National Wild and Scenic River system in 1993. Outstandingly Remarkable Values were identified as Hydrology/Geology, Botany/Ecology and Wildlife (O'Brien Caddisfly). The creek provides habitat for many fish species including chinook and coho salmon and steelhead, cutthroat and rainbow trout. These species are either listed or proposed for listing under the Endangered Species Act, or considered sensitive within FS Region Six (R6).

About 1,000 acres within the analysis area are privately owned. Land uses include residential, agricultural and industrial.

ISSUES

Scoping was initiated on this EIS in April 1997 (scoping also occurred in 1993 for the Plan of Operations submitted at that time). Scoping has been accomplished through letters to interested and affected people and meetings with project area residents and the general public. Many people also learned about the project through the media and environmental newsletters. To date, about 400 people have contacted the Forest Service about the project. All public input was read thoroughly and issues were identified. The following issues formed the basis for alternative development and evaluation:

- **Risk of Sediment Delivery**
- **Risk of Toxic Spills**
- **Proposed, Endangered, Threatened and Sensitive (PETS) Fish Species**
- **Port-Orford-cedar Root Disease**
- **Noxious Weeds**
- **Botanical Diversity/Sensitive Plants**
- **Costs of Road Development**
- **Effects on Residents**
- **Visuals, Recreation and Interpretive Development**
- **Roadless Character**
- **Aquatic Conservation Strategy and Riparian Reserve Standards and Guidelines**

ALTERNATIVES

This Draft Environmental Impact Statement (DEIS) considers the effects of the Proposed Action and five alternatives. Maps of the alternatives and a comparison of environmental effects are in the DEIS Chapter Two.

The Proposed Action - The Proposed Action is the Plan of Operations submitted by the miner. It would utilize existing roads as much as possible (total haul route is 14.3 miles), but would require 0.55 miles of new construction and 7.7 miles of road reconstruction. The Proposed Action would include 16 perennial crossings (7 major crossings, 9 tributary crossings).
No Action - The No Action Alternative would deny or defer mining.
Alternative 1 (Private Road) - Alternative 1 would require the miner to attempt to obtain access via the existing private road. Total haul route would be 15.76 miles, with 1.11 miles of new construction and 8.5 miles of reconstruction. Alternative 1 would include 7 perennial crossings (3 major, 4 tributary).

Alternative 3 (Ridge) - This alternative would construct a new road along a ridge top in Sections 2 and 11. Total haul route would be 15.34 miles, with 2.45 miles of new construction, and 7.27 miles of reconstruction. It would require 9 perennial crossings (6 major, 3 tributary).
Alternative 4 (Bench Ridge) - Alternative 4 would construct a new road along a ridge top in Sections 2 and 11, and construct a full bench road on the north side of Rough and Ready Creek within Section 14. Total haul route would be 15.28 miles, with 2.58 miles new construction and 7.15 miles reconstruction. It would require 6 perennial crossings (4 major, 2 tributary).
Alternative 5 (Bridge) - Alternative 5 would use temporary bridges at main stem and South Fork Rough and Ready Creek crossings. Total haul route would be 14.83 miles, with 1.41 miles new construction, and 6.37 miles reconstruction. It would require 11 perennial crossings; 6 are major crossings with bridges and 5 are tributary crossings using culverts.

CHAPTER ONE - PURPOSE AND NEED FOR ACTION

A mine claimant has submitted Plans of Operations to the Forest Service and Bureau of Land Management. The Plans include about 0.5 miles of road construction and 7.5 miles of reconstruction; the development of 35 acres (4 sites) of nickel laterite mine pits; mining approximately 3 acres per year for ten years; and use of a 14-mile haul route entirely across public lands. Most of the access route and all of the pits are located on Forest Service (FS) administered lands. A 5+ acre ore drying and stockpile site would be located on Bureau of Land Management (BLM). This Draft Environmental Impact Statement (DEIS) is a joint effort between the Siskiyou National Forest and the Medford District of the Bureau of Land Management. The Responsible Official is the Siskiyou National Forest Supervisor, who, along with the BLM Medford District Manager, would ultimately approve the final Plans of Operations. Many laws, regulations, policies and plans guide the analysis and eventual approval of a Plan of Operations and provide the basis for the Purpose and Need for Action.

LAWS, REGULATIONS, POLICIES and PLANS

Many laws, regulations, policies, and plans direct the FS and BLM to support and facilitate mineral extraction while protecting surface resources to the extent possible. The **1872 Mining Law** states that all valuable mineral deposits in lands belonging to the United States are to be free and open to exploration. The **Organic Administration Act of 1897** grants authority to the Forest Service to regulate surface resources of National Forest System lands. The **Mining and Minerals Policy Act of 1970** directs the Federal Government to foster and encourage private enterprise in the orderly and economic development of domestic mineral resources.

The **Forest Service Surface Use Regulations** (36 CFR 228, Subpart A - also known as the 228 Regulations) sets forth rules and procedures for use of the surface of National Forest System Lands in connection with mineral operations. These regulations direct the Forest Service to prepare the appropriate level of National Environmental Policy Act (NEPA) analysis and documentation when proposed operations may significantly affect surface resources. These regulations do not allow the Forest Service to deny entry or preempt the miners statutory right granted under the 1872 Mining Law. The 228 Regulations state that an operator is entitled to access in connection with the operation, and that access must be approved in writing before use can begin. The regulations also require the FS to develop mitigation measures to minimize adverse impacts on the national Forest System. The 228 Regulations include requirements for reclamation. The **Forest Service Manual (FSM) 2800** also discusses specific responsibilities and considerations for dealing with Plans of Operations. It states that the Forest Service should minimize or prevent adverse impacts related or incidental to mining by imposing reasonable conditions that do not materially interfere with operations. It also requires the Forest Service to evaluate proposals for road construction and reconstruction and consider alternatives that may be less damaging to surface resources (see FSM 2817.25).

The **Federal Land Policy and Management Act of 1976** (FLPMA) states that public lands will be managed recognizing the need for domestic sources of minerals. In addition, FLPMA established the concept of "Areas of Critical Environmental Concern (ACEC)". The **BLM Surface Management Regulations** (43 CFR 3809) were developed to prevent unnecessary or undue degradation of public lands related to mining, as directed by FLPMA.

The **Siskiyou Land and Resource Management Plan (Siskiyou Forest Plan)** includes several Minerals Standards and Guidelines (page IV-55). These guidelines discuss the need to facilitate the orderly development of mineral commodities and provide for timely, reasonable, effective and economically feasible environmental protections. The Siskiyou Forest Plan was amended by the **1994 Northwest Forest Plan.**[1] The Northwest Forest Plan provides additional guidance for minimizing impact to surface resources, especially in relationship to the **Aquatic Conservation Strategy.** The **Medford District Resource Management Plan (BLM Management Plan)** includes mineral administration direction and also incorporates the Northwest Forest Plan Standards and Guidelines.

In 1993, the Siskiyou National Forest completed a study to determine whether Rough and Ready Creek and/or its tributaries were eligible for Wild and Scenic River designation. The main stem and North Fork of Rough and Ready Creek were found eligible. Outstandingly Remarkable Values - ORV's[2] include Botanical/Ecological, Hydrological/Geological, and Wildlife. **Chapter 8 of the Forest Service Planning Handbook** expresses the policy of protecting eligibility status pending further determination of the river's suitability for inclusion into the **National Wild and Scenic River System.**

The Nicore Draft Environmental Impact Statement (DEIS) tiers to the plans and analysis documents discussed in this chapter.

PURPOSE AND NEED

The purpose of this analysis is to determine reasonable measures to protect resources on BLM and National Forest System lands given the claimant's right to mine. The need for action is to respond to the claimant's Plan of Operations. The outcome of the EIS process will be a final Plan of Operations that avoids unnecessary resource damage.

---

[1]Northwest Forest Plan is embodied in the Federal Ecosystem Management Analysis Team documents, particularly the Record of Decision for the Amendments to Forest Service and Bureau of Land Management Documents within the Range of the Northern Spotted Owl and the Standards and Guidelines.

[2]Outstandingly Remarkable Values are described in the 1993 Eligibility Study.

DECISIONS TO BE MADE

The Siskiyou National Forest Supervisor, as the FS Responsible Official for this EIS, will decide whether to accept the Plan of Operations as submitted by the miner, or to require a revised Plan of Operations that includes mitigating measures. Aspects of the mining operation that may be affected include haul routes, road design and maintenance criteria, operating season, reclamation objectives, and monitoring and reporting requirements. The Forest Supervisor may also decide that insufficient information exists to analyze and approve the operation and additional information is necessary.

The Medford District Manager, as the BLM Responsible Official, will decide what stockpile site is environmentally preferred and what mitigating measures would reduce environmental effects. Mitigating measures may also be applied to the haul route on BLM lands in Section 18.

The policies and regulations described previously differ between BLM and FS. The Responsible Officials will base their decisions on agency-specific guidance. For both agencies, the decision-makers have limited discretion over the mining operation.

THE ANALYSIS AREA

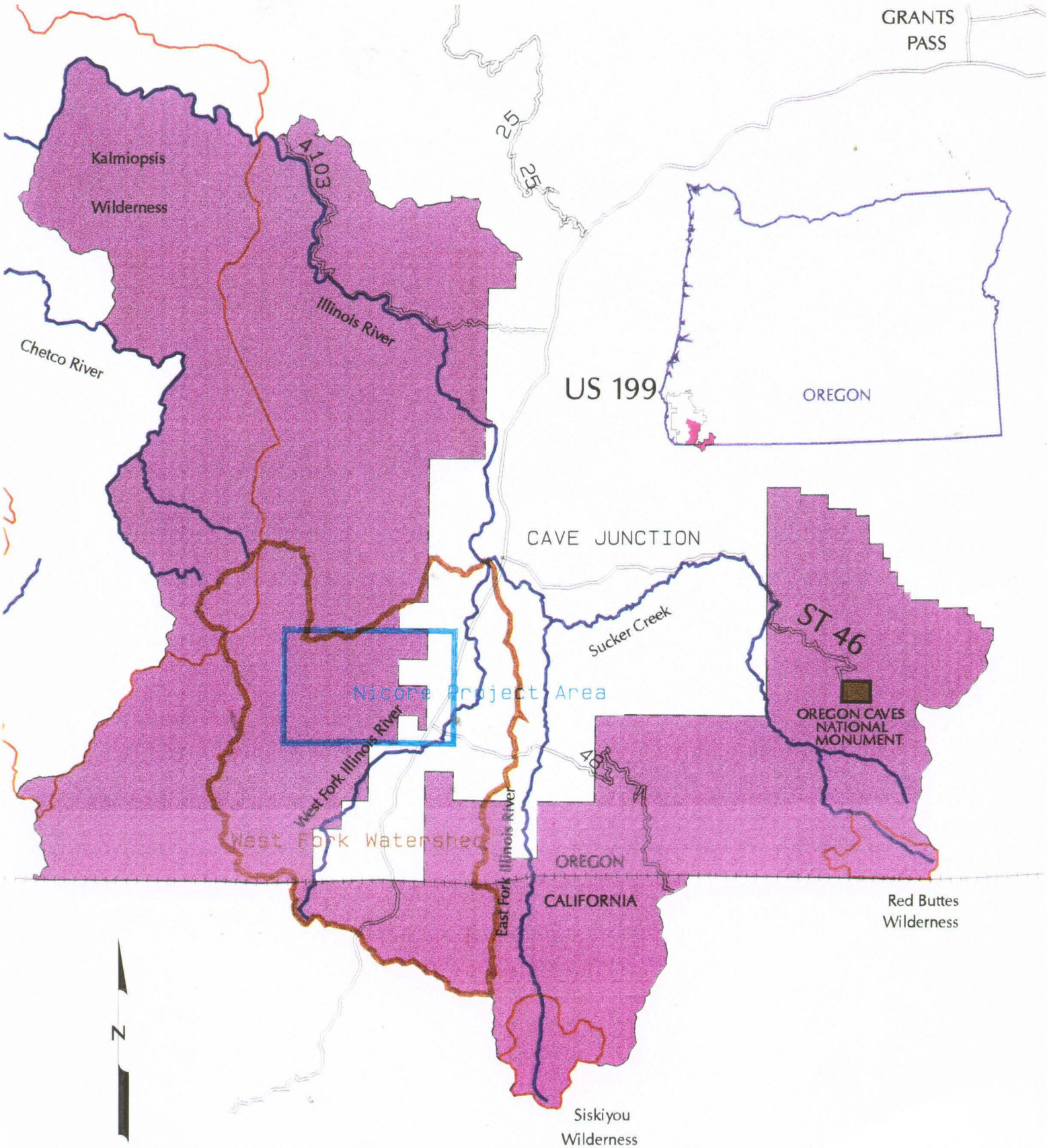
The analysis area is shown in Figure 1, Vicinity Map. It is a 24-square mile area (about 15,000 acres) encompassing parts of Township 40 South, Range 9 West and Township 40, Range 8 West. The actual mine sites comprise about 35 acres of the analysis area. The haul route includes about 14 miles of roads. The area is almost entirely within the Rough and Ready Creek watershed, a tributary of the West Fork Illinois River. Nearly two-thirds of the area is within the South Kalmiopsis Inventoried Roadless Area (see Appendix C of the Siskiyou National Forest Plan FEIS).

The area is widely recognized for its botanical diversity. The FS Rough and Ready Creek Botanical Area comprises about 1500 acres of the analysis area. The BLM Rough and Ready Area of Critical Environmental Concern comprises about 1200 acres. Oregon State Parks also manages a small portion of the area, including the 11-acre Rough and Ready Botanical Wayside. Additional FS land allocations include Matrix, Administrative Study Area, and Riparian Reserve. The remainder of the analysis area is privately owned (less than 1,000 acres).

Most of the access route has been previously developed and disturbed. During the 1940's, a Swedish miner, Fred Alberg, hand built a road several miles into the North Fork Rough and Ready Creek, where he developed a small gold mine. Limited chromite and nickel exploration began during World War II and continued into the 1950's. Nickel laterite sampling occurred during the 1970's and 1980's. Many of the existing low-standard roads were built using heavy equipment during that time. Limited mineral exploration accessed by these roads has continued to the present.

Figure 1

ILLINOIS VALLEY RANGER DISTRICT



SISKIYOU NATIONAL FOREST - NICORE PROJECT

ALTERNATIVE 4 - BENCH/RIDGE

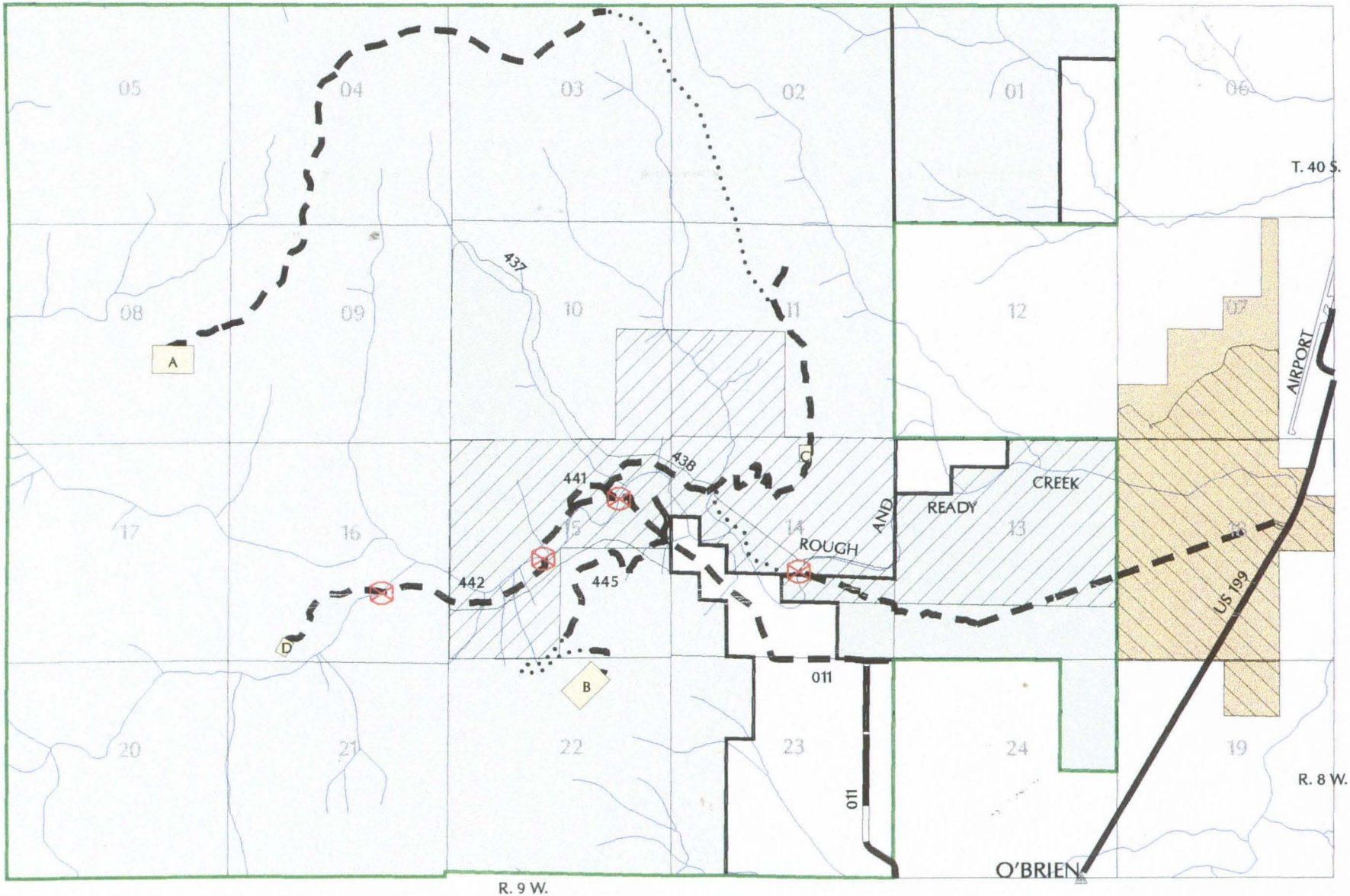


Figure 6

PROJECT HISTORY

A Proposed Plan of Operations for the Nicore project was originally submitted to the FS in December, 1992. The District Ranger determined that an Environmental Impact Statement (EIS) would be necessary because of potential significant impacts to the human environment. The mining claimant appealed this finding, but it was upheld by the Regional Forester. Funding to complete an EIS was requested, and was forthcoming in 1996. In 1996, the mining claimant revised the Plans of Operations and proposed additional mine and road development. In March of 1997, the claimant submitted further documentation to the FS and BLM regarding the project.

The following chronology includes records of correspondence between the miner, the miner's attorney (Stephens), and Forest Service/BLM personnel.

Date	Subject	Author
3/16/92	Plan of Operations (POO)	Miner
12/17/92	Plan of Operations	Miner
11/19/93	Plan of Operations - modifications	Miner
11/29/93	Letter acknowledging POO modifications	Zuschlag
8/9/96	Letter from Stephens-status of POO	Stephens
8/14/96	Letter to Stephens-SUD completion date	Zuschlag
11/21/96	Letter to miner- more/better info. needed	Gauthier-Warriner
12/18/96	Letter to Stephens status of SU.D.	Lunn
1/6/97	Letter to Stephens-forwarded SUD	Gauthier-Warriner
1/23/97	Letter to miner-more/better info. needed	Zuschlag
1/31/97	Letter documenting Miner/FS POO meeting	Nolan
2/10/97	Letter from miner-clarifies 3 items	Miner
2/10/97	Letter from Stephens-will provide info.	Stephens
2/19/97	BLM Letter to miner-need POO	Korfhage
2/24/97	Letter to Stephens-SUD findings	Zuschlag
3/3/97	Letter to Stephens-need amended POO	Zuschlag
3/12/97	More info on size & location of sites	Miner
3/19/97	Agreement that PA is reasonably accurate	Miner
3/19/97	Letter from miner-provides info to BLM	Miner
3/21/97	Letter from Stephens-phase 1 & 2 clarified	Stephens
6/5/97	Letter from Stephens-what is status of EIS	Stephens
6/16/97	Letter to Stephens-proceeding with EIS	Zuschlag
11/6/97	Letter to Stephens-more/better info needed in record	Zuschlag
12/10/97	Letter to Zuschlag- info has already been provided	Stephens

ISSUES

Scoping was initiated for this EIS in April 1997 (Scoping also occurred in 1993 for the original Plan of Operations). Scoping has been accomplished through letters to interested and affected people and meetings with area residents and the general public. Many people also learned about the project through the media and environmental newsletters. A "Save Our Siskiyou" letter campaign generated many comments. A photograph and article about the project published in Sunset Magazine also prompted many people to provide input. To date, over 400 people have contacted the Forest Service about the project. All public input was read thoroughly and issues were identified. The following issues formed the basis for alternative development and evaluation.

Risk of Sediment Delivery

The proposed road development and use, stream crossings, excavation of mining pits and other aspects of the operation are likely to increase sediment delivery to Rough and Ready Creek and its tributaries. Increased sediment can lead to adverse effects on water clarity and reduce fish habitat quality. The action alternatives are designed to minimize sediment delivery through the use of Best Management Practices, road design standards, removing crossing structures annually and placing them away from the stream, and locating the stockpile site out of Riparian Reserves. However, some increased sediment would be expected even with mitigation.

Risk of Hazardous Fluid Spills

The Proposed Action is associated with increased risk of fuel or other hazardous substances accidentally reaching Rough and Ready Creek, especially in the vicinity of the the multiple stream crossings. People living within the analysis area have expressed concern that their drinking water could be fouled by an accidental spill. The risk of a serious spill is low, however the consequences could be significant.

Proposed, Endangered, Threatened and Sensitive (PETS) Fish Species

Rough and Ready Creek provides habitat for several PETS fish species (coho salmon are listed as threatened, steelhead trout are FS Region Six sensitive and proposed for federal listing, chinook salmon and cutthroat trout are Region Six sensitive). The Proposed Action may adversely affect fish and their habitat by restricting fish passage at road crossings and degrading other habitat features.

Port-Orford-cedar Root Disease

The Proposed Action increases the risk of importing Port-Orford-cedar (POC) root disease into the Rough and Ready Creek Watershed. The action alternatives include strategies to prevent or slow the spread of the disease. The alternatives are compared based on the relative risk of introducing the disease into currently uninfested areas.

Noxious Weeds

The Proposed Action may lead to the spread of noxious weeds that can out-compete rare and native vegetation. All of the action alternatives include some mitigation to reduce the risk of spread of noxious weeds. The alternatives are compared based on the relative risk of spreading noxious weeds.

Botanical Diversity/Sensitive Plants

The proposed haul route and mine site traverses the Rough and Ready Botanical Area and Area of Critical Environmental Concern (ACEC). At least 14 different sensitive plant species (about 60 individual sites) may be affected. Botanical Area Standards and Guidelines require the FS to make "every effort" to protect these species. The alternatives are compared based on the numbers of known sites that could be affected by the project.

Costs of Road Development

The various components of the access route have different direct costs. Road construction and reconstruction costs, crossing structures, dust abatement and haul costs are considered.

Effects on Residents

The Proposed Action and its alternatives have adverse impacts particular to people living near the haul route. These effects relate to increased dust and noise, decreased solitude, and increased safety hazards. Mitigation included in all action alternatives are intended to minimize adverse effects, but some impacts cannot be avoided.

Visual Quality, Recreation and Interpretive Development

The Proposed Action may degrade scenic quality of the analysis area by developing roads and a stockpile site within direct view of Highway 199, the Rough and Ready Botanical Wayside and the BLM Area of Critical Environmental Concern. The Proposed Action may reduce the area's value as an interpretive site. Improvement and use of low standard roads may affect people who use them as hiking trails or increase the number of people using the area.

Roadless Character

The Proposed Action includes some road development within an inventoried roadless area. Much of the Rough and Ready watershed is isolated from human intrusion. People value the isolated character of the area. Roads can bring in unwanted traffic and lead to adverse environmental impacts (most of which are also addressed within other issues).

Aquatic Conservation Strategy and Riparian Reserve Standards and Guidelines

The Aquatic Conservation Strategy from the Northwest Forest Plan sets objectives to maintain and restore ecosystem health. It provides an integrated approach to riparian management. Many standards and guidelines apply specifically to riparian areas. Proposed mining and access may retard attainment of the Aquatic Conservation Strategy and not fully meet Riparian Reserve Guidelines.

Wild and Scenic River Eligibility - Outstandingly Remarkable Values

The main stem and North Fork of Rough and Ready Creek was found eligible for Wild and Scenic River status. Botanical, Wildlife, and Geological/Hydrological values were found to be Outstandingly Remarkable (see Eligibility Study in the Analysis Files). Current policy requires the Forest Service to "protect and where possible, enhance these Outstandingly Remarkable Values (ORVs)". The Proposed Action and action alternatives may have adverse effects on these ORVs.

OTHER ISSUES

Many other issues were brought up during scoping. These issues either did not lead to potential significant effects or could not be analyzed within the scope of this EIS. Brief discussions about these other issues are included in Chapter Four.

CHAPTER TWO
ALTERNATIVES INCLUDING THE PROPOSED ACTION

PROPOSED ACTION (Plan of Operations as Proposed by the Mine Claimant)

The Proposed Action would approve the Plans of Operations as submitted by the claimant. The operation would extract nickel laterite from four deposits located in Section 22, Section 8, Section 11, and Section 16 of T.40 N., R.9 W., Willamette Meridian. The areas to be mined total about 35 acres. Specific elements of the Proposed Action include:

Mining Operation

1. Each excavation site would be cleared of all organic material and topsoil (about 12 inches of soil and organic material would be set aside and stored at the mine site for use in reclamation).
2. The highest grade laterite would be excavated, screened, and loaded on trucks. Oversize material (rocks larger than 1 inch that do not pass the screen) would be returned to the bottom of the pit. Typically the oversize material would range between 40% and 60% of the volume. The average depth of the laterite is about 12 feet.
3. About 3.1 acres per year would be mined over a 10 year period.
4. The primary equipment on site would be a 2 cu. yd. excavator, mobile screening unit, dozer, and a 5 cu. yd. front end loader. Support equipment would include personnel transport and other service trucks and maintenance equipment. A fuel storage, transportation, and spill plan would be part of the final Plan of Operations.
5. The operating period would be confined to daylight hours during the dry time of year, generally between June 15 and Oct. 15.

Haul Route

1. The haul route is shown in the ***Proposed Action Map (Figure 2)***[1]. The map is accompanied by a legend that applies to maps for the Proposed Action and all alternatives. The total haul route would include 14.3 miles. About 7.7 miles of road would be reconstructed (widened and surfaced) and about 0.55 miles of road (0.25 miles to Mine Site B and 0.3 miles between Crossing 3 and 4) would be constructed. The existing road up "Alberg Cr."[2] would be reconstructed, along with portions of all other access roads. Road design criteria are summarized here; detailed road specifications are in the Road Access Documentation Memo in the Analysis files.

---

[1]Figure 2A is a legend that applies to the Proposed Action and Alternative Maps. Stream crossings on the main stem and South Fork Rough and Ready Creek are numbered on the Proposed Action Map.

[2]"Alberg Cr." refers to the unnamed tributary that Road 437 follows.

*Road grades will not exceed 25% except a few short pitches (200 feet or less) that may be up to 30%.
*Where feasible, water bars and/or cross ditches would be "built in" for grades greater than 10%. Some annual stormproofing would also be required.
*Road surfaces would be outsloped except on flats or on the route to Site B. The 445 road to Site B would be insloped and would require drainage control structures.
*Borrow material would be required to fill and widen some sections of the access route. The source of this material has not been determined, but could be waste material from crushing rock surfacing (more discussion on rock surfacing is in 2. below).

2. Maintenance work such as water bars, spot rocking, minor cutbank sloughs, and minor washout repair throughout the haul route would be accomplished by the miner. Rock used for road surfacing would be free of Port-Orford-cedar root disease and noxious weeds. The rock is likely to come from a source on public land within the analysis area. Any rock source, whether within or outside the analysis area, would have to be approved by the FS and BLM, and may require additional analysis before final approval.
3. The ore haul route would cross the main stem Rough and Ready Creek 6 times and would involve 10 perennial tributary crossings. All crossings would utilize washed rock fords. The rock would be carried away during high flow each winter, and new rock would be added after June 15 the next year. A year-round culvert would be placed in the "Wing and Ferren" ditch.
4. The haul trucks would be 25 ton off-highway articulated dump trucks with "rough terrain" capability and a tight turning radius suitable for use on low standard roads.
5. The estimated production rate would result in approximately 15 to 20 round trips per day.

Ore Stockpiling

The laterite material would be hauled to a 5 to 10 acre area on Bureau of Land Management (BLM) lands in Section 18. The ore would be stockpiled at this site. The ore would be dried and eventually transported to a smelter. Highway vehicles would be used to transport the ore.

Reclamation

Under the Proposed Action, about 12 inches of topsoil and organic material would be spread back over the oversized rock in the pits. The average final grade of the reclaimed pits would be about 6 feet lower than the original grade. To keep the disturbed but un-reclaimed area to a minimum, site reclamation would be kept current with the operation so no more than a total of five acres would be open at any one time. Reclamation work would be accomplished annually prior to the winter wet season.

NO ACTION

The No Action alternative would not approve the Nicore Plans of Operations. Roads would not be constructed, reconstructed, or maintained. Under the No Action alternative, some mining activities could continue via Notices of Intent[3]. ***Figure 3 shows the existing access in the analysis area.*** Figure 9 - Effects of the alternatives in terms of the issues, and Chapters Three and Four provide more detail about the conditions that would continue under the No Action Alternative.

MITIGATION INCLUDED IN ALTERNATIVES TO THE PROPOSED ACTION

Alternatives 1, 3, 4 and 5 would include the following mitigation to minimize adverse effects and meet laws, regulations, standards and guidelines[4].

1) All necessary permits would be obtained from applicable state, federal, or other agencies prior to beginning operations annually. Permits that may be required include (but are not limited to):

a) Oregon Department of Environmental Quality - National Pollutant Discharge Elimination System Permit;
b) Oregon Department of Environmental Quality - Water Pollution Control Facility Permit;
c) Oregon Division of State Lands - General Authorization Permit;
d) Oregon Division of State Lands - Removal/Fill Permit;
e) Oregon Department of Geology and Mineral Industries Operating Permit, Reclamation Plan and Bond; and
f) Oregon State Water Master Permit to Withdraw Water from Rough and Ready Creek (for use in dust abatement and other road activities).

2) A reclamation plan detailing *how* reclamation would be accomplished is a required part of the Plan of Operations and must be completed prior to final approval. Reclamation objectives include:

a) restoration of native vegetation at mine sites and stockpile sites;
b) drainage and erosion control at mine sites;
c) stormproofing and erosion control along the haul route.

Native soils and plant materials would be required. An appropriate bond would be posted adequate to fund annual and final clean-up and reclamation. The work area would be kept clean and neat at all times. All refuse would be regularly removed from federal lands. Final reclamation would include removal of all mining equipment and implements. Final reclamation would be required any time operations cease for 12 consecutive months, unless otherwise approved.

---

[3]Mining activities that do not result in significant surface disturbance are ongoing under Notices of Intent.

[4]Alternative 2 was dropped from consideration and is discussed later in this chapter.

3) An alternate stock pile site would be selected that meets the following criteria:
   a) outside riparian reserves (to meet Northwest Forest Plan Guideline MM-2);
   b) hidden from Botanical Wayside, proposed Interpretive Trail viewpoints and Hwy 199;
   c) avoids sensitive plants and unique habitats;
   d) access to stockpile site would avoid concentrations of noxious weeds, specifically star thistle.

Two or more options are known that currently meet these criteria. They will be surveyed for sensitive plants and a site identified prior to publishing the Final EIS. These sites are both in Section 18 on BLM lands near the haul route (a map of the sites is in the project file). The alternative sites may require a short distance of road construction.

4) The operator would contact the Forest Service immediately prior to seasonal shutdown and before equipment removal to allow for site inspection and annual reclamation measures (36 CFR 228.10). The operator would also contact the Forest Service prior to annual start-up.

5) Road construction and reconstruction design criteria would be established to meet all BLM and FS standards including Road Management guidelines in the Northwest Forest Plan. Specific design elements are in the Road Access Documentation Memo in the Analysis files.

6) Best Management Practices would be incorporated into all aspects of road work and project design. A list of Best Management Practices associated with the project are in the analysis file.

7) Vegetation removed in mining or road development activities would likely be used for mine site reclamation or road stabilization. The FS or BLM would have to approve site specific disposal of unwanted material. Merchantable-size timber would be the property of the FS or BLM. Few merchantable-size trees are likely to be cut incidental to operations.

8) All action alternatives would include a Port-Orford-Cedar (POC) Root Disease Containment Strategy, aimed at reducing the risk of introduction of root disease into the project area. These actions are guided by Siskiyou National Forest Management Goals, Standard and Guidelines (see S&G 12-8), and the Aquatic Conservation Strategy Objectives 8 and 9. Disease control measures considered include seasonal restrictions, vehicle and equipment washing, use of root disease-free rock in all road work, and sanitation of POC in selected areas (chapter four includes details about the disease control strategy).

9) Access roads would be gated to eliminate unauthorized vehicular traffic to the north side of Rough and Ready Creek. A gate would also be placed at mine site B to restrict traffic from the south. Gate locations would be established by the Forest Service. Motorized access beyond the closures would be restricted to mining operations and administration. Motorized access to the north side of Rough and Ready Creek would be prohibited between September 15 and June 15 annually, unless otherwise authorized by the Forest Service.

SISKIYOU NATIONAL FOREST - NICORE PROJECT

ALTERNATIVE 3 - RIDGE

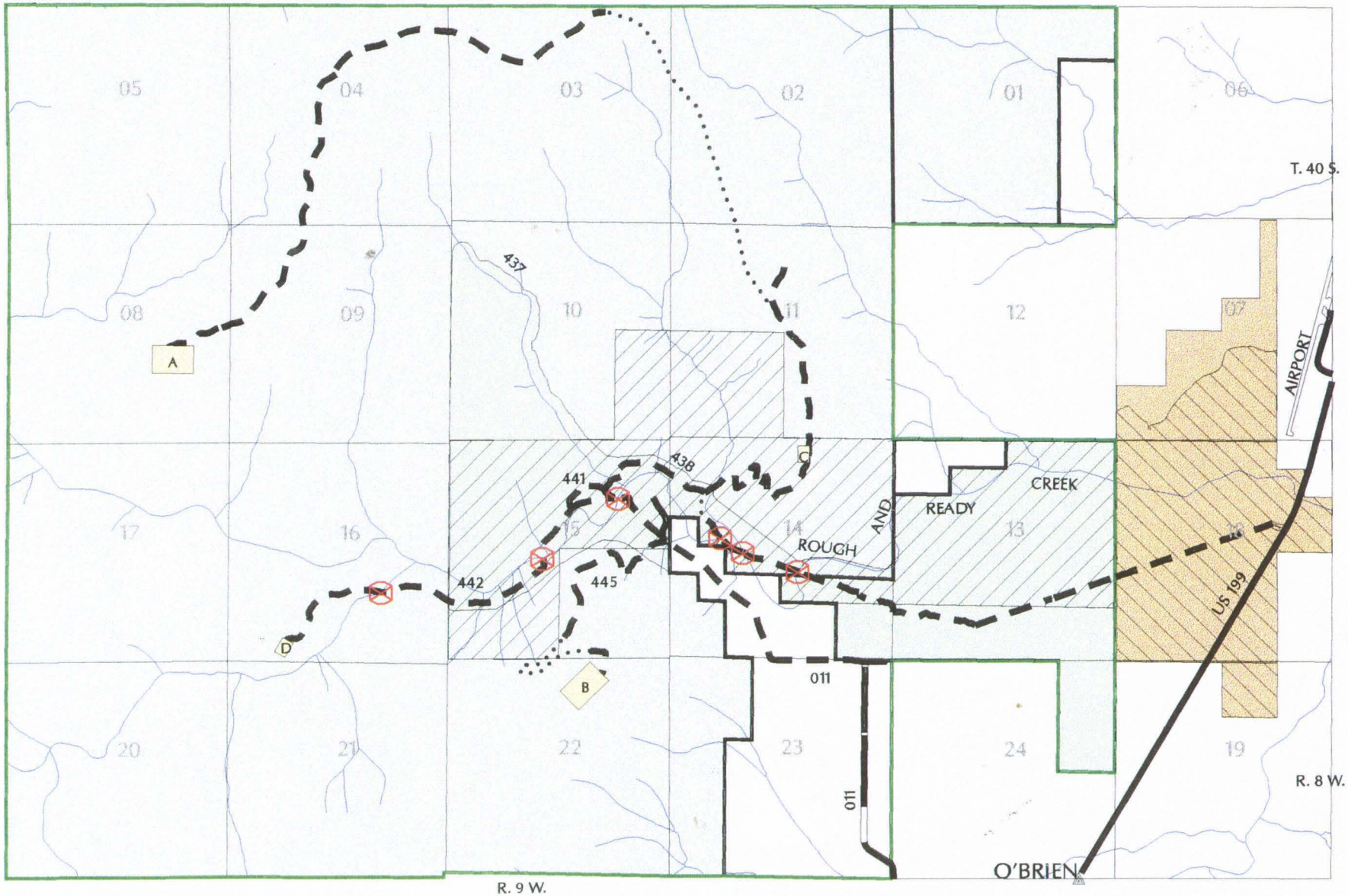


Figure 5

SISKIYOU NATIONAL FOREST - NICORE PROJECT

ALTERNATIVE 1 - PRIVATE ROAD

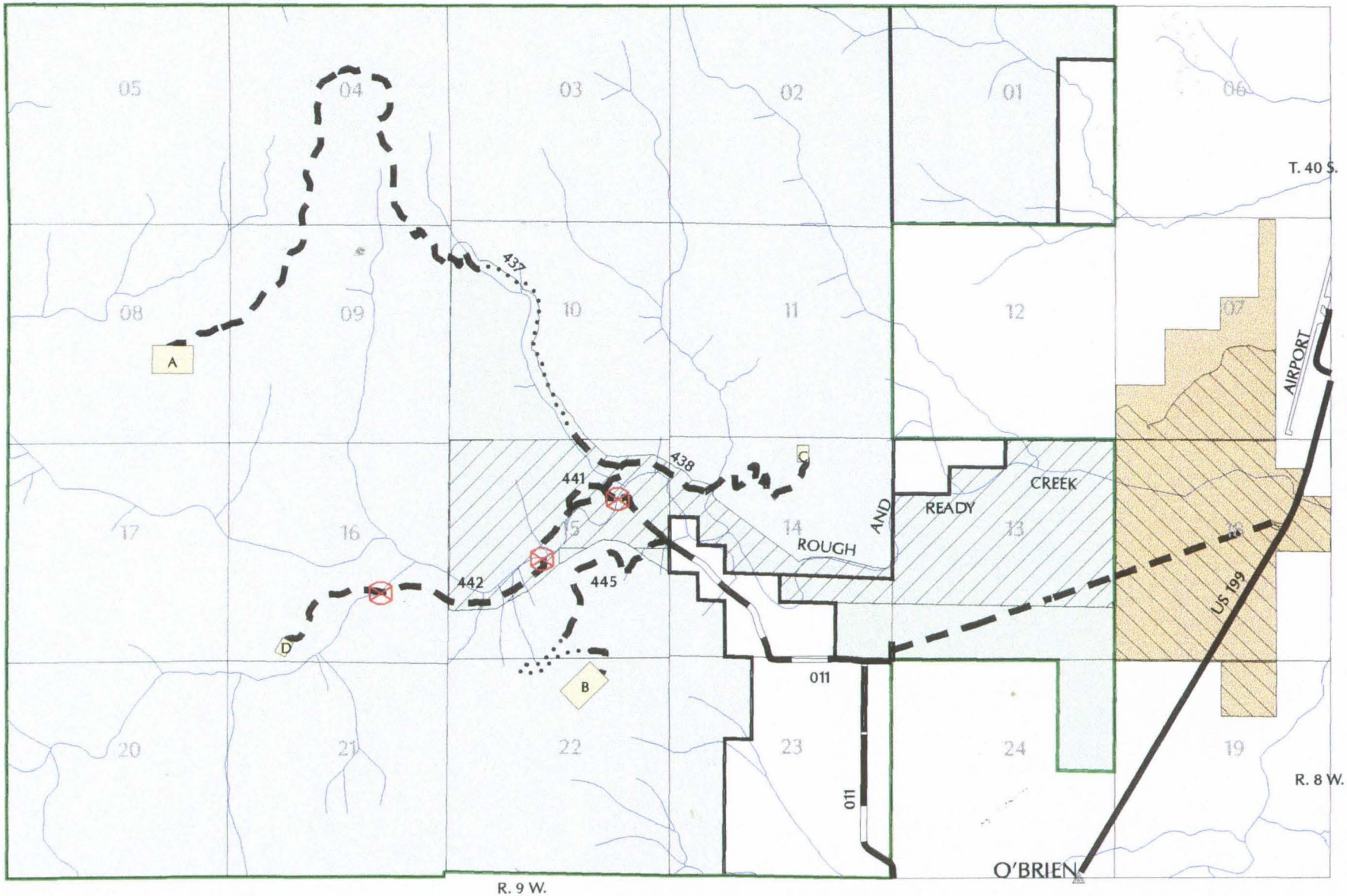


Figure 4

SISKIYOU NATIONAL FOREST - NICORE PROJECT

NO ACTION

EXISTING CONDITION

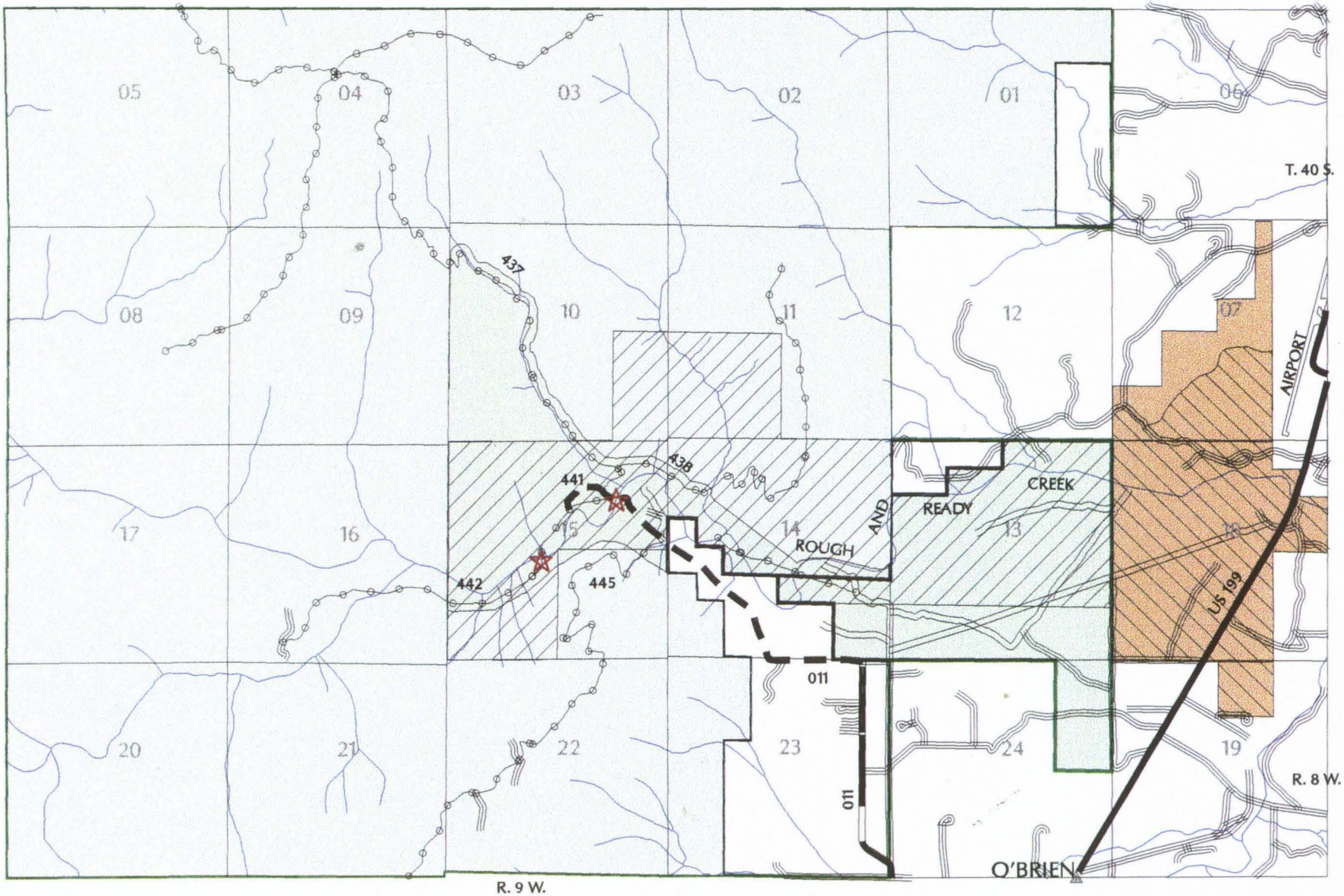


Figure 3

SISKIYOU NATIONAL FOREST - NICORE PROJECT

PROPOSED ACTION

MINERS PLAN OF OPERATIONS AS SUBMITTED

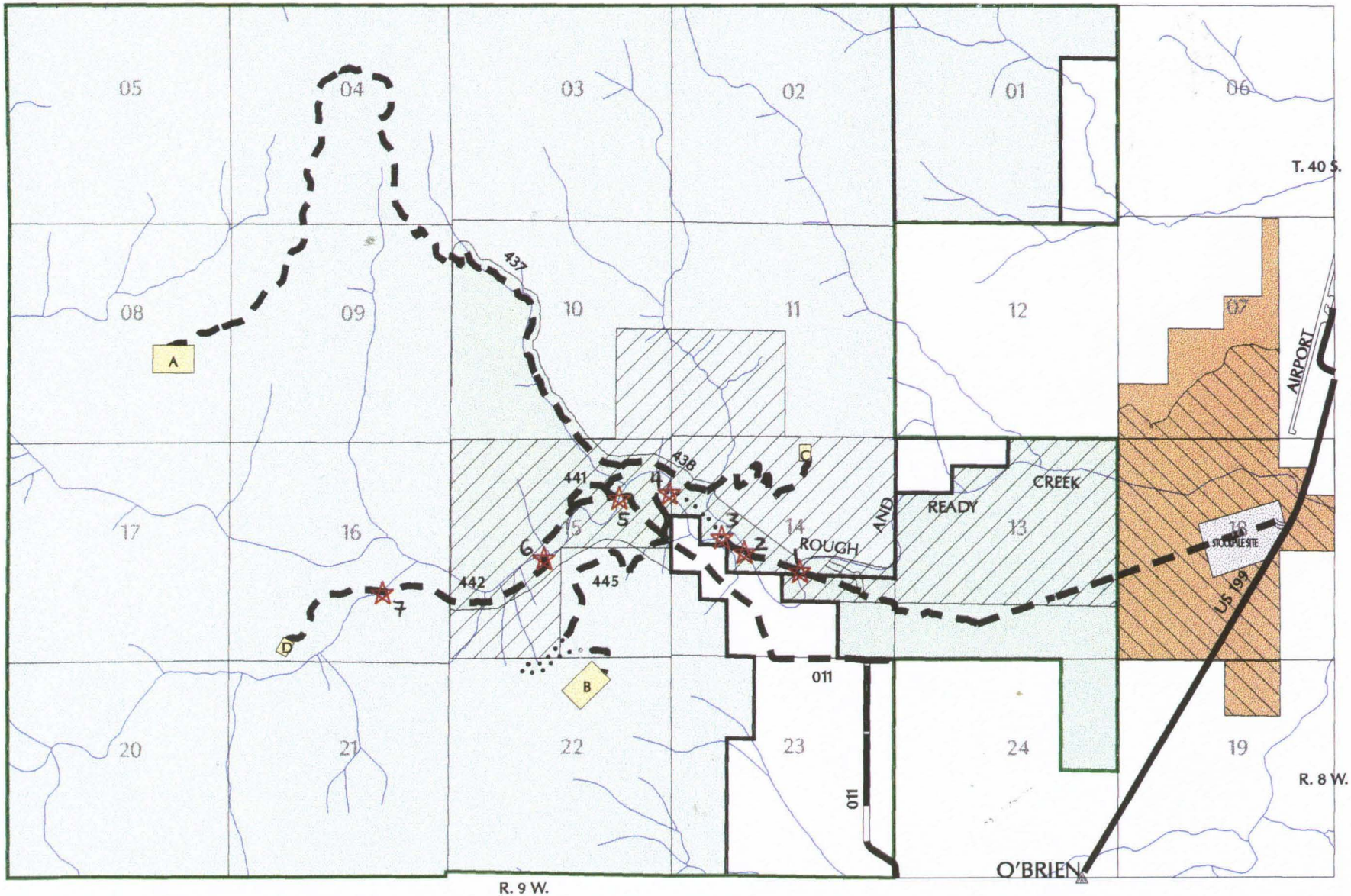


Figure 2

10) The FS, BLM, mine operator and residents would collaborate on transportation safety needs. Stop signs, speed limits, dust abatement, or other traffic control methods may be employed.

11) Dust abatement would be required on portions of the haul route. Several methods of dust abatement may be approved, but water is considered for the purposes of this analysis.

12) Seasonal culverts or bridges would be required at all Rough and Ready Creek (and S. Fork Rough and Ready Creek) crossings. These would be designed to facilitate salmonid migration. All perennial tributary crossings would require temporary culverts to keep trucks from contacting water. Bridges and/or culverts would be placed in creeks on or after June 15 and removed by September 15 annually (to meet project design criteria from the National Marine Fisheries Service). Washed rock, boulder base, culverts, and/or bridges would be stockpiled during the off-season out of the high water channel in a location approved by the FS.

13) Crossing #4 would be eliminated.

14) A full monitoring plan would be developed for the final Plan of Operations. Monitoring would consist of the following Siskiyou National Forest Plan elements:

-GM121 Minerals
-FW121 (a,c) Water Resources
-CF121 Fish Habitat
-CT121 (d) Sensitive Plants
-ET121 (a) Port-Orford-cedar

Baseline water chemistry data is being analyzed by the United States Geological Survey (USGS). This data will be correlated with aquatic insect and macro-invertebrate sampling. The mine operator would be responsible for some ongoing monitoring to assure guidelines are followed. The FS would also provide ongoing minerals administration and compliance reviews.

15) To the extent possible, sensitive plants and unusual habitats would be avoided in final road placement. Off road vehicle use would not be approved. Equipment would be restricted to specified locations.

ALTERNATIVE 1 - Private Road

Alternative 1 is the Proposed Action, modified to require the mine claimant to make a reasonable effort to secure access via the existing private road[5]. ***Figure 4 shows the Alternative 1 haul route.*** For the purposes of this analysis, the private road would be widened and paved to mitigate for noise, dust, and safety[6]. Use of the existing private road would eliminate the need for four crossings of the main stem of Rough and Ready Creek. Seasonal culverts with washed rock surfacing would be required at Crossings #5 and #6, and the South Fork Rough and Ready Creek crossing.

Other Rough and Ready tributary crossings (Alberg Cr., "No Name Cr."[7]) would also use seasonal culverts and washed rock. These culverts and rock would also be removed, stockpiled and replaced annually. The existing road (437) up "Alberg Creek" would be reconstructed, except for 0.86 miles of new construction needed to reroute the road out of the creek bottom. The route to Mine Site B would require 0.25 miles of new construction. About 8.5 miles of reconstruction would be required on portions of all the access roads (including the private land). Total haul route would include about 15.8 miles.

Gates would be placed at Crossing #5 and at the mine site in Section 22. These gates would block all but mining operation and administrative vehicles. Mitigation described in the Proposed Action and additional mitigation included for all action alternatives would apply to Alternative 1.

ALTERNATIVE 2 was dropped from consideration and is discussed later in this chapter.

ALTERNATIVE 3 - Ridge Road Construction

Alternative 3 would modify the Proposed Action to eliminate the need for access via "Alberg Cr." It would construct a new road from Mining Site C to the Mendenhall Fireline (2.2 miles), then follow the fireline to Road 438. Avoiding the Alberg Route would eliminate several tributary crossings. Crossing design would be the same as Alternative 1. Culverts used for stream crossings would be removed and replaced annually. A year-round culvert would be placed over the "Wing and Ferren" ditch (Section 14). Alternative 3 would require 7.26 miles of reconstruction, including portions of all the existing access roads. The road to Mine Site B would require 0.25 miles of new construction. The total haul route would include 15.34 miles of road. Gates would be placed at Crossing #1 and at the mine site in Section 22 to eliminate casual traffic. The mitigation described for the Proposed Action, and the additional mitigation described for all action alternatives would also apply to Alternative 3. ***Figure 5 shows the haul route.***

---

[5]If access cannot be secured by the claimant, the FS would likely have to provide access via federal land.

[6]The Forest Service may choose an alternative that requires the claimant to attempt to secure access through the private land, but does not have the authority to regulate the road design criteria.

[7]"No Name Cr." refers to the unnamed tributary in Section 14.

ALTERNATIVE 4 - Bench and Ridge Road Construction - Preferred

Alternative 4 would eliminate the need for access via "Alberg Cr." It would construct a new road from Mining Site C to the Mendenhall Fireline (2.2 miles), then follow the fireline to Road 438. Two Alberg Creek crossings would be avoided. It would also construct a 0.5 mile full bench road across a steep, rocky slope within Section 14 just northeast of Rough and Ready Creek. Construction of this road would avoid 3 crossings of Rough and Ready Creek (Crossings 1, 5 and 6 and the South Fork Rough and Ready Creek crossing would still be utilized). Crossing design would be the same as Alternative 1. Culverts used for stream crossings would be removed and replaced annually. A year-round culvert would be placed over the "Wing and Ferren" ditch. Alternative 4 would require 7.15 miles of reconstruction, including portions of all the existing access roads. The road to Mine Site B would require 0.25 miles of new construction. Total haul route would include 15.3 miles of road. The mitigation described for the Proposed Action, and the additional mitigation described for all action alternatives would also apply to Alternative. ***Figure 6 shows the haul route.***

ALTERNATIVE 5 - Bridges

Alternative 5 would utilize the same route as the Proposed Action, except that it would avoid Crossing 4 and would reroute the Alberg Road. The existing road (437) up "Alberg Creek" would be reconstructed, except for 0.86 miles of new construction needed to reroute the road out of the creek bottom. The route to Mine Site B would require 0.25 miles of new construction. About 6.37 miles of reconstruction would be required on portions of all the access roads. Alternative 5 would use portable bridges for the five main stem and one South Fork Rough and Ready Creek crossings. The bridges would be removed by September 15 annually and replaced no sooner than June 15 of the following year. A year-round culvert would be placed over the "Wing and Ferren" ditch. The total haul route would include about 14.8 miles. The mitigation described for the Proposed Action, and the additional mitigation described for all action alternatives would also apply to Alternative 5. ***Figure 7 shows the haul route.***

ALTERNATIVES COMPARED

The following two tables (Figures 8 and 9) show the various components included in the Proposed Action and action alternatives, and a comparison of alternatives in terms of the issues described in Chapter One. Chapter Four provides the analytical basis for Figure 9.

	Proposed Action	Alternative 1 - Private	Alternative 3 - Ridge	Alternative 4 - Bench/Ridge	Alternative 5 - Bridge
Number, Type and location of Stream Crossings	16 perennial stream crossings - all low water fords; 7 major, 9 tributary.	7 perennial stream crossings - all culverts; 3 major, 4 tributary.	9 perennial stream crossings - all culverts; 6 major, 3 tributary.	6 perennial stream crossings - all culverts; 4 major, 2 tributary.	11 perennial stream crossings - 6 major with bridges, 5 tributaries with culverts.
Crossing #1	ford	no	culvert	culvert	bridge
Crossing #2, 3	ford	no	culvert	no	bridge
Crossing #4	ford	no	no	no	no
Crossing #5, 6, 7	ford	culvert	culvert	culvert	bridge
Utilizes Existing Private Road	no	yes	no	no	no
Alberg Route	current route	reroute out of stream	abandon route	abandon route	reroute out of stream
Ridge Route	no	no	yes	yes	no
Total Miles of Road Construction	0.55	1.11	2.45	2.58	1.41
Total Miles of Road Reconstruction	7.70	8.51	7.26	7.15	6.37
Stockpile Site	As Proposed.	Alternate Site.	Alternate Site.	Alternate Site.	Alternate Site.
Haul Route	14.30 Miles	15.76 Miles	15.34 Miles	15.28 Miles	14.83 Miles

Figure 8. Alternative Comparison Chart

FIGURE 9A RISK OF SEDIMENT DELIVERY						
	Proposed Action	**No Action**	**Alternative 1- Private**	**Alternative 3 - Ridge**	**Alternative 4 - Bench/Ridge**	**Alternative 5 - Bridge**
Miles of Road Development in Riparian Reserves	5.8 miles total road development, including 0.5 miles new construction.	5.3 miles of low-standard road exists; not all currently driveable.	4.25 miles total road development, including 0.25 miles new construction.	4.1 miles total road development, including 0.1 miles new construction.	4.2 miles total road development, including 0.5 miles new construction.	4.5 miles total road development, including 0.36 miles new construction
Annual Volume Coarse Material Delivered from Crossings (cubic yards)	1100	0	250	400	250	100
Annual Volume Fine Material Delivered from Crossings (cu. yd.)	600	0	100	250	150	50
Sediment Delivery Index (Relative Risk) from Road Construction, Reconstruction	100	SDI has not been calculated. Alberg road and other existing spurs have been continuous source of sediment.	75	15	15	75

FIGURE 9B RISK OF HAZARDOUS MATERIAL SPILL						
	Proposed Action	**No Action**	**Alternative 1- Private**	**Alternative 3 - Ridge**	**Alternative 4 - Bench/Ridge**	**Alternative 5 - Bridge**
Relative Risk Rating based on number and type of crossings	100	Low Current Risk.	30	60	30	60

FIGURE 9C PROPOSED, ENDANGERED, THREATENED, and SENSITIVE (PETS) FISH						
	Proposed Action	**No Action**	**Alternative 1- Private**	**Alternative 3 - Ridge**	**Alternative 4 - Bench/Ridge**	**Alternative 5 - Bridge**
Fish Passage (Physical Barriers)	Fords may limit fish passage to some upstream habitat.	Current condition rated as marginal. Fish passage is limited by 3 diversions.	Fewest crossings, these crossings designed to provide fish passage.	Crossings designed to provide fish passage.	Crossings designed to provides fish passage.	Bridges inherently maintain fish passage.
Sediment Delivery/ Landslide and Erosion Rates	Greatest potential for sediment delivery (see SDI above). Mine Site D may trigger increased erosion rates.	Current condition rated as Optimum.	Potential sediment reduced due to fewer crossings and mitigation. Alberg reroute traverses a talus slope that may fail. Mine site D may trigger increased erosion rates.	Potential sediment delivery reduced due to fewer crossings and mitigation. Mine site D may trigger increased erosion rates.	Potential sediment delivery reduced due to fewer crossings and mitigation. Mine site D may trigger increased erosion rates.	Potential sediment delivery least of action alternatives due to use of temporary bridges. Alberg reroute traverses a talus slope that may fail. Mine site D may trigger increased erosion rates.

FIGURE 9C PROPOSED, ENDANGERED, THREATENED, and SENSITIVE (PETS) FISH						
	Proposed Action	**No Action**	**Alternative 1- Private**	**Alternative 3 - Ridge**	**Alternative 4 - Bench/Ridge**	**Alternative 5 - Bridge**
Large Wood	Increased risk of introduction of POC root disease (Comparative Risk = High) If introduced, disease may degrade future large wood recruitment.	Current condition rated as Marginal because amounts of large wood in the main stem are inherently very low. In tributaries, POC is likely the most important source of large wood.	Increased risk of introduction of POC root disease (Comparative Risk = Moderately High). If introduced, disease may degrade future large wood recruitment.	Increased risk of introduction of POC root disease (Comparative Risk = Moderate). If introduced, disease may degrade future large wood recruitment.	Some increased risk of introduction of POC root disease, however, comparative risk = Low. If introduced, disease may degrade future large wood recruitment.	Increased risk of introduction of POC root disease (Comparative Risk = Moderate). If introduced, disease may degrade future large wood recruitment.
Off Channel Habitat	Off-channel habitat may be degraded further by multiple crossings of No Name Creek and motorized access across its fan.	Off-channel tributary habitats exist at the No Name Creek fan. These have been disturbed by previous mine access.	Maintains current marginal condition of off-channel habitat.	Off-channel habitat may be degraded by multiple crossings of No Name Creek and motorized access across its fan.	Maintains current marginal condition of off-channel habitat.	Off-channel habitat may be disturbed by multiple crossings of No Name Creek and motorized access across its fan.
Streambank Condition	Streambank condition would be degraded at approaches for six main stem crossings and ten tributary crossings.	Existing condition associated with a marginal rating due to existing approaches to at least two main stem low-water fords.	Streambank condition would be degraded at approaches for two main stem crossings and five tributary crossings.	Streambank condition would be degraded at approaches for five main stem crossings and four tributary crossings.	Streambank condition would be degraded at approaches for three main stem crossings and three tributary crossings.	Streambank condition would be degraded at approaches for five main stem crossings and six tributary crossings.

FIGURE 9C PROPOSED, ENDANGERED, THREATENED, and SENSITIVE (PETS) FISH						
	Proposed Action	**No Action**	**Alternative 1- Private**	**Alternative 3 - Ridge**	**Alternative 4 - Bench/Ridge**	**Alternative 5 - Bridge**
Road Density and Location/ Riparian Reserves (also see Figure 9A comparison of miles of road within Riparian Reserves)	Use of Alberg Route and increased road development within riparian reserves. Stockpile site within Riparian Reserves.	Existing condition rated marginal due to low-standard roads within riparian reserves.	Alberg reroute and far fewer main stem crossings may reduce adverse effects but includes many tributary crossings. Stockpile site outside Riparian Reserves.	Abandons Alberg route but high number of main stem stream crossings. Stockpile site outside Riparian Reserves.	Abandons Alberg route and reduces number of main stem and tributary crossings, but adds full bench road within Riparian Reserve. Stockpile site outside Riparian Reserves.	Alberg reroute may reduce adverse effects but includes many main stem and tributary crossings. Stockpile site outside Riparian Reserves.
Human Disturbance History/ Harassment and Incidental Take	Human disturbance would be ongoing for at least ten years. Increased risk of harassment and incidental take.	Past mining has led to an marginal rating for human disturbance. Current risk of harassment low due to minimal access.	Human disturbance would be ongoing for at least ten years. Increased risk of harassment and incidental take.	Human disturbance would be ongoing for at least ten years. Increased risk of harassment and incidental take.	Human disturbance would be ongoing for at least ten years. Increased risk of harassment and incidental take. Direct fish kill may occur with bench road construction.	Human disturbance would be ongoing for at least ten years. Increased risk of harassment and incidental take.

SISKIYOU NATIONAL FOREST - NICORE PROJECT

ALTERNATIVE 5 - BRIDGE

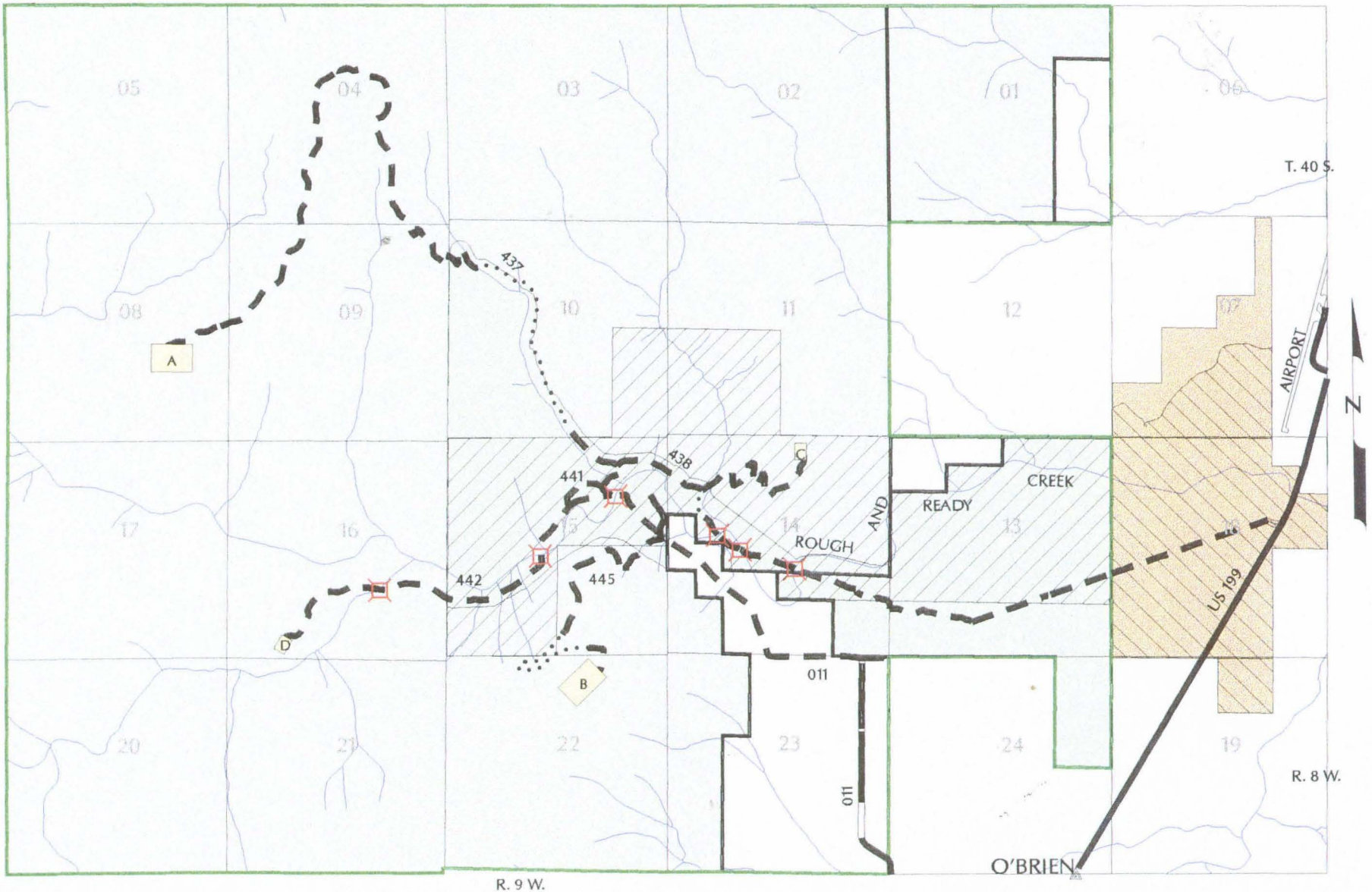


Figure 7

FIGURE 9D PORT-ORFORD-CEDAR ROOT DISEASE						
	Proposed Action	**No Action**	**Alternative 1- Private**	**Alternative 3 - Ridge**	**Alternative 4 - Bench/Ridge**	**Alternative 5 - Bridge**
Comparative Risk	High risk. Access via Alberg Road, no road closures; no POC Disease Containment Strategy.	Low risk. No known infection in analysis area. Current risk of import concentrated on private land and in lower reaches. Private landowner blocks some vehicle access to upper reaches. Area north of creek mostly not accessible.	Moderately High risk. Includes access through private land and via Alberg. Risk decreased from mitigation.	Moderate risk. Avoids 1 stream crossing, avoids private land, avoids access via Alberg; includes mitigation.	Low risk. Avoids many crossings, avoids private land, avoids access to Alberg headwaters, includes mitigation.	Moderate Risk. Includes access via Alberg. Risk decreased from bridges and other mitigation.
FIGURE 9E NOXIOUS WEEDS						
	Proposed Action	**No Action**	**Alternative 1- Private**	**Alternative 3 - Ridge**	**Alternative 4 - Bench/Ridge**	**Alternative 5 - Bridge**
Comparative Risk	Highest risk due to stockpile site near known star thistle, and no mitigation.	Existing star thistle population in lower reaches near proposed stockpile site.	Risk increased by access via private land. Risk decreased from alternate stockpile site and POC Strategy.	Risk increased from ridge road construction. Risk decreased from alternate stockpile site and POC Strategy.	Risk increased from ridge road construction. Risk decreased from alternate stockpile site and POC Strategy.	Risk decreased from alternate stockpile site and POC Strategy.

FIGURE 9F BOTANICAL DIVERSITY/ SENSITIVE PLANTS						
	Proposed Action	**No Action**	**Alternative 1- Private**	**Alternative 3 - Ridge**	**Alternative 4 - Bench/Ridge**	**Alternative 5 - Bridge**
Numbers of Sensitive Species and Sites	14 species, 55 sites potentially impacted.	19 species have been documented within analysis area.	10 species, 45 sites potentially impacted.	14 species, 60 sites potentially impacted.	14 species, 57 sites potentially impacted.	Same as PA.
Miles of Road Development Within Botanical Areas (ACEC and MA-4)	6.8 miles of road development in MA-4 including 0.1 miles new construction. About 0.75 miles road development in ACEC.	7.7 miles of existing road within MA-4 (6.25 on proposed haul route). About 1 mile existing road in ACEC.	5.4 miles of road development in MA-4 including 0.1 miles new construction. About 0.75 miles road development in ACEC.	6.2 miles of road development in MA-4 including 0.2 miles new construction. About 0.75 miles road development in ACEC.	6.5 miles of road development in MA-4 including 0.6 miles new construction. About 0.75 miles road development in ACEC.	6.3 miles of road development in MA-4 including 0.2 miles new construction. About 0.75 miles road development in ACEC.

FIGURE 9F COSTS OF ROAD DEVELOPMENT						
	Proposed Action	**No Action**	**Alternative 1- Private**	**Alternative 3 - Ridge**	**Alternative 4 - Bench/Ridge**	**Alternative 5 - Bridge**
Cost estimate, including construction, reconstruction and crossings.	$625,560	0	$591,370	$608,560	$527,030	$586,970

FIGURE 9G EFFECTS ON RESIDENTS						
	Proposed Action	**No Action**	**Alternative 1- Private**	**Alternative 3 - Ridge**	**Alternative 4 - Bench/Ridge**	**Alternative 5 - Bridge**
Number of residents within 1/4 mile of haul route	5	0	16	5	5	5

FIGURE 9H VISUALS, RECREATION AND INTERPRETIVE DEVELOPMENT						
	Proposed Action	**No Action**	**Alternative 1- Private**	**Alternative 3 - Ridge**	**Alternative 4 - Bench/Ridge**	**Alternative 5 - Bridge**
Comparative Effects	Proposed Action would increase access for recreationists, but could lead to user conflicts. Road development and use likely to reduce scenic quality. Stockpile site may degrade interpretive opportunities.	Most people use lower reaches. Little access to north side of creek in analysis area. Scenic qualities relatively undisturbed. BLM/ Oregon State Pk botanical interpretive trail in the works.	Road closures would reduce user conflicts and maintain current access. Road development and use likely to reduce scenic quality. Alternative stockpile site would minimize adverse effects on interpretive opportunities.	Road closures would reduce user conflicts and maintain current access. Road development and use likely to reduce scenic quality. Ridge road may be visible to neighbors. Alternative stockpile site would minimize adverse effects on interpretive opportunities.	Road closures would reduce user conflicts and maintain current access. Road development and use likely to reduce scenic quality. Ridge road may be visible to neighbors. Bench road would be obvious to neighbors and others. Alternative stockpile site would minimize adverse effects on interpretive opportunities.	Road closures would reduce user conflicts and maintain current access. Road development and use likely to reduce scenic quality. Alternative stockpile site would minimize adverse effects on interpretive opportunities.

Figure 2A

SISKIYOU NATIONAL FOREST - NICORE PROJECT

LEGEND FOR ALTERNATIVE MAPS

Note: Not all legend items are on map


National Forest Lands


National Forest - Inventoried Roadless Area


Bureau of Land Mgmt


State and Private Lands


Mine Site


Stockpile Site


USFS Botanical Area


BLM Area of Critical Environmental Concern


Project Area


Forest Boundary


Streams


Section Lines


US 199


Paved Road


Gravel Road


Low Standard Road, Currently Driveable


Portions Need Reconstructed To Be Driveable


Roads Not Classified


New Road Construction


City of O'Brien


Proposed Ford R&R Crossing


Proposed Culvert R&R Crossing


Proposed Bridge R&R Crossing

ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

Several alternatives considered during this analysis were subsequently dropped from detailed study.

Alternative 2

An alternative that accessed mine site B from the 4402 (Wimer) Road to the south was considered but eliminated from detailed study because it did not effectively resolve any issues with the Proposed Action. It would have only applied to access of one site, and would have disturbed another botanical area and a potential cultural site. It also would have increased the risk of spreading Port-Orford-cedar root disease.

An Alternative that would withdraw the some or all of Rough and Ready Creek watershed from mineral entry.

An alternative that would have recommended that some or all of Rough and Ready Creek watershed be withdrawn from mineral entry was suggested by several commenters, and considered by the FS and BLM. Federal agencies may apply for administrative withdrawals given a wide range of "public purposes"[8]. The FS and/or BLM could recommend withdrawal based on the area's environmental sensitivity. However, such a recommendation would not meet the Purpose and Need for Action[9] as stated in Chapter One, and would be outside the scope of project level analysis. A withdrawal would not affect valid, existing claims. A mineral discovery is assumed valid until otherwise proven. Therefore, analysis of the proposed Plan of Operation would still be required in the near term. Details about the withdrawal and validity examination process are in the project files.

An Alternative that completely relocates the road system to "better" locations.

Several transportation system options exist in the analysis area. Specific routes that were suggested by the public were considered. Several criteria were used to evaluate access options;

1) no new road construction within areas eligible for Wild River Classification under the Wild and Scenic River Act;
2) minimize new stream crossings and road development within the Roadless Area;
3) minimize road development in the FS Botanical Area;
4) meet other road design criteria (see access documentation in the analysis file).

Access options that did not meet the criteria were not considered in detail.

---

[8]See BLM manual supplement 2310 and FS manual 2700-90-1. The BLM is responsible for processing all withdrawal requests.

[9]Purpose - to determine reasonable mitigation, Need - to respond to a claimant's Plan of Operations.

An Alternative that eliminates all road improvement and requires helicopter access

An alternative that eliminates all road improvement and requires access from the air was considered but eliminated from detailed study. Such an alternative would be extremely expensive to implement and would be tantamount to denial of access.

An Alternative that "buys out" the claims

Some people suggested that the agencies purchase the claims. Such an alternative would not meet the Purpose and Need as described in Chapter One (see footnote 9). The Forest Service policy does not allow purchase of unpatented claims.

An Alternative that would import off-site fill and/or soil to assure revegetation of mine pits

Use of off-site materials (fill and topsoil) to assure revegetation of mine pits was considered. Potential adverse effects of use of such materials are likely to be greater than the benefits of using them. Import of soil might require more round trips along the access route and attendant crossings of Rough and Ready Creek. Imported material would have an increased risk of spread of noxious weeds or non-native vegetation.

CHAPTER THREE
AFFECTED ENVIRONMENT

This chapter briefly describes the environmental components that might be affected by the Nicore project. It forms the basis for the Environmental Consequences of the No Action Alternative. The focus of this chapter is on significant issues as discussed in Chapter Two, however some discussion about other resources that might be affected is included. Discussions from previous analysis efforts are summarized and incorporated by reference, including the West Fork Watershed Analysis, the Rough and Ready Wild and Scenic River Eligibility Study, Siskiyou and Northwest Forest Plan and associated documents, BLM Resource Management Plan and associated documents, Draft BLM Area of Critical Environmental Concern Management Plan and associated documents, Draft Management Plans for various sensitive plants, State Plans for Anadromous Fish restoration, and other documents.

PHYSICAL ENVIRONMENT

The physical setting of Rough and Ready Creek watershed is described at length within the West Fork Watershed Analysis and the Rough and Ready Creek Wild and Scenic Eligibility Study (available in the Analysis files). Most of the analysis area is within the Rough and Ready Watershed. The nickel laterite soils are located on flat ridges of ultramafic rocks and on older weathered soils on the alluvial fans. Soils in the vicinity of the mine sites are mapped as 20 to over 60 inches deep (average depth of the laterite deposits themselves is 12 feet). The deposits that would be mined in this project are shown on the Alternative Maps in Chapter Two. A map of additional laterite deposits is in the analysis file.

Rough and Ready Creek is noted for its unusual channel morphology and large substrate in its lower gradient, unrestricted reaches. The alluvial fan at the mouth of Rough and Ready Creek is unique for a stream of this size within the Klamath Province. Thus, the geological/hydrological character of the main stem is considered an Outstandingly Remarkable Value.

AQUATIC ENVIRONMENT

Water Quality

Water Clarity - The abundance of shallow, rocky soils and rock outcrops, and the low amount of ground disturbing activities contribute to excellent water clarity. However, when sites with deeper soils and higher clay contents are disturbed, fine sediment may be delivered to Rough and Ready Creek. Fine sediment added to streams can increase turbidity. The amount of sediment moving through the system at Crossing #4 was modeled as 1,850 cubic yards of material per day, with an average size of 3.2 inches diameter.

Domestic Use - Residents within the analysis area drink water from the creek, either directly or via ditch recharge of shallow wells. One withdrawal for domestic use is filed with the State Watermaster.

Water Temperature - Rough and Ready Creek, as a major tributary to the West Fork Illinois River, is considered Water Quality Limited by Oregon State Department of Environmental Quality, because of high summer water temperature. Water temperatures exceeding 80 degrees have been measured within the analysis area during low flow. High water temperatures are inherent to the watershed, although the condition may be exacerbated by water withdrawal.
Water Quantity - Low flow was measured as 8 cubic feet per second one day on the main stem of Rough and Ready Creek above all diversions. As the creek moves downstream, it loses flow to diversions and the subsurface. In places, it almost runs dry during the summer and early fall.

PROPOSED, ENDANGERED, THREATENED and SENSITIVE FISH SPECIES

Native Salmonid Fish Distribution

Native salmonids potentially present within the analysis area include: resident rainbow and cutthroat trout; and anadromous winter steelhead trout, fall chinook salmon, and coho salmon.

Resident rainbow and cutthroat trout also occur throughout Rough and Ready Creek and its tributaries. Both the North and South Forks are likely more significant spawning and rearing sites than the main stem.

Winter steelhead trout spawn and rear throughout most of Rough and Ready Creek and many of the tributaries. Observations during summer 1997 identified low to moderate concentrations of juveniles at the proposed creek crossing sites and throughout the lower reaches of the creek. Riffles near the crossings appear to rear greater numbers of juvenile steelhead than adjacent pool habitats, presumably because oxygen levels are higher in these riffle habitats.

Fall chinook salmon are less likely than steelhead to spawn and rear on Rough and Ready Creek. Habitat on the West Fork of the Illinois River, immediately adjacent to Rough and Ready Creek, is currently classified as High Value Native Fall Chinook Salmon Habitat by the State of Oregon.

Coho salmon are potentially present in the analysis area, however surveys have not documented the presence of adult or juvenile coho within the Rough and Ready watershed. The area has not been identified as critical or high value habitat for coho.

Proposed, Endangered, Threatened, or Sensitive Species (PETS)

Coho salmon are listed as threatened under the Endangered Species Act. Steelhead trout are proposed for listing. FS Region Six sensitive species include chinook salmon and cutthroat trout. Rough and Ready Creek does not inherently provide high quality habitat for any of these species. Cool springs and a few deep pools provide some potential refugia for fish, but the high temperatures, low flows and seasonal barriers to juvenile salmonid migration from dams and diversions make Rough and Ready Creek a relatively inhospitable environment for anadromous fish.

Figure 10 describes existing fish habitat conditions within the lower reaches of Rough and Ready Creek. The definitions of "optimum", "marginal" and "outside optimum range" were established for the Klamath/Siskiyou Mountains, but have not been adapted to serpentine environments. Criteria for optimum vs. outside optimum range is available in the Fish, Wildlife, and Aquatic Conservation Strategy Evaluation in the analysis file.

Factors and Indicators	Lower Rough and Ready Creek Reach (Response Reach)		
	Optimum	Marginal	Outside Optimum Range
Temperature			x
Physical Barriers		x	
Sediment	x		
Large Wood		x	
Pool Character and Quality		x	
Off-channel Habitat		x	
Width/depth ratios		x	
Stream-bank Condition		x	
Floodplain Connectivity		x	
Changes in peak flows	x		
Road Density / Location		x	
Human Disturbance History		x	
Riparian Reserves		x	
Landslide and Erosion Rates	x		
Harassment or Incidental Take	x		

Figure 10. Matrix of Factors and Indicators - Existing Condition

PORT-ORFORD-CEDAR ROOT DISEASE

Port-Orford-cedar (POC) is a conifer endemic to southwestern Oregon and northwestern California. POC occupies a variety of ecological zones; moist areas are favored, but it also grows on dry sites. *Phytophthora lateralis* (POC root disease) was first encountered on POC in nursery stock in Seattle, Washington, in 1923. It has now spread to about seven percent of the area occupied by POC on National Forest; disease centers are scattered throughout the northern half of the natural range of POC. High risk areas for infestation are stream courses, drainages, or low-lying areas downslope from infestation centers. Long distance spread of the disease pathogen has occurred through earth movement in road construction, road maintenance, logging, and traffic flow on forest roads. Road use during wet periods is associated with high risk. Movement of the pathogen in soil clinging to the feet of cattle and elk has also been documented. Topography has a considerable influence on spread; concave areas with POC are especially vulnerable because they are easily flooded.

Within the analysis area, POC is generally found in riparian areas, including small seeps, and is often the primary riparian component. The larger POC are 20 to 40 inches in diameter and are 200 to 400 years old. The West Fork Watershed Analysis includes a map of POC and root disease distribution within the watershed. Root disease has not been found in the analysis area[1]. Two possible explanations for the lack of root disease to date are:

(1) Limited Access - the area is generally inaccessible to motorized traffic, especially during the wet season;

(2) Gaps in POC distribution inhibit the spread.

NOXIOUS WEEDS

Serpentine-dominated landscapes are inhospitable to many plants, including noxious weeds. However, a few non-native species can grow on serpentine, and in some cases, can out-compete native vegetation. Known noxious weeds species within the analysis area include Scotch broom (*Cytisus scoparius*), yellow star thistle (*Centaurea solstitialis)* and Himalayan blackberry *(Rubus discolor)*. Star thistle is the primary noxious weed species of concern because of its current presence near Highway 199 and its ability to spread aggressively. Star thistle can out-compete native plants on dry, harsh, or disturbed sites. Disturbed areas along the highway and along roads are most susceptible.

---

[1]Two concentrations of dead trees along Rough and Ready Creek were investigated, but root disease was not found. The trees may have been damaged by flathead borers (found on site) and/or high water.

Botanical area management emphasizes controlling noxious weeds. The Illinois Valley Garden Club and other groups have spearheaded efforts to eradicate star thistle from the Botanical Wayside (hand pulling). Their efforts have been successful, and the population appears to be diminishing. The current risk of spread is high within the BLM ACEC, along the power line and other roads in the analysis area. Areas commonly accessed by the public, such as the "Mars" swimming hole, are at risk of establishment of star thistle and other noxious weeds.

BOTANICAL DIVERSITY AND SENSITIVE PLANTS

The analysis area is renowned for its botanical diversity and abundance of rare plant species. The low calcium, high magnesium, and the high metal concentrations in serpentine soils result in conditions toxic to many common species. Some species have developed mechanisms to deal with these conditions; serpentine endemics are species found *only* within serpentine habitats. The highest concentrations of rare plants within the analysis area are found on rocky slopes, wet areas, alluvial flats, and Jeffrey pine savannah habitats.

The haul route common to all action alternatives traverses the BLM Area of Critical Environmental Concern (ACEC) and FS Botanical Area. These areas comprise about 2500 acres within the analysis area. The botanical resources are also recognized as an Outstandingly Remarkable Value (ORV) within the Rough and Ready Creek corridor. The presence of many rare and endemic plant species throughout the analysis area has been documented in the following reports:

*Appendix F of the Siskiyou National Forest Plan FEIS includes a description of the Rough and Ready Botanical Area.

*A Preliminary Flora for the Rough and Ready Creek watershed (Borgias 1994) included 278 species.

*The 1993 Rough and Ready Wild and Scenic River Eligibility Study includes known and potential plant lists.

*The Oregon Natural Heritage Program (ONHP) maintains a database of known rare plant habitats and sites. This database has been updated to include plant surveys accomplished in 1997.

*The West Fork Watershed Analysis discusses 45 Siskiyou endemics found within the West Fork watershed, many of which also grow in the analysis area.

The analysis within this EIS focuses on the rarest species within the analysis area; these are FS Region 6 "Sensitive" and BLM "Special Status" species. Nineteen such species have been documented within the analysis area, fourteen of which are within 100 feet of proposed haul routes or mine sites. Additional species of concern are BLM Tracking Species and FS Watch Species. Information about the tracking and watch species is available in the analysis file. Figure 11 provides FS documented plant sitings within the analysis area. **Highlighted** species are those on ONHP "List 1", which are species of their greatest concern. Only a small portion of the analysis area has been formally surveyed (along all existing and proposed roads, except the bench road and new construction on the route to Mine Site B).

Township, Range and Section Number		Rare Plant Species and Year Documented
T40S, R8W Section	06	**Microseris howellii** (MIHO) 1940
	18	MIHO 1997
		Mimulus douglasii (MIDO) 1997
T40S, R9W Section	01	**Hastingsia bracteosa** (HABR2) 1995 (***NOT FOUND IN 1997***)
		Calochortus howellii (CAHO3) 1995
		Senecio hesperidum (SEHE) 1995
		MIHO 1995
	02	Cardamine nuttallii var. gematta (CANUG) 1997
		MIHO 1997
	03	Fritillaria glauca (FRGL2) 1997
		Arabis "macdonaldiana" (ARMC) 1997
		CANUG 1997
	04	CAHO3 1997
		CANUG 1997
	08	**Streptanthus howellii** (STHO) 1997
	10	STHO 1997
	11	SEHE 1997
		MIHO 1997
		CAHO3 1997
		STHO 1997
T40S, R9W Section	13	**Limnathus gracilis var. gracilis** (LIGR3) 1939 (*NOT FOUND IN 1997)*
		CAHO3 1997
		MIHO 1997
	14	ARMC 1997
		MIHO 1997
		CAHO3 1997
		FRGL2 1997
		SEHE 1997
		Perideridia erythorhiza (PEER) 1997
		Epilobium rigidum (EPRI) 1997
		Viola primulifolia ssp. occidentalis (VIPRO) 1997
		Salix delnortensis (SADE2) 1997
		Mondardella purpurea (MOPU2) 1997
		Epilobium oreganum (EPOR) 1997
	15	STHO 1997
		HABR2 1989
		MIHO 1997
		CAHO3 1997
		MOPU2 1997
		SEHE 1997
		EPRI 1997
		Hieracium bolanderi (HIBO) 1997
		SADE2 1997
	16	SADE2 1991, 1997
		MIHO 1997
		SEHE 1997
		STHO 1997
		MOPU2 1997
		CAHO3 1997
		Poa piperi (POPI) 1997
		Epilobium rigidum (EPRI) 1997
	22	STHO (multiple sites, date unknown)

Figure 11. Known sensitive plants within the analysis area.

Draft species management guides have been prepared for six of the sensitive species:

Calochortus howellii, *Epilobium oreganum*, *Monardella purpurea*, *Senecio hesperius*, *Microseris howellii*, and *Hastingsia bracteosa*. A Draft Fen Conservation Agreement analysis area, but is not on the proposed haul route. In addition, the BLM is preparing a Draft Management Plan for the Area of Critical Environmental Concern. At press time, the BLM had not released its Draft Plan.

The West Fork Watershed Analysis, the Southwestern Oregon LSR Assessment, the Siskiyou National Forest Plan FEIS and Medford BLM District Resource Management Plan address vegetative conditions (plant associations, seral stages and density) across serpentine habitats. Discussions in those documents will not be repeated here. In addition, known Survey and Manage (see the Northwest Forest Plan) plant sites were considered. The only known sites are of a lichen, *Bryoria tortusa*, within the Rough and Ready Area of Critical Environmental Concern.

SOCIAL SETTING

About 1,000 acres within the analysis area are privately owned. The private land is generally residential and small wood lot, except for the land along Highway 199, which has been developed for industrial and commercial enterprises such as Rough and Ready Lumber Mill and the Illinois Valley Airport. The mill and airport has operated 24 hours/day from time-to-time. Both have noises, lights, and odors associated with their operations that can carry throughout the local valley. Within the analysis area, State and County road access is limited to Highway 199, Airport Drive, and Naue Way. These roads receive frequent use by all kinds of traffic including heavy trucks and equipment. Some roads within the analysis area traverse private land and use is restricted by the landowner(s). People living along Rough and Ready Creek Road enjoy a sense of solitude because of the restricted access.

Development of an interpretive trail within the Oregon State Botanical Wayside and BLM ACEC is in the works. The trail is sponsored by community groups and agencies, including the Illinois Valley Community Response Team (CRT), Garden Club, BLM and Oregon State Parks. The site is considered part of the overall strategy for economic development in the CRT Illinois Valley Strategic Plan.

Recreation within the analysis area includes swimming, botanical exploration, hiking, and horseback riding. Most use occurs in the lower reaches of Rough and Ready Creek that are currently accessible to motorized vehicles.

ROADLESS CHARACTER

About 60 percent of the analysis area are associated with "roadless character," a wild or primitive environment that is not readily accessible by road. Roadless character is valued by many people for its lack of human intrusion and opportunities for solitude. The area described as the South Kalmiopsis Roadless Area (SK) in Appendix C of the Siskiyou National Forest Plan does not necessarily possess roadless character, and there may be lands that possess this character that are not within the Appendix C boundary. Still, the Forest Plan inventoried roadless area description provides a useful baseline for roadless character effects analysis. The portion of the SK within the analysis area is consistent with the roadless area description in the Forest Plan.

Most road development within the area had occurred prior to the Forest Plan analysis. The development of mining roads likely had significant effects on roadless character when they were built. Inspiration Mining Company extensively sampled the analysis area in the 1970's; the current transportation system within the SK was built to facilitate their explorations.

The SK portion of the analysis area has had infrequent, low intensity disturbance from mining exploration, administrative use (to access the Mendenhall Fire, for example), and recreation. About 13 miles of low standard road currently exist within the SK portion of the analysis area. Most of these roads would not be driveable without some repair.

A roadless area study to consider additions to the Kalmiopsis Wilderness was initiated in the early 1970's, and again in the 1980's. The 1984 Oregon Wilderness Act did not add the analysis area to the Wilderness. The Siskiyou Forest Plan allocated these areas to non-Wilderness uses, including Administrative Study and Botanical Area.

AQUATIC CONSERVATION STRATEGY

The Aquatic Conservation Strategy is a four-pronged approach to maintenance of the natural disturbance regime relative to riparian and aquatic ecosystems. Components of the Aquatic Conservation Strategy include the Riparian Reserve, Key Watersheds, Watershed Analysis, and Watershed Restoration.

Riparian Reserves - Riparian Reserves within the analysis area include: fish-bearing streams, permanently flowing non-fish-bearing streams, seasonally flowing or intermittent streams, wetlands less than 1 acre, constructed ponds and/or wetlands greater than 1 acre (i.e., water diversion ditches, etc.). The characteristics of riparian habitat within serpentine landscapes is displayed in Figure 12.

Key Watersheds - Neither Rough and Ready Creek nor the West Fork of the Illinois River was identified as a Key Watershed in the Northwest Forest Plan.

Watershed Analysis - Rough and Ready Creek was included in the recent West Fork of the Illinois River Watershed Analysis (1997).

Watershed Restoration - Rough and Ready Creek is not presently identified as either a Key Watershed (FS/BLM) or Coastal Salmon Recovery Initiative Core Area (Oregon Department of Fish and Wildlife - ODFW). Therefore, watershed restoration opportunities are a lower priority than others with these designations. However, watershed restoration opportunities were identified for this watershed in the recent West Fork Watershed Analysis.

CHARACTERISTICS OF RIPARIAN HABITAT AND ITS FUNCTION WITHIN SERPENTINE ENVIRONMENTS	
	SERPENTINE HABITAT
Stream Morphology/ Substrate	High energy system with cobble substrate, rock weathers directly to silt and clay leaving a lack of sands and gravel.
Riparian Zone	Riparian zone very narrow. Riparian vegetation sometimes limited to plants with roots in the creek, rarely extends further than 20 feet from the active channel.
Late-Successional Conditions	May not be capable of providing high quality late-successional habitat (e.g. for species such as spotted owl).
Shade-Producing Vegetation	Trees are larger in narrow riparian zones than surrounding vegetation, but rarely exceed 36" dbh. Stand density generally not capable of exceeding 70% canopy cover; often less than 40%. Port-Orford-cedar is primary source of shade.
Large Wood	Riparian zones not capable of providing ready source of large wood to stream system. Large wood delivered to streams quickly flushed through system.
Intermittent Streams	High proportion of landmass consisting of intermittent Riparian Reserves. Intermittent streams flow during a shorter period of the year. Vegetation alongside intermittent channels varies little from upland conditions.
Perennial Springs and Seeps	Water emerges from bedrock shear zones on slopes and streambanks.
Rare Plant Species	Many rare species are related to riparian habitats, including fens, vernal pools, and seeps.
Response to Disturbance	Revegetation following disturbance slow to become established. Gullies are long lasting.

FIGURE 12. Riparian Characteristics within the Analysis Area.

WILD AND SCENIC RIVER ELIGIBILITY AND OUTSTANDINGLY REMARKABLE VALUES

Rough and Ready Creek was considered for its Eligibility for Wild and Scenic (W&S) River status. Portions of the creek were found eligible in 1993. The Outstandingly Remarkable Values (ORV's) include botanical, hydrological/geological, and wildlife. These values and the potential classification of various segments of the creek are described in the Wild and Scenic River Eligibility Study in the project file. The next step in the process is a study to determine whether the creek is suitable for inclusion into the W&S River System. The US Congress makes the ultimate decision whether or not to include the river in the system. The suitability recommendation is normally one of the outcomes of a Forest Plan Revision. Until such time that the creek is found not suitable, it will be managed to protect its free-flowing characteristics, potential classification (Wild, Scenic or Recreational) and ORVs.

CHAPTER FOUR - ENVIRONMENTAL CONSEQUENCES

Chapter Four discusses the analytical basis for the alternative comparison shown in Chapter Two (Figure 9). The primary focus of this chapter is the effects on the issues described in Chapter One. This chapter also includes brief discussions about non-significant effects, issues that could not be analyzed, and specifically required disclosures.

RISK OF SEDIMENT DELIVERY

Sediment from Stream Crossings

Rough and Ready Creek would be exposed to increased sediment at the stream crossings where road fill would be placed within the winter flow channel. In the Proposed Action and Alternatives 1, 3, and 4, the surface of the fills would consist of crushed rock smaller than 3 inches in diameter (average size is 1.5 inches). Fines would be washed away prior to use of the material (hence the name "washed rock"). Road design specifications would ensure that no more than 35% of the material would degrade into fines.

For the Proposed Action (PA), fill placed at seven crossings would be allowed to wash out during winter high flows. An estimated ***1,100 cubic yards*** of coarse sediment would be integrated into the bedload. This amount would be added annually through the ten years of operation. ***About 600 cubic yards*** (35% of total amount added at crossings) of fine sediment may also be added to the system as the coarse grained material degrades. The fine sediment may be transported a short distance downstream throughout the operating season, and would likely be flushed out of the system during higher flows. The fine material is expected to have a very low clay content and would settle out of the water column rapidly. State water quality standards may be exceeded for a short duration and distance downstream.

Alternatives 1, 3, and 4 would reduce the amount of coarse and fine sediment as compared to the Proposed Action. These alternatives use fewer crossings, and the coarse material would be removed annually. However, some coarse material would likely remain in the system. This analysis estimates that about half the fine material created at the crossings would be delivered to the stream. The annual coarse sediment estimates for these alternatives are: ***250, 400 and 250 cubic yards***, respectively. Annual fine sediment estimates are ***100, 250, and 150 cubic yards*** respectively.

Alternative 5 would introduce the least amount of sediment from the crossings because of the use of bridges. About ***100 cubic yards*** of coarse sediment and ***50 cubic yards*** of fine sediment are estimated as annual sediment delivery under this alternative.

Please see the Alternative Comparison Chart in Chapter Two for numbers of stream crossings included within the Proposed Action and action alternatives.

The No Action Alternative would not add new sediment to the crossings. The amount of coarse sediment that is transported through the system at high flow was estimated for Crossing #4. Under the current condition, about ***1,850 cubic yards*** of material (average size 3.2 inches/83 mm in diameter) moves through this area daily. Use of existing low water fords would contribute to local, infrequent episodes of turbidity by stirring up the streambed at the crossing.

Sediment from Road Development

The alternatives differ in terms of the amount of road development within Riparian Reserves and potential sediment delivered. Newly disturbed soils along roads can erode and deliver fine sediment to stream channels. The effects to water quality vary with the amount of disturbance, slope or grade of the road segment, clay content of the disturbed soils, and proximity to a stream channel. The greatest risk of sediment delivery is from the Alberg Road. The Alberg Road exceeds a 20 percent grade in places and traverses an area of higher clay content. The Alberg reroute moves some of the road out of the Riparian Reserve and avoids some stream crossings, but crosses a steep, serpentinite debris slide. Buttressing may be needed to stabilize this exposure. The route to site B, included in all action alternatives, also includes steep grades relatively near a creek. The No Action Alternative would continue to deliver some sediment from these existing roads.

The amount of road development and new construction within Riparian Reserves and relative risk rating for sediment delivery is displayed in Figure 13. The relative risk rating considers that Alternatives 1, 3, 4 and 5 include mitigation measures described in Chapter Two. The use of Best Management Practices and Road Design Criteria (documented in the analysis files) are essential to reduce the amount of sediment delivered to Rough and Ready Creek from road projects.

	Proposed Action	Alt 1	Alt 3	Alt 4	Alt 5
Miles of New Road Construction in Riparian Reserves	0.5	0.25	0.1	0.5	0.36
Miles of Road Reconstruction in Riparian Reserves	5.3	4.0	4.0	3.7	4.1
Relative Sediment Risk Rating	100	75	15	15	75

Figure 13. Miles of Road Construction and Reconstruction within Riparian Reserves and Relative Sediment Risk Rating.

The relative sediment risk rating compares the alternatives to one another, and has no absolute value. The Proposed Action was given an arbitrary value of 100, and all alternatives are compared to this value. It is based on the location (proximity to streams), grade, and amount of proposed road development. The use of the Alberg Route in the Proposed Action and Alternatives 1 and 5 contribute to the higher risk ratings. The bench road included in Alternative 4 would not likely be a continual sediment source, since it would be constructed on bedrock. However, some large angular rock fragments could be delivered to the creek during construction.

Mine Site Stability

Three of the four mine sites are located on flat ridges and are not prone to erosion. Mine Site D is on a hillslope above the South Fork of Rough and Ready Creek. Ponding of water in the mine pit may lead to changes in subsurface drainage and instability. The operator will be required to provide adequate drainage control in the final Plan of Operations.

Indirect and Cumulative Effects

Accelerated sediment delivery can have adverse effects on many beneficial uses, including domestic water quality, visuals, and fish habitat. Sediment delivery from the alternatives is not likely to significantly degrade drinking water quality or visuals. The main stem of Rough and Ready Creek is noted for its unique geology, which is considered an Outstandingly Remarkable Value (ORV). The increased sediment associated with all action alternatives is not likely to degrade this ORV. However, the Proposed Action and all action alternatives may result in fine sediment delivery that could degrade summer rearing and/or fall spawning habitat (see detailed discussion about Fish later in this chapter). Mitigation described in Chapter Two would reduce fine sediment.

Past activities within the Rough and Ready Watershed have likely resulted in some accelerated sediment delivery. The amount of sediment or site-specific effects are not known. The amount of coarse material deposited in the braided channels and broad alluvial flats is inherently high. The current situation is considered optimum in terms of sediment regime (see Chapter Three, Figure 10 in the PETS Fish section).

No other proposed projects that might contribute significant volumes of sediment are currently proposed in the watershed.

RISK OF HAZARDOUS MATERIAL SPILL

The Rough and Ready stream crossings are associated with a low risk of introducing hazardous materials into the stream. The primary risk would be at stream crossings, and varies with the amount and type of crossings. The No Action alternative is associated with little risk due to the low amount of current use.

Relative hazardous material spill risk ratings for the Proposed Action and action alternatives are shown in Figure 14. The relative risk rating compares the alternatives to one another, and has no absolute value. It is based on the number and type of stream crossings, with the Proposed Action given an arbitrary value of 100. The operator will be required to include a spill, and fuel storage and transportation plan in the final Plan of Operations.

	PA	Alternative 1	Alt 3	Alt 4	Alt 5
Relative Risk of Spill	100	30	60	30	60

Figure 14. Relative Risk Rating for Hazardous Material Spill

The ore is not expected to contain toxic materials. Hazardous fluids that may be spilled include oil, gas, and hydraulic fluid. Fuel storage would be outside of Riparian Reserves in all action alternatives.

Indirect and Cumulative Effects

The consequences of a hazardous material spill are serious, particularly because people drink water directly or indirectly (via shallow wells) from the stream. Proposed, sensitive, and/or listed (threatened) fish may be killed by a major spill. Water quality may be degraded to the point where it would be unhealthy to drink. No other activities that could increase the risk of hazardous material spill are known in the analysis area.

PROPOSED, ENDANGERED, THREATENED and SENSITIVE (PETS) FISH SPECIES

Figure 15 displays potential effects of the Proposed Action and its alternatives on the Fish Habitat Indicators discussed in Chapter Three. Narrative discussions about the factors that may be degraded by any alternatives follows.

Factors Indicators	Lower Rough and Ready Creek Reach (Response Reach)			Effects of the Proposed Action, Action Alternatives, and the No Action Alternative		
	Optimum	Marginal	Outside Optimum Range	Restore	Maintain	Degrade
Water Quality Temperature			x		PA, 1, 3, 4, 5, NA	
Habitat Access Physical Barriers		x			1, 3, 4, 5, NA	PA
Habitat Elements						
Sediment	x				NA	PA, 1, 3, 4, 5
Large Wood		x			NA	PA, 1, 3, 4, 5
Pool Character and Quality		x			PA, 1, 3, 4, 5, NA	
Off-channel Habitat		x			1, 4, NA	PA, 3, 5
Channel Conditions and Dynamics						
Width/depth ratios		x			PA, 1, 3, 4, 5, NA	
Stream-bank Condition		x			1, NA	PA, 3, 4, 5
Floodplain Connectivity		x			PA, 1, 3, 4, 5, NA	
Flow/Hydrology Changes in peak flows	x				PA, 1, 3, 4, 5, NA	
Watershed Conditions						
Road Density / Location		x			NA	PA, 1, 3, 4, 5
Human Disturbance History		x			NA	PA, 1, 3, 4, 5, NA
Riparian Reserves		x			NA	PA, 1, 3, 4, 5
Landslide and Erosion Rates	x				NA	PA, 1, 3, 4, 5
Harassment or Incidental Take	x				NA	PA, 1, 3, 4, 5

Figure 15. Matrix of Factors and Indicators

Habitat Access - The Proposed Action may impede fish passage at main stem and South Fork Rough and Ready Creek crossings during low flows, thus the "degrade" rating. The action alternatives may have a minor adverse effect on fish passage, but are not expected to result in a degraded situation. The No Action Alternative is not likely to have any effect on fish passage.

Sediment Regime - The previous discussion on sediment reveals that all action alternatives may increase the risk of fine sediment reaching the main channel of Rough and Ready Creek and that some of the risk may be mitigated. Fine sediment delivery can reduce overall carrying capacity in the immediate vicinity of the proposed stream crossings, relative to both summer rearing and fall spawning habitat. Chinook salmon that may spawn immediately downstream of the proposed crossings may suffer from increased fines covering nests. At these sites, intra-gravel fines may be increased greater than 20 percent above existing background prior or just after fall spawning (see S&G 11-3 in the Siskiyou National Forest Plan). Steelhead, spawning much later in the season, are not likely to be adversely affected by this sediment.

Large Wood - No significant direct effects on large wood would be expected from the alternatives. However, the risk of introducing POC root disease into the analysis area is increased in the Proposed Action and action alternatives. POC may provide the primary contribution of large wood to Alberg and No Name Creeks. If root disease is introduced into these areas, the supply of large wood to the creeks would eventually become degraded.

Off Channel Habitat - The Proposed Action and Alternatives 3 and 5 could potentially degrade off channel tributary habitats adjacent to the confluence of No Name Creek and the main stem of Rough and Ready Creek. Alternatives 1 and 4 and the No Action Alternative are expected to maintain these habitats.

Stream Bank Condition - The Proposed Action and all action alternatives have the potential to degrade stream bank conditions at the proposed stream crossings through loss of vegetation, disruption of streamside springs, and bank erosion. The Proposed Action is associated with the highest risk of degradation, followed by Alternative 3, Alternative 4, and Alternative 5. Stream bank conditions have been degraded from some past activities. The No Action Alternative and Alternative 1 are expected to maintain the current condition.

Watershed Condition - Human disturbance would be increased in the Proposed Action and all action alternatives. All include road development within Riparian Reserves. The more road development, including crossings, the more potential to degrade the watershed condition. Existing road development is concentrated within Riparian Reserves, thus the current "marginal" rating.

Harassment or Incidental Take - All Action Alternatives increase the risk of harassment and/or incidental take. Alternative 4 is associated with additional risk from the blasting of bedrock immediately adjacent to the main stem, which could result in the direct take of steelhead. Mitigation to reduce the risk of rock fall into the creek from bedrock blasting could be employed.

Biological Evaluation Summary

The Proposed Action and action alternatives are **Likely to Adversely Affect** Proposed and/or Listed anadromous salmonids. These findings have been submitted to the National Marine Fisheries Service for Consultation. "Likely to adversely affect" means that the project has more than a negligible potential to adversely affect these species. The finding is based on the Matrix of Factors and Indicators. No critical habitat would be adversely affected by this project.

The Proposed Action and action alternatives **May Impact** the R6 sensitive species' chinook salmon and cutthroat trout but **Will Not Likely Contribute** to a trend toward a federal listing or cause a loss of viability to the population or species.

Cumulative Effects

Active and proposed projects on federal lands that may affect listed species have been submitted to the National Marine Fisheries Service (NMFS) as part of an annual programmatic Biological Assessment for Rogue River basin fish species. The Nicore project has been submitted for consultation on coho salmon (and informal conferencing on steelhead). The NMFS will consider the Biological Assessment findings within the context of the cumulative impact on the basin's fishery.

Within the watershed, the effects of past activities on fish are unknown. Three water diversions on the main stem inhibit adult fish migration during low flow conditions. The conditions for fish prior to construction of the diversions is unknown.

PORT-ORFORD-CEDAR ROOT DISEASE

The Proposed Action and all action alternatives increase the risk of importing POC root disease into the analysis area. The choice of route and number and number and type of crossing affects the degree of risk. Some of the risk can be mitigated with a comprehensive disease containment strategy.

The No Action Alternative - The No Action Alternative continues the existing low risk of introduction of POC root disease into the analysis area. The risk is high, however, along the private land in Section 14. POC grows along the ditch on the private road. Residential traffic is likely to import the disease in the foreseeable future. Residents could employ disease control measures such as roadside sanitation to reduce the risk of introduction. This analysis assumes that residents do not employ such measures. Another potential introduction site is the Mars swimming hole, also in Section 14.

The Proposed Action - The Proposed Action is associated with the highest risk of all the alternatives. It includes the greatest number of perennial stream crossings (16). None of the crossings would be designed to eliminate contact with water. The Proposed Action includes two or more routes across the No Name Fan area where there are some large POC. It would also reconstruct the existing Alberg Road, which also contains notable POC stocking. The risk is somewhat reduced by including dry season operation. This route also includes the shortest haul distance, which is an advantage in terms of POC.

A containment strategy would be applied to Alternatives 1, 3, 4 and 5. The strategy would include vehicle and equipment washing; seasonal road closures to motorized traffic; sanitation of POC growing within 15 feet of the haul route in the No Name Fan area, Alberg Creek, and a few other locations; road drainage improvement, and reduction or elimination of contact between vehicle tires and water at stream crossings. The operator, BLM and FS will collaborate on specifics of the strategy as part of the final Plan of Operations.

With mitigation, the action alternatives are associated with varied levels of risk depending on choice of haul route:

Alternative 1 - Alternative 1 is associated with a moderately high risk as compared to the Proposed Action. As discussed under No Action, the private road is likely to become infested with root disease in the foreseeable future. Paving of the road, as proposed in Alternative 1, would reduce, but not eliminate this risk. Alternative 1 would also utilize the Alberg route. The reroute would be an improvement over the Proposed Action, but would still be associated with high risk.

Alternative 3 - Alternative 3 is associated with moderate risk as compared to the Proposed Action. Completely avoiding the Alberg route reduces the risk of spreading POC root disease in the analysis area. Alternative 3 includes about 1/4 mile of road construction in the No Name Fan area, which accounts for the moderate risk.

Alternative 4 - Alternative 4 is associated with low risk as compared to the Proposed Action. or Alternative 1. It avoids the Alberg route and new disturbance of the No Name Fan. The existing crossing on the 438 road remains a high risk site.

Alternative 5 - Alternative 5 is associated with moderate risk as compared to the Proposed Action or Alternative 1. Use of bridges would eliminate the risk of spreading the disease at Rough and Ready Creek crossings. The moderate risk is attributed to the use of the Alberg route and 1/4 mile of road construction in the No Name Fan area (see detailed Cost Spreadsheet in the analysisfile).

NOXIOUS WEEDS

No Action Alternative - The No Action Alternative maintains the current risk of spread of noxious weeds. Much of the analysis area is not accessible to motorized vehicles, and traffic via the existing road on private land is limited by residents. The private land and miner's residence are areas of the highest risk of establishment of noxious weeds.
Proposed Action - The Proposed Action is associated with the greatest risk of spread of noxious weeds. It increases access throughout the watershed. It also includes a stockpile site very near the known star thistle population.
Alternative 1 - Alternative 1 would include mitigation to reduce the risk of spreading noxious weeds. Access would be limited to mining-related traffic. Vehicle washing included in the POC mitigation would also help reduce the spread of noxious weeds from outside the analysis area. The use of the private road for the haul route may increase exposure to weed sources. The alternative stockpile site would be located away from known noxious weed populations.
Alternatives 3 and 4 - Both alternatives include about 2.5 miles of new road construction. Disturbed areas such as new roads are associated with increased risk of noxious weeds establishment. These alternatives would include mitigation to reduce the risk of spreading noxious weeds. Access would not be increased into the watershed for all but mining-related traffic. Vehicle washing included in the POC mitigation would also help reduce the spread of noxious weeds from outside the analysis area. The alternative stockpile site would be located away from known noxious weed populations.
Alternative 5 - Alternative 5 is associated with the least risk of all action alternatives. It minimizes new road construction and includes vehicle washing and road closures. The alternative stockpile site would be located away from known noxious weed populations.

BOTANICAL DIVERSITY/SENSITIVE PLANTS

The haul route common to all alternatives traverses the BLM Area of Environmental Concern (ACEC) and FS Botanical Areas. Of the 2500 acres in these areas, the area potentially affected makes up 1 percent (10 miles of road X 200 feet). Several FS sensitive and BLM special status plant were found along the haul route. Figure 16 displays the numbers of sites documented within 100 feet of the haul route, or within the mine sites themselves. Most of the data comes from surveys completed in 1997. Surveys were concentrated along the haul route; general surveys of the analysis area have not been completed.

Sensitive Plant Alternative Comparison						
Species (Common Name)	**PA**	**1**	**3**	**4**	**5**	**No Action**
Arabis "macdonaldiana" (Red Mt. rockcress)	1	0	4	4	1	3 sites are on ridge top, 1 near crossing #1.
Calochortus howellii (Howell's mariposa lily)	12	11	13	13	12	ONHP List 1 due to limited range. Rough and Ready habitat considered "selected habitat" in Draft Species Management Guides. Existing and proposed roads traverse this habitat.
Cardamine nuttallii var. gemmata (purple toothwort)	1	1	4	4	1	4 sites have been documented in the analysis area.
Epilobium rigidum (Rigid willow-herb)	4	3	4	4	4	8 sites have been documented in the analysis area, 4 of which are unaffected by this project.
Fritillaria glauca (Siskiyou fritillary)	4	0	4	4	4	10 sites have been documented in the analysis area, 5 of which are unaffected by this project.
Microseris howellii (Howell's microseris)	5	5	6	4	5	ONHP List 1 due to limited range. Rough and Ready habitat considered "selected habitat" in Draft Species Management Guides. Existing and proposed roads traverse this habitat.
Mimulus douglasii (Douglas's monkeyflower)	1	1	1	1	1	1 known site on BLM near haul route.
Monardella purpurea (Siskiyou monadella)	2	2	2	2	2	6 sites have been documented in the analysis area, 3 of which are unaffected by this project.
Perideridia erythrorhiza (Red-root yampqua)	1	1	1	1	1	1 known site in the analysis area, in Section 14.
Poa piperi (Piper's bluegrass)	1	1	1	1	1	2 sites have been documented in the analysis area, 1 of which are unaffected by this project.

Sensitive Plant Alternative Comparison						
Species (Common Name)	**PA**	**1**	**3**	**4**	**5**	**No Action**
Senecio hesperius (Siskiyou butterweed)	7	7	8	8	7	ONHP List 1 due to limited range. Rough and Ready habitat considered "selected habitat" in Draft Species Management Guides. Existing and proposed roads traverse this habitat.
Streptanthus howellii (Howell's streptanthus)	13	13	10	10	13	ONHP List 1 due to limited range. Rough and Ready habitat considered "selected habitat" in Draft Species Management Guides. Existing roads traverse this habitat.
Viola primulifolia ssp. occidentalis (western bog violet)	2	-	2	2	2	Grows in fen near Crossing #1. Also grows in downstream "critical fen" which is unaffected by this project.
Total Number of Species	14	10	14	14	14	--
Total Number of Sites	55	45	60	57	55	--

Figure 16. Sensitive Plant Alternative Comparison

Botanical Evaluation Summary

FS policy requires that a Biological Evaluation be prepared so that PETS species receive full consideration in the decision making process (FSM 2672.41). This summary focuses on FS R6 Sensitive Species. Discussions about the rare plant protection policies of both agencies are in the analysis file.

The findings displayed here are based on the worst case scenario. The species associated with "**Will Impact**" findings are Oregon Natural Heritage Program - ONHP List 1 and/or potential impacts sites are within "selected habitat" identified in Draft Species Management Guides. The "**Will Impact**" findings may be reduced if further survey and road design indicate that the potential impact sites can be protected. The FS, BLM and miner will collaborate on ways to avoid impacts to sensitive plants.

Arabis "macdonaldiana" - ARMC is a FS R6 sensitive species, BLM sensitive species, and an Oregon Natural Heritage Program (ONHP) List 1 species. It has a very narrow distribution; in Oregon, until this year, plant sites were only known in the Smith River drainage. In 1997, ARMC was found within the Illinois River drainage. This population within Mendicino County, California is listed as endangered under the Endangered Species Act. The populations further north are not currently considered endangered. All the sites yet known in the West Fork watershed are on a proposed haul route. Since the known local range is so limited, the Proposed Action and Alternatives 3, 4, and 5 are associated with a **"Will Impact** Individuals or Habitat with a Consequence that the action **May Contribute** to a trend towards federal listing or a loss of viability to the population or species" finding. The plants may be protected by routing the road away from the known sites. Protection of these sites could reduce the finding to **"May Impact**". No Action and Alternative 1 avoid these sites and are associated with a **"No Impact"** finding.

Calochortus howellii - CAHO3 is a BLM sensitive species, a FS R6 sensitive species, and is an ONHP List 1 species. A Draft Conservation Management Guide has been prepared for this species. The population along the haul route lies within "selected habitat" in the Draft Guide. CAHO3 is abundant within its selected habitat, and the haul route makes up a limited portion of the is area. The bench road included in Alternative D has not been surveyed, and lies within the selected habitat area. CAHO3 may also be impacted by the Proposed Action stockpile site. For the Proposed Action and all action alternatives, this species is associated with a **"Will Impact** Individuals or Habitat with a Consequence that the action **May Contribute** to a trend towards federal listing or a loss of viability to the population or species" finding. Some sites may be protected through rerouting the road. The alternative stockpile site would also be located to avoid this plant. In addition, bulbs may be removed from the impacted area and replanted in a more protected area. No Action is associated with a **"May Impact"** finding, due to the existing road.

Cardamine nuttallii var. gemmata - CANUG is an R6 sensitive species. Four sites occur within the FS portion of the analysis area, but only one site is on the haul route for all action alternatives. This species is associated with a **"May Impact** Individuals or Habitat but **Will Not Likely Contribute** to a trend towards a federal listing or cause a loss of viability to the population or species" finding. A close relative *Cardamine nutallii var. dissecta* is a BLM "tracking species". It is within 100 feet of the haul route on BLM. A site is also known at a potential alternate stockpile site.

Epilobium rigidum - This is a FS R6 sensitive species. The Proposed Action and all alternatives are associated with a **"May Impact** Individuals or Habitat but **Will Not Likely Contribute** to a trend towards a federal listing or cause a loss of viability to the population or species" finding.

Fritillaria glauca - This is a FS R6 sensitive species and BLM special status species. The Proposed Action and all alternatives are associated with a **"May Impact** Individuals or Habitat but **Will Not Likely Contribute** to a trend towards a federal listing or cause a loss of viability to the population or species" finding.

Microseris howellii - MIHO is a FS R6 sensitive and BLM special status species and an ONHP List 1 species. It is also considered "Threatened" on lands managed by the State of Oregon. A Draft Species Management Guide has been prepared for this species, and selected habitat includes the Rough and Ready Botanical Area and ACEC. The estimated total population of the species is 20,000 to 50,000 plants, most of which will not be disturbed by this project. The bench road included in Alternative D has not been surveyed, but lies within the selected habitat. For Alternatives 3 and 4, this species is associated with a "**Will Impact** Individuals or Habitat with a Consequence that the action **May Contribute** to a trend towards federal listing or a loss of viability to the population or species" finding. Some sites may be protected by rerouting the haul route. The Proposed Action and Alternatives 1, 5 and No Action are associated with a "**May Impact**" finding for this species.

Mimulus douglasii - MIDO is a FS R6 sensitive species and a BLM tracking species. One site has been documented on BLM near the haul route. This site is expected to be avoided through careful road activities. The Proposed Action and all alternatives are associated with a "**May Impact** Individuals or Habitat but **Will Not Likely Contribute** to a trend towards a federal listing or cause a loss of viability to the population or species" finding.

Monardella purpurea - MOPU2 is a FS Sensitive Species and a BLM special status species. A Draft Species Management Guide has been prepared for this species. Selected habitat occurs within the West Fork Watershed, but not within the analysis area. The Proposed Action and all action alternatives are associated with a "**May Impact** Individuals or Habitat but **Will Not Likely Contribute** to a trend towards a federal listing or cause a loss of viability to the population or species" finding. No Action is associated with a "**No Impact**" finding.

Perideridia erythrorhiza - PEER is a FS R6 and BLM special status species and an ONHP List 1 species. There are few known sites on the Siskiyou National Forest. The Proposed Action and all action alternatives, this species is associated with a "**Will Impact** Individuals or Habitat with a Consequence that the action **May Contribute** to a trend towards federal listing or a loss of viability to the population or species" finding.

Poa piperi - POPI is a FS R6 sensitive species. The Proposed Action and all action alternatives are associated with a "**May Impact** Individuals or Habitat but **Will Not Likely Contribute** to a trend towards a federal listing or cause a loss of viability to the population or species" finding.

Salix delnortensis - SADE2 is a FS R6 sensitive species and a BLM special status species. It grows in riparian areas. About 18 sites have been documented in the analysis area with 1 of these on the haul route for the Proposed Action and action alternatives. These are associated with a "**May Impact** Individuals or Habitat but **Will Not Likely Contribute** to a trend towards a federal listing or cause a loss of viability to the population or species" finding. No Action is associated with a "**No Impact**" finding.

Senecio hesperius - SEHE is a FS R6 and BLM sensitive species, and an ONHP List 1 species. A Draft Species Management Guide has been prepared that considers the Rough and Ready Botanical Area selected habitat. Population is estimated at 5,000 to 10,000 individuals. Ten sites have been identified on the haul route for the Proposed Action and action alternatives. The bench road included in Alternative D has not been surveyed, and lies within the selected habitat. The Proposed Action and all action alternatives are associated with a "**Will Impact** Individuals or Habitat with a Consequence that the action **May Contribute** to a trend towards federal listing or a loss of viability to the population or species" finding for this species. The No Action alternative is associated with a "**May Impact**" finding. SEHE may also occur in the Proposed Action stockpile site. The alternative site would be located to avoid this species.

Streptanthus howellii - STHO is a FS R6 and BLM sensitive species, and an ONHP List 1 species. There are 13 sites documented on the haul route for the Proposed Action and Alternatives 1 and 5. The total known range of this species is limited. Individuals and groups of this species that are unaffected by the project exist within the FS Botanical Area. Three sites may be avoided through choosing the ridge route rather than the Alberg route. For the Proposed Action and all action alternatives, this species is associated with a **"Will Impact** Individuals or Habitat with a Consequence that the action **May Contribute** to a trend towards federal listing or a loss of viability to the population or species" finding. No Action is associated with a **"May Impact"** finding.

Viola primulifolia ssp. occidentalis - VIPRO is a FS R6 and BLM sensitive species, and an ONHP List 1 species. It grows in fens with other Siskiyou endemic species including darlingtonia. The haul route comes very close to one fen where this plant grows. No potential critical fens under the Draft Conservation Agreement would be impacted. The Proposed Action and all alternatives are associated with a **"May Impact** Individuals or Habitat but **Will Not Likely Contribute** to a trend towards a federal listing or cause a loss of viability to the population or species" finding.

ACEC and MA-4 (Botanical Area) Standards and Guidelines

BLM and FS guidelines emphasize protection of the botanical resources in these areas. FS S&G MA4-10 states that "every effort should be should be made to protect botanical resources, especially sensitive plant species." Mitigation such as road design considerations and route choices, minimizing road development within the Botanical Area, removal and replanting of affected species, and monitoring would meet this standard. About 7.7 miles of road currently exist within the Botanical Area and ACEC. Mine site C is within the Botanical Area. No sensitive plants were found on this site in the 1997 survey.

	Proposed Action	No Action	Alternative 1	Alternative 3	Alternative 4	Alternative 5
Miles of New Construction in Botanical Area (MA-4)	0.1	0	0.1	0.2	0.6	0.2
Miles of Reconstruction in Botanical Area	6.7	0	5.3	6.0	5.9	6.1
Miles of Reconstruction in ACEC	0.75	0	0.75	0.75	0.75	0.75

Figure 17. Road Construction and Reconstruction within the Botanical Area and ACEC.

Loss of Habitat on the Mine Sites and On Roads

Serpentine habitat within the actual mine sites and road templates would be degraded during and after operations. STHO (2 sites) is the one sensitive plant species found growing on a mine site. Plants on the road or at the mine sites are likely to be killed. Native plants tolerant to disturbance are expected to be re-established on these sites over time, once mining or road use has ceased. Conifers, woody shrubs, and native grasses would be planted as part of the reclamation plan.

Cumulative Effects

Other mining projects such as Gasquet Mountain on the Six Rivers National Forest, and Stewart Mine on the Umpqua National Forest lists some of the same plants in their respective areas. Future mining within Rough and Ready Creek would likely have some further impacts on the species described above.

COSTS OF ROAD DEVELOPMENT

The costs of road development and use was estimated for each alternative. A detailed spreadsheet listing costs for components of the Proposed Action and alternatives is in the analysis file. A summary of the data is presented here.

	Proposed Action	No Action	Alternative 1	Alternative 3	Alternative 4	Alternative 5
Total Construction and Reconstruction Costs[1]	$625,560	0	$591,370	$608,560	$527,030	$586,970
Dust Abatement Costs over Ten Years	$158,900	0	$71,100	$107,000	$109,900	$107,000
Gates	0	0	$2,000	$2,000	$2,000	$2,000
Haul Costs	$670,824	0	$711,480	$738,584	$735,196	$684,376

Figure 18. Costs of Road Development

[1]Estimated costs include all borrow, fill and surfacing, crossing structures, and costs of removing and replacing crossings annually. Bridges cost about $10,000 each, large culverts cost about $2,000 each and small culverts cost about $500 each.

EFFECTS ON RESIDENTS

Dust and Noise

Road development and increased traffic (including 15 - 20 round trips with an articulated dump truck per workday, service vehicles, and other equipment) are likely to increase dust and noise for nearby residences. Residents living within one-quarter mile of the haul route would be especially affected. The haul route associated with the Proposed Action and Alternatives 3, 4 and 5 would come within one-quarter mile of **5** homes. Residents would experience an increase in dust from road use. In these alternatives, dust abatement would be included for parts of the haul route that may impact residences. Traffic noise would be very noticeable at **3** homes.

Alternative 1 impacts more homes, with **16** residences within one-quarter mile of the haul route. Paving of the private road would likely reduce dust from current levels. Some increase in dust could occur from the rest of the haul route. Dust abatement is expected to reduce this amount. The sound of truck traffic would be particularly noticeable at **7** homes.

The No Action alternative would continue the current situation. Dust is a problem for residents living on dirt or graveled roads. While some dust is generated on BLM and FS lands, the primary dust problem for residences is on private roads. Residents put up signs requesting people drive slowly to minimize dust. In general, the analysis area is known for quiet and solitude for residents.

Safety Issues

Safety issues have also been raised regarding the Proposed Action. Local residents enjoy swimming, biking, hiking and horseback riding within the analysis area. Area youth frequent the swimming holes in the main stem of Rough and Ready Creek. Access to "Mars" swimming hole is on or near the haul route. All of the action alternatives include mitigation to reduce user conflicts and safety hazards. The operator, BLM, FS and residents would collaborate on appropriate safety measures.

VISUAL QUALITY, RECREATION, and INTERPRETIVE DEVELOPMENT

Visual Quality

Visual quality would likely be reduced in the Proposed Action and all of the action alternatives. Road development and increased use would be evident to residents and visitors. Currently, the roads accessing the proposed mine sites are rarely used, and are generally not noticeable from the valley floor. Increased use would make the roads more visible, given dust plumes and noise drawing attention. Alternatives 3 and 4 include new road construction that may be visible from several residences. The bench road included in Alternative 4 would be in the direct view of one or two residences. For FS lands, the Visual Quality Objective is modification. The level of development proposed in all action alternatives is consistent with this objective.

The location of the stockpile site would have a direct effect on visual quality. The Proposed Action includes a stockpile site that is near the highway and within the direct line of sight of an interpretive trail overlook proposed on the north side of Rough and Ready Creek. The site is within the ACEC, where the BLM visual quality objective (see the Medford District Resource Management Plan) states: Management activities may attract attention but should not dominate the view of the casual observer. The Proposed Action stockpile site would not meet this objective because it would tend to dominate the view from the interpretive trail. The areas considered for the stockpile site in all action alternatives would better meet this objective by locating the site away from the interpretive trail and the highway.

Recreation

Current use of the area for recreation is generally low. The Botanical Wayside, ACEC, Mars Swimming Hole, Seats Dam, and the Siskiyou Meadows Youth Camp receive moderate use. Local residents enjoy horseback riding and hiking the existing roads. The No Action alternative would continue the current use. Development of the interpretive area is likely to increase users in the ACEC and Botanical Wayside.

The Proposed Action would increase motorized access on roads that are not currently driveable. Recreation traffic would likely increase, and with it, user conflicts. Road design criteria, including turn outs, would mitigate for some safety concerns given increased traffic. The 15 - 20 round trips per day with ore trucks would likely degrade the recreation experience.

Alternatives 1, 3, 4 and 5 would not increase motorized traffic to currently inaccessible parts of the analysis area, because gates would be placed to restrict casual traffic. Hiking, biking, and horseback riding could still occur. During workdays, these experiences are likely to be degraded from the 15 - 20 round trips with ore vehicles and related traffic. User conflicts may occur in the lower, currently accessible portions of the analysis area.

Interpretive Development

The Proposed Action stockpile site is in direct view of an interpretive trail planned by the Oregon State Parks, BLM, Garden Club, Illinois Valley Community Response Team and other groups. The action alternatives would better screen the stockpile site, but ore haul and other activities may disturb users of the trail.

ROADLESS CHARACTER

All of the action alternatives would degrade the roadless character of the area (see Chapter Three for a description of Roadless Character). The amount of road development and new construction within the SK roadless area is displayed in Figure 19. Currently 12.2 miles of road exist within the SK portion of the analysis area.

	Proposed Action	No Action	Alternative 1	Alternative 3	Alternative 4	Alternative 5
Miles of New Construction in SK	0.5	0	0.5	2.5	2.5	0.5
Miles of Reconstruction in SK	8.0	0	7.0	7.6	7.6	7.4

Figure 19. Road Construction and Reconstruction within the SK portion of the analysis area.

Alternatives 3 and 4 would have the greatest impact on roadless character because of increased motorized access along a ridge that currently is not accessible. All action alternatives would improve access along low-standard roads. These roads are likely to remain part of a long term transportation network. Road closures included in all action alternatives (not the Proposed Action) would reduce some impacts to roadless character. The mining operation and haul would likely degrade the experience of solitude some people value in the area.

Cumulative Effects

Past mineral exploration within the watershed likely had significant effects on the roadless character of the area, although the lack of use in recent years has reduced the intensity of these effects. No other developments are currently being considered within the SK.

AQUATIC CONSERVATION STRATEGY and RIPARIAN RESERVE STANDARDS AND GUIDELINES

Aquatic Conservation Strategy

This analysis of the Aquatic Conservation Strategy objectives integrates many of the previous discussions and provides further context for analysis of direct, indirect, and cumulative effects.

1. *Maintain and restore the distribution, diversity and complexity of watershed and landscape-scale features to ensure protection to the aquatic systems to which species, populations and communities are uniquely adapted.*

The Proposed Action and all of the alternatives may be expected to maintain the distribution, diversity, and complexity of the Rough and Ready Creek watershed and landscape-scale features.

2. *Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.*

Spatial and temporal connectivity within the analysis area would be impacted by the Proposed Action and all action alternatives. Alternative 1 avoids most major crossings and Alternative 4 avoids Crossings #2 and #3 and the Alberg Route. These alternatives best maintain connectivity. The Proposed Action may physically obstruct routes to areas critical for fulfilling life history requirements of aquatic (i.e., salmonids) and riparian species and therefore would not meet the intent of this objective.

3. *Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.*

The physical integrity of the aquatic system as a whole is likely to be maintained, however shorelines and streambanks would be degraded at perennial crossing locations. Alternatives 1 and 4 effectively reduce the number of stream crossings needed. Bottom configuration may be degraded along the main stem of Rough and Ready Creek during low flow conditions in alternatives that include fords and/or culverts (PA, Alt 1, Alt 3, Alt 4). The high stream power at high flows would likely restore bottom conditions annually. Use of bridges (Alt 5) at these crossings would minimize adverse effects to low flow bottom configuration.

4. *Maintain and restore the water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.*

Water quality may be degraded in all of the action alternatives (see physical science report). State water quality standards may be exceeded for short duration and distance downstream from the crossings. The Proposed Action, with its low water fords and lack of annual removal of washed rock at the crossings, would have the greatest impact on water quality. Other alternatives are associated with less impact; for instance, Alternative 5 is associated with one-tenth the risk of sediment at stream crossings. The project is associated with a variety of other risks, including potential for slope instability at Mine Site D, additional sediment delivery from road construction and reconstruction, or spills at crossings. Unless there are high magnitude landslides, and/or serious hazardous material spills, the water quality would be expected to remain within the range that currently supports biological, physical, and chemical integrity to support aquatic and riparian species.

5. *Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage and transport.*

See section regarding Sediment Delivery. Some site-specific changes in timing (under low flow conditions), volume, rate, and character of sediment input, storage, and transport can be expected in the vicinity of the proposed vehicle crossings.

6. *Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high and low flows must be protected.*

The Proposed Action and all of the alternatives are expected to maintain in-stream flows sufficient to create and sustain riparian and aquatic habitats. Wetland habitat associated with the "No Name Fan" may be degraded in the Proposed Action and Alternatives 3 and 5. Wetland habitat also occurs near Crossing 1. The Proposed Action, with its use of the existing Alberg road, may interfere with routing of down wood into the stream.

7. *Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.*

Road development within the Rough and Ready floodplain is not expected to affect the timing, variability, and duration of the floodplain inundation and water table elevation in meadows. However, some impacts to small wetlands and fens may occur from road development near Crossings #1, #2 , #3, and #4.

8. *Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of woody debris sufficient to sustain physical complexity and stability.*

Some plant species within riparian areas may be affected by road construction, reconstruction and use within all of the action alternatives. Rare species at risk include fen species such as darlingtonia and western bog violet, and riparian species such as Del Norte willow. Alternatives that reduce the amount of road development in riparian areas are associated with less risk. Structural diversity of plant communities, and maintenance of summer and winter thermal regulation are not likely to be directly affected by any alternative, however, indirect effects based on the introduction of POC root disease may, in the long run, reduce diversity and thermal regulation within riparian areas supporting this species. Noxious weed introduction could also indirectly impact species composition and structural diversity by out-competing native vegetation. Loss of vegetation is not likely to affect maintenance of nutrient filtering, and/or appropriate rates of surface erosion, and channel migration. Bank erosion may be accelerated by loss of vegetation at crossings (see physical science report for alternative comparison).

9. *Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.*

The Proposed Action and all alternatives are expected to maintain habitat to support well-distributed populations of wildlife within the analysis area. No wildlife species would be significantly affected by the project. Many sensitive plant species, however, may be adversely affected by the alternatives.

Riparian Reserve Standards and Guidelines

Roads Management

RF-1. Federal, state and county agencies are working in cooperation to achieve consistency in road design, operation, and maintenance necessary to attain the Aquatic Conservation Strategy Objectives.

RF-2.

a. The Nicore project requires significant road development within Riparian Reserves. Alternative 1 is designed to minimize road development there, and Alternative 4 minimizes the number of perennial stream crossings.

b. Project level analysis will be completed, including geotechnical analysis, on the final selected alternative. The West Fork Illinois River Watershed Analysis provides context for the project level analysis.

c. Road design criteria, elements, and standards governing the construction and reconstruction of roads within the Riparian Reserve are being prepared in association with this analysis (see road access document).

d. Preparation of criteria for the operation and maintenance of roads within the Riparian Reserve are also being done in association with this analysis (see road access document).

e. Roads designed for this project would be constructed using Best Management Practices and other criteria to minimize disruption of natural hydrologic flow paths. Some diversion of stream flow could occur at the crossings, especially under the Proposed Action. Surface and subsurface flow may be interrupted.

f. All roads would be designed to minimize sediment delivery into streams. Alternatives 3 and 4 are associated with the least amount of potential sediment (see physical science report).

g. None of the action alternatives avoid wetlands entirely. Alternatives 1 and 4 avoid the most significant wetlands within the analysis area.

RF-3. The West Fork Watershed Analysis identified some roads that retard achievement of Aquatic Conservation Strategy Objectives. The Alberg Road currently is an active source of sediment.
a. All action alternatives would abandon the current location of the Alberg road. Road construction and reconstruction would be designed to achieve objectives.
b,c. The West Fork Watershed Analysis recommended and prioritized restoration activities, including road projects, within the watershed. The Alberg road would be closed and stabilized under Alternatives 3 and 4. Annual stormproofing would be required in all action alternatives prior to the wet season. Roads would be closed to the public in all action alternatives (roads would remain open in the Proposed Action).
RF-4. No culverts would remain in place during winter high flow conditions. All crossings would be designed to maintain to prevent diversion of stream flow out of the channel and down the road in the event of a crossing failure.
RF-5. All the action alternatives would outslope or improve drainage on roads to minimize risk of sediment delivery. Alternatives 1 and 5 and the Proposed Action utilize the Alberg route, which would likely increase the risk of sediment delivery.
RF-6. The Proposed Action may retard the maintenance of fish passage during low flow conditions. All of the other alternatives are expected to maintain existing fish passage. The use of bridges (Alternative 5) is likely the most effective way of maintaining fish passage during low flow conditions.
RF-7. For the final selected alternative, a project road management plan (including Road Management Objectives) will be developed to meet the Aquatic Conservation Strategy objectives. Inspection and maintenance during (or immediately following) storm events may only be possible during the summer operating season; access across Rough and Ready Creek would not likely be possible during winter storm events. All action alternatives would approve only dry season operation and road use.

Minerals Management
MM-1. No mining within Riparian Reserves is proposed, however, a reclamation plan and bond will be required for the final, approved Plan of Operations.
MM-2. All the action alternatives include road development within Riparian Reserves. The impact of these roads on the Aquatic Conservation Strategy objectives is described elsewhere in this report. The Proposed Action would locate a stockpile site that is partially within the main stem Rough and Ready Creek Riparian Reserve. The other action alternatives would site this facility outside the Riparian Reserve. Road development within Riparian Reserves is minimized in all action alternatives (see Table 1 - the Proposed Action would develop substantially more roads within the reserves that the other alternatives). The action alternatives would construct and maintain roads to meet roads management standards and minimize resource damage. The Proposed Action would clearly not meet this standard, because it includes a crossing that is not necessary (Crossing #4) and does not include specific design criteria to minimize resource damage. The Road Access Documentation Memo (available in the analysis file) describes criteria included for all action alternatives. Roads will be stormproofed annually under all action alternatives. When the mining operation is complete, the roads may be decommissioned, depending on whether they are required for future mining.

At the minimum, the roads will be stormproofed. The roads would be closed to the public during

mining operations in all action alternatives (the Proposed Action does not include provisions for road closures). All action alternatives (except the Proposed Action) would abandon portions of the Alberg Route. Under these alternatives, the FS would consider decommissioning and/or obliterating this road within its regular road management program. At the least, the road would be stabilized.
MM-3. Solid or sanitary waste facilities are not proposed within the Riparian Reserves.
MM-4, 5. Leasable and/or salable mineral activities are not proposed in this project.
MM-6. The Proposed Action and all action alternatives include inspection and monitoring requirements designed to effect the modification of the Plan of Operation as needed to eliminate impacts that retard or prevent attainment of the Aquatic Conservation Strategy objectives.

WILD AND SCENIC RIVER ELIGIBILITY - OUTSTANDINGLY REMARKABLE VALUES

The Outstandingly Remarkable Values (ORVs) associated with the main stem Rough and Ready Creek include Wildlife, and Geological/Hydrological, and Botanical/Ecological.

Wildlife - O'Brien Caddisfly

The O'brien Caddisfly (*Rhyacophila colonus)* was considered an Outstandingly Remarkable Value within the lower reaches of Rough and Ready Creek. Available records reveal *R. colonus* to be known from a single type locality. Four adult males and four adult females were collected by the Canadian F. Schmidt during a visit to the Illinois Valley (the general vicinity of O'Brien, Oregon - actual location unknown) in June of 1965. These specimens are presently located at the Institute of Entomology Research, Ministry of Agriculture in Ottawa, Canada. *R.. colonus* has not been located in the area since.

In 1996, The Nature Conservancy attempted to collect *R. colonus* on the lower reaches of Rough and Ready Creek using black light traps. *R. colonus* was not found in the traps. Specific habitat associations for the species have yet to be identified (larva of this genus are most commonly found in small to mid-sized streams in forested montane areas of the Pacific Northwest). The lower reaches of Rough and Ready Creek may not provide suitable habitat. In any event, until the species can be again located and the exact habitats described, it is futile to speculate on the possible risks of the Proposed Action and/or other alternatives. Continued sampling for the species is recommended.

Geological/Hydrological

The unusual stream morphology (large substrate and wide alluvial fans) led to the identification of the Geological/Hydrological ORV on the main stem Rough and Ready Creek. The Proposed Action and all alternatives will protect this ORV.

Botanical/Ecological

The high number of rare plant species growing within one-quarter mile of the main stem Rough and Ready Creek led to the identification of the Botanical/Ecological ORV. The haul route in Sections 14 and 15 may disturb rare plants within the eligible creek corridor. Collaboration between the FS and the mine operator in road design and other possible mitigation will be necessary to adequately protect these plants.

NON SIGNIFICANT EFFECTS

Cultural Resources

A cultural resource survey did not indicate any historic, prehistoric, or cultural sites that might be adversely affected by this project.

Wildlife and Vegetation

Hundreds of vertebrate and thousands of invertebrate species may occur within the Nicore analysis area. The distribution and abundance of wildlife Species of Concern was described in the West Fork Illinois River Watershed Analysis (available upon request in the analysis file). The Proposed Action nor any of its alternatives are likely to adversely affect any PETS wildlife species, or critical habitat. No known migration routes (for species other than fish) would be affected. Vegetation conditions were also discussed in the West Fork Watershed Analysis. Although the action alternatives would remove some native vegetation, it is not expected to significantly degrade any late-successional or other special habitat, except as noted previously in this chapter.

Habitat for BLM sensitive species *Rana boylii* (yellow-legged frog) exists within the analysis area. No significant effects on this species are expected. Habitat for *Plethodon elongatus* (del Norte salamander), a FS R6 and Survey and Manage Strategy 2 species, also occurs within the analysis area. No impact on this species is expected.

Artificial Lights

Artificial lighting is not a part of the Proposed Action, nor any alternatives. Artificial lighting would not be approved without an amendment to the final Plan of Operations and appropriate further analysis.

Fire Hazard

Some people have suggested that the project may increase the fire hazard in the area because of increased traffic and use of equipment. The operation would be required to follow Industrial Fire Precaution Levels for federal lands. The increased access associated with the action alternatives is likely to greatly improve wildfire suppression capabilities in the area.

Water Temperature

Some concerns have been raised that the Proposed Action may increase water temperature in Rough and Ready Creek by disrupting cool water springs at the crossings. This issue was considered in the analysis, but not found to be significant. The springs appear to reduce water temperature where they enter the river, but mixing occurs almost immediately downstream. Road development is not expected to significantly affect these processes.

Stream Flow

The Proposed Action and all action alternatives may require some water to be pumped from Rough and Ready Creek and used in road development activities, including dust abatement. The amount of water removed is not expected to have adverse effects on stream flow (details are in the Physical Science Report in the analysis file). The Operator would be responsible for obtaining a water right as needed.

Air Quality

None of the alternatives would have significant impacts on air quality. Dust abatement would be used where needed to provide for safety, aesthetics, and local air quality impacts. No Class I airshed or population center would be affected.

Reclamation Effectiveness

Some people have raised concerns that the reclamation of the mine pits may not be possible because of the harsh serpentine environment. Research into serpentine revegetation is limited, however existing research suggests it can be achieved. Reclamation objectives (restoring site stability and native vegetation) are the same across the action alternatives. The miner will be required to demonstrate how to meet these objectives as a contingency of approval of the Plan of Operations. Final design of the reclamation plan will be based on input from the miner, the FS, BLM and the State Department of Geology and Mineral Industries.

Impact on the Wild and Scenic Illinois River

The Wild and Scenic River is over 10 miles from the analysis area. Effects from this action will be so diluted by other inputs on the river, no impact is anticipated. Other thresholds would be far exceeded before downstream Wild and Scenic river values would be affected.

ISSUES THAT COULD NOT BE ANALYZED IN THIS EIS

The Project is Not Feasible

This issue was raised by people who do not believe that this project is actually feasible. The mining laws protect the claimant's right to mine, whether or not the operation is known to be economically viable.

This Action Should Not Be Analyzed Without a Smelting Facility Identified

The Responsible Official decided to analyze the project without a facility identified, but will not approve the final Plan of Operations until a smelting facility is identified and any additional environmental analysis needed is completed.

The 1872 Mining Law is Outdated

This issue is beyond the scope of project analysis. Concerns about the law cannot be resolved in this EIS. Chapter Four includes a section about conflicts between laws, policies, and plans.

The EIS Must Consider the Effects of the 4,000 acre Patent Application

The patent application has no bearing on this EIS. Some people believe the high acreage in the patent application indicates that the miner wishes to develop a much larger mine than disclosed at this time. However, no evidence exists to substantiate this concern. The miner has indicated that should this operation prove successful, development of hundreds of acres accessed from the existing roads may follow. However, the actual location or potential effects would be too speculative to include in this analysis.

Were the existing roads authorized? Is the claimant's occupancy on BLM lands appropriate?

These issues are irrelevant to this analysis. The FS and BLM maintains case files about claim administration and road development through time. The attention paid to the details of road development is a recent phenomenon; in the past, mining roads were constructed with little FS oversight. No evidence that the roads were built illegally exists.

POTENTIAL CONFLICTS WITH PLANS AND POLICIES OF OTHER JURISDICTIONS

The General Mining Laws appear to conflict with policies of the FS and BLM aimed at protecting surface resources. None of the action alternatives meet all Standards and Guidelines in the Northwest Forest Plan.

SPECIFICALLY REQUIRED DISCLOSURES

Relationship Between Short Term Use and Long Term Productivity

The analysis area is considered a low-productivity area in terms of total biomass production. Road construction and improvement would reduce the long term productivity along the haul route. This reduction would continue as long as the roads are being used, and perhaps beyond (roads in the analysis area do not tend to "reclaim" themselves).

Consumer and Civil Rights

The project is unlikely to have significant effects on consumers or impact civil rights.

Farmlands, Wetlands, and Floodplains

No farmlands would be affected by this project. Impacts to wetlands and floodplains are discussed under the Aquatic Conservation Strategy discussion previous in this chapter.

Socio-Economic

All of the action alternatives would create some employment. Property values would also likely increase along the private road if it were improved under Alternative 1. Property values in the analysis area may also increase as the mining operation continued. The mining operation would also contribute to the tax base.

Irreversible and Irretrievable Commitment of Resources

Minerals are considered a non-renewable resource. Roads are not usually considered an irretrievable commitment of resources, however, these roads are not likely to be reclaimed through usual means. The new bench and ridge roads, along with the existing routes, are likely to remain evident on the landscape for centuries to come.

Energy

The project does not pose an unusual use of energy.

CHAPTER FIVE
LIST OF PREPARERS

Mathew Craddock - Realty Specialist

Education:	B.S. Forest Recreation
Experience:	Bureau of Land Management - 17 years - Fire, Recreation, Forestry, Lands, and Minerals (Oregon)
Function:	BLM Minerals Administration

Rochelle Desser - Planner

Education:	A.S. Earth Science
Experience:	Forest Service - 12 years - Environmental Analysis and Documentation, Interdisciplinary Team Leader, Forestry Technician; Forestry Contractor - 9 years - (Washington, California, Idaho, Montana, New Mexico, and Oregon)
Function:	IDT Leader, EIS Writer-Editor

Linda Mazzu - Botanist

Education:	B.S. Park Management, M.S. Natural Resources
Experience:	National Park Service - 13 years; Bureau of Land Management - 3 years - Botany, Natural Resource Management (Arizona, California, Washington D.C., Oregon)
Function:	BLM Botanical Assessment

Judith McHugh - Hydrologist

Education:	B.A. Geology, M.S. Geology
Experience:	Forest Service - 8 years - Hydrology (Idaho, California, and Oregon)
Function:	Hydrology

Don McLennan - Forester

Education:	B.S. Forestry
Experience:	Forest Service - 31 years - Recreation Management, Range Management, Mineral and Land Use Management (Arizona, New Mexico, and Oregon)
Function:	Recreation

Roger Mendenhall - Forester

Education:	B.S. Forestry
Experience:	Forest Service - 33 years - Forest Management, NEPA, Appeals, Litigation (Washington, Montana, and Oregon)
Function:	NEPA Consultant, Air Quality, Employment/Property Values

Linda Mullens - Forest Botanist

Education:	B.S. Wildlife Management
Experience:	Forest Service - 17 years - Botany, Wildlife & Fish Biology (Oregon)
Function:	Sensitive Plant Analysis

John Nolan - Minerals Technician

Education:	General Science - Southern Oregon State College
Experience:	Forest Service - 22 years - Minerals, Timber, Special Uses (Oregon)
Function:	Minerals Administration

Robert O'Leary - Assistant Forest Engineer

Education:	B.S. Forest Management, B.S. Forest Engineering
Experience:	Forest Service - 40 years - Forest Management, Engineering (Oregon)
Function:	Transportation System

Larry Pera - Forestry Technician

Education:	A.S. Forestry
Experience:	Forest Service - 20 years - Range Survey and Data Collection, Tree Improvement Coordinator, Timber Management, Port-Orford-Cedar Coordinator (Oregon)
Function:	Port-Orford-Cedar Analysis

Cindy Ricks - Resource Geologist

Education:	B.S., M.S. Geology
Experience:	Forest Service - 13 years, Redwood National Park - 2 years, Corps of Engineers - 2 years; geomorphology, landslide and erosion hazard assessments, sedimentation and channel effects, cumulative watershed effects, and engineering geology. (California and Oregon)
Function:	Physical Sciences

Maria Ulloa-Cruz - Forest Botanist

Education:	B.S. Agronomy
Experience:	Forest Service - 12 years - Culturist, Botanist (Idaho, California, and Oregon)
Function:	Botanical Assessment

CHAPTER SIX - LIST OF AGENCIES, ORGANIZATIONS, AND INVIDIDUALS WHO RECEIVED COPIES OF THE DRAFT EIS

FEDERAL AGENCIES
(Mandatory Agencies)

Western Office of Review, Advisory Council on Historic Preservation
USDA, OPA Publication Stockroom
Deputy Director, BBEP, EAD, Animal & Plant Health Inspection Service, USDA
USDA, Office of Equal Opportunity (OEO)
USDA, National Resource Conservation Service
USDA, National Agricultural Library
Director, Ecology and Conservation Office
National Marine Fisheries Service
U.S. Army Engineers Division
Naval Oceanography Division
Office of Envrnmntl Compliance, U.S. Department of Energy
EIS Review Coordinator, EPA
Federal Aviation Administration Advisor on Environmental Quality
Region 10, Federal Highway Administration
Office of Transportation and Regulatory Affairs, Federal Railroad Administration
General Services Administration
Bureau of Indian Affairs
U.S. Department of Housing & Urban Development
USDI, Office of Environmental Affairs
Chief, Energy and Environment, Interstate Commerce Commission
Northwest Power Planning Council
Assistant Secretary for Policy, U.S. Department of Transportation
U.S. Coast Guard (USCG)
USDA-Forest Service
USDI-Bureau of Indian Affairs

OREGON STATE AGENCIES

Department of Fish and Wildlife
Parks and Recreation Department
Water Resources Department
Division of State Lands
Department of Geology and Mineral Industries
Department of Environmental Quality
Department of Land Conservation and Development
Economic Development Department State Economist
Forestry Department
Governor's Forest Planning Team

TRIBES, INDIVIDUALS, ORGANIZATIONS AND OTHER FEDERAL, STATE AND LOCAL AGENCIES

KEVIN B. AARDAHL
LINDA ADLER
GLENN ALMANY
SARA ALOFSIN
AMERICAN RIVERS
TODD ANDERSON
TOM & VIRGINIA ANGENENT
JUDY ANO
APPLEGATE VALLEY GARDEN CLUB
ALEX ARMENDARIZ
GAY AUSTIN
KIM AUTREY
ELDON E. BAKER
TODD A. BAKER
APRIL BALINT
BRIAN BANTON
URSULA BECHERT DVM
RUDOLPH BECKING
JENNIFER BEIGEL
GREG BJORK
EMILY AMBER BLASKOVICH
JOSEPH & BARBARA BLESER
DARREN BORGEIAS
MARY C. BOSWORTH D.C.
AL BOURGO
CLIFFORD BOVE
GERALD R. BOWES
KATHERINE BRADFORD
ED BROWN
JAN BROWN
WES & NANCY BROWN
DANIEL BROWNSTEN
ROB BRUNO
MYLENE AND GARY BUCK
AIMEE BUCKMASTER
JULIA R BUEREN
HARRIET BURGESS
CHRISTOPHER H BURKE
ELVIN BURNS
BARBARA A. BYRNE
MARIANNE and ALBERT CALO
JEAN E CALDWELL
BRUCE CAMPBELL
HOLLY CAPPELLO
KENNETH & CARRIE CARLSON
STACY CARPENTER
JANE CASS
KEVIN CATALDI
SETH CHAPIN
HELLENE CHAPMAN
SUSAN CHAPP
SARAH J CHAVEZ
GAYEL G. CHEW TRUSTEE
HOY CHOATE
CITY OF CAVE JUNCTION
CAROLYN CLARK
ROBERT & ILA CLARK
BECKY CLAUSEN
ERIC CLOUGH
ROBERT & JUNE COLLINS
CHRISTINE COLVIN
CONFEDERATED TRIBES OF GRAND RONDE
DAVID A. & BARBARA L CONNER
DAVE CONNOLLY
KEN COOLEY
COTTAGE INDUSTRIES
AL TOZER JR.
JOHN COULTER
SUSAN COX
JOYCE CREED
LISA A. CUMMING
BREE DANIEL
PATRICK D DANLEY
VERONICA DE LA RIVA
RYAN DEGANT
SUSAN DELLES
MIKE DENNY
DICKENSON PEATMAN & FOGARTY
DOUGLAS DILTS
DOUGLAS W. DODD
MICHAEL DOWLING
DEAN H DU VERNET
GWEN DUBOIS
BARBARA DUDMAN
CHRISTY DUNN
LAURA DUTTON
ECOLOGY CENTER OF SO CALIF
ELAINE EDLIN
MARCY EDWARDS
CARLOS ELIZONDO
LEE ELLIS
HELEN EMERICK
REID H EMMERICH

GEORGE & JULIA EMMETT TRUSTEE
TRACY ERGELS
ERRAS WINONA FEECHELY TRUSTEE
HEIDE MARIE EUBANKS
NICHOLE EVEANIAN
JOAN FAGALDE
JERRY & BLYTHE FAIR
JOHN W. & ROMONA M. FAUNCE
FEDERAL COURTHOUSE
SAM FETCHERO
AMY FISHER
HENRY R. FLETCHER
KATIE FLOOD
RON & LA VINA FONSECA
DONALD FONTENOT
RANA FOSTER
WALT FREEMAN
H PAUL FRIESEMA
RONALD R FROST
LEE FULLERTON
KAREN GAGNON
CHRISTINE GAMMONS
BERNARD GARCIA
JACQUELINE GATES
ALBERTA GEROULD
KATHY GING
KENNETH & MARIA GOEN
EDWARD L. & KAREN J.
BENJAMIN GORMAN GOODRICH
P. GRIMAUD
THOMAS L GRITZKA MD
ALETA GROENIG
MARY GURNEY
JAMES D. HALL
NANCY HALL
REBECCA HALL
WAYNE & DORIS HALL
GEORGE L. HARPER
HAWAIIAN SKIN CARE
MARIANNE HAWKES
HEADWATERS
DON HEDGEPETH
K. HEERSPINK
JOCELYN HELLER
LORIN & LINDA HENRY
ELIZABETH HERBERT
KURT & TERRY LEE HILSCHER
MARK HIXON
HARVEY HIXSON
CYNTHIA HOBBINS
CATHY HOCKER
PETER HOFTIEGER
RETLA HOLDUF
BETH HOWELL
DANIEL LEE HOWELL JR.
DARRYL HRENKO
JENNI HUELSMAN
SARAH HUNEWILL
RICHARD & RUTH HUTCHENS
ROBIN HUTCHENS
JIM HUTTON
FORESTRY ACTION COMMITTEE
JUNE A. ROBINSON
ILLINOIS VALLEY GARDEN CLUB
ILLINOIS VALLEY NEWS
ILLINOIS VALLEY SWCD
ILLINOIS VALLEY VISITOR CNTR
INDEPENDENCE MINING COMPANY
PETER V. O'CONNOR
INDIAN HILL LMTD PARTNERSHIP
IV PUBLIC INPUT COMMITTEE
JOAN M. JANKOWSKI
PAULINE JAWORSKI
CLIFF JOHAMM
MAURICE_T. JORDAN
JOSEPHINE COUNTY AIRPORT
JOSEPHINE COUNTY COMMISSIONERS
JOSEPHINE COUNTY FORESTRY
BRAD KAHTA
KALMIOPSIS AUDUBON
ALFRED & DIANA KAMPS
CHRIS KAYES
MEGAN KEANE
LOREN & JANICE KEE
KATE KELLER
MARK K KELZ
BOB KENDALL
CLEVE KENDALL
GARY CRAIG & KIM MARIE FILLMORE
PATRICIA KLUBRUCK
JILL BELLEW KOBSON
MATT KOELKER
J. KOFSKY
STEVE KRISA
JOHN G. KUHN
RICHARD KUST
ALICIA LAFONTAINE
GEOFF LAHEY
BOB LAMBETH
ALIA LAMBORN
DR. FRANK LANG
STANLEY L LARSON
JEREMY LATHAM
SHANE LATIMER
SPENCER LENNARD
SHELDON & GRO LENT
L. F. LESEMAN
DONN & KARIN LESON

ANNA LICKUAR
DAVID LIMPER
KATHY LOMBARDO
SANDY LONSDALE
JENNY L LUNDIN
GORDON R & NANCY W LYFORD
SUZANNE M.C.SCHREIBER
PETER MACAVSLAND
JOHN MACKIN
DAVE & ANN MALONE
MARIA NOEL MANDILE
YVONNE MANQUEZ
RICHARD L. MARKS
V. MASSE
CHRIS MATTHEWS
FLORA MCCALL
MOLLY MCCLURE
CHRIS MCCORMICK
CAROL MCDONALD
CHRIS MCGINNIS
MARILEE MCLEAN
R.KURT MENNING
BILL P MICSAN
BRYAN MIKA
K MITCHELL
CYNTHIA MOODY
ANDREW MOORE
JEANNE MOORE
MARDELL MOORE
RUTH P. MORAN
DOROTHY C MULLENNEAUX
MINDY MULLET
JAMES J MULLINS
DAVE MURPHY
PATRICIA MURPHY
JOYCE MYERS
GARY NAT. BORN CITIZEN
NATIONAL WILDLIFE FED
NATIVE PLANT SOCIETY
MS. FLORENCE N. NEWBERRY
DEBORAH NEWELL
HERB NICHOLS
JAMES H & CAROL NOLAN
NORTHWESTERN UNIVERSITY
SARAH O'BRIEN
PETER V O'CONNER
STUART O'NEILL
ANDREW OAKLEY
ODOT
SANDIE OGAZ
ROBERT_N OLIVERIA
TED OLSEN
DONALD J. ORAHOOD
OREGON CAVES NATIONAL PARK
OREGON DEPARTMENT OF ENERGY
OREGON STATE PARKS
ELIZABETH ORR
VICTORIA L OSBORNE
KIRSTEN OWENS
PACIFIC POWER
MARY PAETZEL
DONNA PAINTER
BARBARA PARCHIM
A.G. PARKER
CHANNING PARKER
RICHARD J. PATRICK
CHRISTOPHER PERAULT
MICHAEL A. PERNICKA
LINDA PERRY
DORETHA PETERS
BETH PETERSON
EVERETT PETERSON
CLIFFORD & ROBERTA PHILLIPS
MYRTLE F PHILLIPS
JULIE PICKRELL
CAROL PITTMAN
HOWARD PLACE
ELAINE PLAISANCE
RAINA POLIVKA
BOB POWNE
LYNN PRUZAN
Q. R.
CARA RANCOURT
AARON RAPPAPORT
TERRY RAYMER
RAYMOND & MARY REAMER
JOHN REESE
AL REITAN
STEPHANIE REYNOLDS
DORIS RHODES
MRS. SHIRLEY RICE
ORIS E. & GAYNEL N. RICHARDSON
HANS RILLING
JUNE RINGER
MAGGIE RIOS
KRISTINE ROBBINSSHERRY L. ROBERTS
ROGUE GROUP SIERRA CLUB
WILLIAM A. RORISON
ROSEBURG RESOURCES CO.
LINDA RUDE
MARK & JANE SAGESER
P. SCHAFER
SCOTT SCHMIDT
GARY SCHRODT
MARGARET SCHWAB
JOHN SEGEDY
AMANDA SEVIGNY
SHARON SHAY

AMANDA SHIFFIETT
JENNIFER SHOVLIN
VIRGINIA SIMMONS
RICHARD SIMPSON
SIS-Q MEADOWS_CAMP
SISKIYOU AUDUBON
SISKIYOU PROJECT
A.C. SLEIGHT
JACK E SMITH
BARRY SNITKIN
MEAGAN A SNODGRASS
LARRY SOLL
DARLENE SOUTHFORK
RICHARD SPOTTS
EDWIN G & BARBARA M SQUIRE
KIMBERLY ST. HLAUE
EMILY STALLINGS
RUSSEL STELLYHINE
PATRICIA STONE
JULIA STONEBURNER
MARTHA MILTON STOOKEY
NIGEL STRAFFORD
DAROL STREIB
RHONDA & DAVID SUMMERLIN
DAN SWANK
JOHN SWANSON
MAHSSA TAGHINIA
MELISSA TAYLOR
JOHN THOMPSON
KYMBREYNN THOMPSON
STEVEN TICHENOR
S. TIRION
ANNE-MARIE TOLMEE
LYNETTE TOTANS
TRIBAL GOVERNMENT OFFICES
DANA TRIPP
JO ELLEN TURIGLIATTO
ALAN TURNER
KARIN ULLIAN
JOHN BREGAR
US FISH AND WILDLIFE
MICK VAN COPPENOLLE
LINDSAY VAN METER
STANLEY & KATHERINE VEJTASA
JAMES,KATHLEEN & VINCE LOMBARDO
MELISSA WAGSTER
AMANDA WALEYAK
LEE & JOAN WALKER
STEPHEN WALKER
DONALD & LINDA WALLACE
GREG WALTER
JANET WARNER
S.C. WARNER
KEITH WARNER OFM
DARELL WARNOCK
WATER WATCH OF OREGON
HAZEL WEAVER
MICHAEL WEBSTER
THOMAS WELLER
CHRISTOPHER R WELLS
THOMAS R. WETHERALL
LORIANNE WHITE
SUSAN WHITESIDES
NELLIE WILDEY ET AL.
ANDREW M WILLIAMS
GERRY WILLIAMS
ADAM WILSON
JIM WOOD
GEORGE WOOTEN
BREE YEDNOCK
GREGORY C YOUNG
BARBARA YUSEF
FRANK ZERN
MARY & CODY ZOOK

APPENDIX A
INDEX OF ANALYSIS FILE REFERENCE DOCUMENTS

Analysis File Documents

Date	Subject	Author
3/16/92	Plan of Operations	Miner
12/17/92	Plan of Operations	Miner
8/10/93	Rough and Ready W&S River Study and Findings	Lunn
11/19/93	POO modifications	Miner
11/29/93	Letter acknowledging POO modifications	Zuschlag
6/21/94	Letter from Miner's Attorney-how to avoid EIS	Stephens
8/12/94	Appeal of decision to do EIS	Stephens
9/13/94	Letter to Stephens-no guarantee to avoid EIS	Zuschlag
11/20/94	RO Appeal decision	Ferraro
5/6/96	FOIA letter to Zuschlag	Ullian
6/10/96	Letter from miner-NOI	Miner
6/18/96	Letter to miner-receipt of NOI	Zuschlag
8/9/96	Letter from Stephens-status of POO	Stephens
8/14/96	Letter to Stephens-Surface Use Determination (SUD) completion date	Zuschlag
11/15/96	Letter from Stephens-what other POOs	Stephens
11/21/96	Letter to miner- more/better info. needed	Gauthier-Warriner
11/21/96	Letter about W&S River Assessments & LRMPs	Risburdt
12/18/96	Letter to Stephens status of S.U.D.	Lunn
1/6/97	Letter to Stephens-forwarded SUD	Gauthier-Warriner
1/23/97	Letter to miner-more/better info. needed	Zuschlag
1/27/97	Letter to Nature Conservancy	Gauthier-Warriner
1/31/97	Letter documenting Miner/FS POO meeting	Nolan
2/10/97	Letter from miner-clarifies 3 items	Miner
2/10/97	Letter from Stephens-will provide info.	Stephens
2/19/97	BLM Letter to miner-need POO	Kohrfhage
2/24/97	Letter to Stephens-SUD findings	Zuschlag
3/3/97	Letter to Stephens-need amended POO	Zuschlag
3/12/97	More info on size & location of sites	Miner
3/13/97	BLM Dear Concerned Citizen letter	Korfhage
3/19/97	Agreement that PA is reasonably accurate	Miner
3/19/97	Letter from miner-provides info to BLM	Miner
3/21/97	Letter from Stephens-phase 1 & 2 clarified	Stephens
3/25/97	NOI for Federal Register	Agpaoa
3/27/97	Letter forwarding NOI to Federal Register	Carkin
Spring 97	Voice of Wild Siskiyou article	Ullian
Date	Subject	Author

4/2/97	Federal Register NOI	-
4/3/97	BLM letter-receipt of POO	Korfhage
4/97	Letter to Landowners about info. meeting	Zuschlag
4/9/97	Illinois Valley News article	-
4/21/97	Scoping letter	Zuschlag
4/23/97	Scoping News Release	Zuschlag
5/13/97	Landowner meeting notes	McLennan
6/97	West Fork Watershed Analysis	Desser
6/5/97	Letter from Stephens-what is status of EIS	Stephens
6/16/97	Letter to Stephens-proceeding with EIS	Zuschlag
6/26/97	Miners Notice of Intent	Miner
6/97	West Fork Illinois River Watershed Analysis-1.0	Zuschlag
8/18/97	Letter to Oregon Natural Heritage Program	Zuschlag
9/9/97	Dear Interested Citizen letter	Zuschlag
9/17/97	Project Initiation Memo	Desser
10/2/97	Letter to Powne	Zuschlag
10/17/97	S&G 7-1 Write Up	Mendenhall
11/6/97	Letter to Stephens-requesting more/better info	Zuschlag
12/10/97	Letter to Zuschlag-no more info	Stephens
1997	Cascdia Times Article	Ullian
-	Mailing Lists	-
-	Letters resulting from Scoping	-

Specialist Reports

Physical Science Report
Best Management Practices Selected for this project
Botanical Assessment
Fish, Wildlife, and Aquatic Conservation Strategy Review
Alternative Stockpile Site Map and Memo
Port-Orford-cedar Containment Strategy
Visuals, Recreation and Interpretive Development
Road Access Documentation
Alternative Component Cost Estimates
Misc. GIS Maps and Reports
Minerals Technician's Memos
Cultural Resource Assessment
Air Quality Assessment
Economics Report

Laws, Regulations, Policies and Plans

General Mining Law of 1872
Organic Administration Act of 1897
Mining and Minerals Policy Act of 1970
Federal Land Policy and Management Act of 1976
36 CFR 228
43 CFR 3809
Amended Forest Plan, Siskiyou NF
District Management Plan, Medford District BLM
Forest Service Manual 2800

APPENDIX B
GLOSSARY OF ACRONYMS AND SELECTED TERMS

ACEC - An "Area of Critical Environmental Concern", as defined in Resource Management Plans for the Medford District of the Bureau of Land Management.

Administrative Study Area - An "Administrative Study Area" is part of a land allocation determined in the FS Management Plan.

Alluvial Fans/Flats - "Alluvial Fans/Flats" are fan-shaped deposits formed by streams.

BLM - Refers to either the large Bureau of Land Management Agency as a whole or the Medford District as a part of the Agency.

Braided Channel - A channel that divides into or follows a tangled network of several small branching and reuniting shallow channels.

CFR - The "Code of Federal Regulations" which direct activities of Federal Agencies.

Channel Morphology - The channel pattern and the channel geometry at several points along a channel, including the network of tributaries within a drainage basin.

DEIS - A "Draft Environmental Impact Statement" as defined by the Council on Environmental Quality (CEQ).

Extirpate - To totally remove or destroy.

FEIS - A "Final Environmental Impact Statement" as defined by the Council on Environmental Quality (CEQ).

FS - Refers to either the large Forest Service Agency as a whole or the Siskiyou National Forest as a part of the Agency.

Inspiration Mining Company - A large multi-national mining company headquartered in Miami, Arizona.

Key Watershed - "Key Watershed" is land allocation defined in the Northwest Forest Plan.

Land Allocation - A "Land Allocation" refers to a process in the BLM Resource Management Plan and the FS Forest Plan. Each allocation is associated with particular management objectives, standards and guidelines.

Laterite Soil - The term "laterite soil" refers to a reddish colored soil which is high in iron content.

Lower Gradient - Lower gradients, compared to other stream channels with higher gradients, affect changes in tream characteristics. These usually include increased sinuosity, and a tendency towards unrestricted reaches.

MA - A "Management Area", as defined in the Amended Land and Resource Management Plan for the Siskiyou National Forest.

Macro-invertebrate - Macro-invertebrate refers to small organisms with no backbone that can be seen with the naked eye.

Matrix - "Matrix" is a land allocation coming from either of the Agency's Management Plans.

Mendenhall Fireline - The "Mendenhall Fireline" is a fireline constructed in the effort to control the Mendenhall Fire of 1996.

Monitoring - "Monitoring" is sampling situation to determine if requirements have been completed, if objectives were met, and if desired condition is realistic.

Montane - Areas typified as mountainess.

NMFS - An abbreviation for the National Marine Fisheries Service, a Federal Agency.

Noxious Weed - A "Noxious Weed" is a plant specified by law as being especially undesirable, troublesome, and difficult to control.

Oregon Natural Heritage Program - The "Oregon Natural Heritage Program", also known as ONHP, maintains databases for plant species in the State of Oregon.

ORV - The "Outstandingly Remarkable Values" as defined by the Wild and Scenic Rivers Act.

Peridotite - Rocks containing olivine and peroxene; see also ultramafic.

PETS - An abbreviation for Proposed, Endangered, Threatened, and Sensitive species of plants and animals.

POC - POC is an abbreviation for the tree species, Port-Orford-cedar.

POC Root Disease - A disease, whose scientific name is *Phytophthora lateralis*.

Phytophthora lateralis - A disease pathogen, commonly referred to as POC Root Disease.

POO - The mining "Plan of Operation", as defined by 36 CFR 228.

Riparian Reserve - "Riparian Reserve" is a land allocation described in the Northwest Forest Plan.

Reclamation - "Reclamation" is the process of restoring disturbed areas to an acceptable condition.

Roadless Area - "Roadless Areas" are areas identified in a second process in 1977, called Roadless Area Review and Evaluation (RARE II). The RARE II process identified areas of 5000 acres or more which were thought to be roadless and undeveloped, recommended to Congress areas for inclusion in the National Wilderness Preservation System, and culminated in an FEIS.

Rough and Ready Wayside - The "Rough and Ready Wayside" is an area designated by the State of Oregon along Highway 199 and near an area of proposed NICORE activity.

Savannah Habitats - Grasslands with scattered trees grading into a woodland.

Scoping - "Scoping" is a process defined by the Council on Environmental Quality and directs Federal Agencies regarding identification of significant issue with the Proposed Action.

Seral - "Seral" is transitory or developmental stage of a biotic community.

Substrate - The substance, base, or nutrient on which, or the medium in which, an organism lives and grows, or the surface to which a fixed organism is attached.

Surface Use Determination (SUD) - A "Surface Use Determination is the process used to assure a Federal Agency that the surface disturbance proposed in a Plan of Operation is indeed necessary to support a mining proposal. It is also known as a SUD.

Taxonomical - The identifying, classifying, and naming of organisms.

Ultramafic Rocks - "Ultramafic Rocks" are composed chiefly of iron-magnesium silicates, metallic oxides and sulfides and are typified as serpentine, olivine, or pyroxene.

Unrestricted Reaches - A channel or stream with flood flows that can expand unconfined or unrestricted horizontally, or to the sides, as the water level and/or streamflow increases.

USGS - The "USGS" is the United States Geological Survey, a Federal Agency.

Wing and Ferren Ditch - The "Wing and Ferren Ditch" is a small ditch constructed and used by a private individual serving to transport water from an impoundment on Rough and Ready Creek, across Forest Service managed lands, to private property.