RAND PROJECT

RANDSBURG, KERN COUNTY, CALIFORNIA

DRAFT
ENVIRONMENTAL IMPACT STATEMENT/
ENVIRONMENTAL IMPACT REPORT

VOLUME I
(CHAPTERS 1 THROUGH 13)

State Clearinghouse Number 93042054

OCTOBER 1994

County of Kern
Planning Department
Bakersfield, California

Bureau of Land Management
Ridgecrest Resource Area
Ridgecrest, California

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DRAFT ENVIRONMENTAL IMPACT STATEMENT/ ENVIRONMENTAL IMPACT REPORT VOLUME I

US Department of the Interior, Bureau of Land Management, California Desert District, Ridgecrest Resource Area

County of Kern, California

Environmental Impact Statement Number CA065-NEPA94-04
State Clearinghouse Number 93042054

Abstract:

The Rand Project is the extension of the life of existing mining operations at Rand Mining Company's (RMC's) Rand Mine, for an additional nine (9) to ten (10) years, which would result in the mine operating until approximately 2006, with mining occurring at the existing rate of an average 45,000 tons per day and use of new facilities to process the ore; the continuation of the existing water use for an additional nine (9) to ten (10) years; the continuation of associated exploration activities; the implementation of wildlife impact reduction measures; and the implementation of reclamation activities, all located in eastern Kern County, California. The project area (private and public lands under RMC's direct and indirect holdings) is comprised of 2,520 acres, with the public lands administered by the Bureau of Land Management. Precious metals, mainly gold, would continue to be recovered from the ore using conventional heap leach methods. At the completion of the mine operations, approximately 511 acres would have been disturbed by the Rand Project, in addition to the approximately 761 acres which has been disturbed by previously approved RMC operations. Issues identified during the public scoping process, evaluated and analyzed in this document include geology, topography, wildlife, vegetation, water resources, air quality, visual resources, socioeconomics and noise. Potential impacts would be mitigated by the project design or as a modification of the Proposed Action to prevent unnecessary and undue degradation. Additional mitigation may be related to specific conditions of approval associated with the approval of the Conditional Use Permit, Plan of Operations, Report of Waste Discharge and Authority to Construct.

Action Required:

Kern County: Approve Conditional Use Permit for a mining operation and Reclamation Plan

Bureau of Land Management: Approve Plan of Operations and Reclamation Plan

RAND PROJECT
KERN COUNTY, CALIFORNIA

DRAFT ENVIRONMENTAL IMPACT STATEMENT/
ENVIRONMENTAL IMPACT REPORT
State Clearinghouse No. 93042054

LEAD AGENCIES:

U.S. Department of the Interior
Bureau of Land Management
Ridgecrest, California

County of Kern
Bakersfield, California

PROPOSED ACTION: Construction and expansion operation of the Rand Project, a proposed expansion and construction of an open pit heap leach gold mine.

ABSTRACT: The U.S. Bureau of Land Management (BLM) issued a Notice of Intent on April 6, 1993, to prepare an Environmental Impact Statement (EIS) for the Proposed Action. On April 14, 1993, the County of Kern (County) issued a Notice of Preparation of an Environmental Impact Report (EIR). In accordance with the National Environmental Policy Act and the California Environmental Quality Act, the BLM and County are preparing a joint EIS/EIR. The Proposed Action would use conventional heap leach processing to recover disseminated gold from ore recovered from an open pit excavation. Ore would be processed at a rate of approximately 6 million tons annually for approximately 10 years. At its completion, approximately 511 acres of land would be disturbed by this proposal.

Reclamation of disturbed areas would occur concurrently with operations. Decommissioning of the site and final reclamation would occur for about 1-2 years after completion of operations. Including construction and reclamation, the total project life would be about 12 years. Four alternatives to the Proposed Action are analyzed in detail in the Draft EIS/EIR: (1) the No Action Alternative; (2) Facility Location Alternative (3) Reduced Project Alternative (4) Partial Backfilling. Numerous other alternatives were examined and eliminated from detailed consideration. Issues identified through the scoping process and evaluated in this Draft EIS/EIR include topography, geology and soils, water resources, vegetation, wildlife, air quality, land use, visual resources, cultural resources, transportation, noise, socioeconomics, and environmental health and safety.

Potential impacts to resources are either mitigated through project design or through recommended modifications to the proposed action.

REVIEW: This Draft EIS/EIR is being distributed for a 60-day public review and comment period.

Comments should be submitted by December 20, 1994, either to the Bureau of Land Management or County of Kern at the following address:

BLM-Ridgecrest Resource Area
300 S. Richmond
Ridgecrest, CA 93555
(619) 375-7125

Attn: Ahmed Mohsen

County of Kern
2700 M Street, #100
Bakersfield, CA 93301
(805) 861-2615
(805) 861-2061 (Fax)
Attn: Planning Dept. (Bill Larsen)

The BLM will hold a public meeting to hear comments on this document at 6:30 p.m. on December 7, 1994, at the following location:

Johannesburg Community Center
US Hwy 395
Johannesburg, California
This document has been approved for public review.

Lucia Kruger for
Henri R. Bisson
District Manager, California Desert District
Bureau of Land Management

October 7, 1994
Date

William L Larsen
William Larsen AICP, Senior Planner
Kern County Planning Department

OCTOBER 10, 1994
Date

Notice of Completion *Supplementary Document M*

Mail to State Clearinghouse, 1400 Tenth Street Sacramento, CA 95814 916/445-0613

See Note Below

SCH # 93042054

Project Title: *EA 23-92; CUP 4, Map 115; CUP 8, Map 115-35; CUP 9, Map136 (Rand Project)

| Agency: Kern County Planning Department | Contact Person: Bill Larsen
et Address: 2700 M Street, Suite 100 | Phone: 805/861-2615
City: Bakersfield, CA Zip: 93301 | County: Kern

Project Location: County: Kern City/Nearest Community: *Randsburg

Cross Streets: *Randsburg Avenue Zip Code: * Total Acres: *1020

APN # *182-100-03 Section *34,35,1,2,3 Twp. *29S, 30S Range *40E Base *MDBM

Within 2 miles:

State Hwy # *395 Waterways *

Airports * Railways * Schools *

Document Type

CEQA ☐ NOP ☐ Early Cons ☐ Neg Dec ☒ Draft EIR ☐ Supplement/Subsequent ☐ EIR (Prior SCH#)________ ☐ Other________

NEPA ☐ NOI ☐ EA ☒ Draft EIS ☐ FONSI ☒ Joint Document ☐ Final Document ☐ Other________

Local Action Type

☐ General Plan Update ☐ General Plan Amendment ☐ General Plan Element ☐ Community Plan ☐ Specific Plan ☐ Master Plan ☐ Planned Unit Development ☐ Site Plan ☐ Rezone ☐ Prezone ☒ Use Permit ☐ Land Division (Subdivision,Parcel Map, etc.) ☐ Annexation ☐ Redevelopment ☐ Coastal Permit ☐ Other________

Development Type

☐ Residential: *Units*________ *Acres*________

☐ Office: *Sq.Ft.*________ *Acres*________

☐ Commercial *Sq.Ft.*________ *Acres*________ *Employees*________

☐ Industrial *Sq.Ft.*________ *Acres*________ *Employees*________

☐ Educational ________

☐ Recreational________

☐ Water Facilities: *Type*________ *MGD*________

☐ Transportation: *Type*________

☒ Mining: *Mineral* GOLD / SILVER

☐ Power: *Type*________ *Watts*________

☐ Waste Treatment: *Type*________

☐ Hazardous Waste: *Type*________

☐ Other________

Project Issues Discussed in Document

☒ Aesthetic/Visual ☐ Agricultural Land ☒ Air Quality ☒ Archeological/Historical ☐ Coastal Zone ☒ Drainage/Absorbtion ☒ Economic/Jobs ☐ Fiscal ☒ Flood Plain/Flooding ☐ Forest Land/Fire Hazard ☒ Geologic/Seismic ☒ Minerals ☒ Noise ☐ Population/Housing Balance ☐ Public Services/Facilities ☐ Recreation/Parks ☐ Schools/Universities ☐ Septic Systems ☐ Sewer Capacity ☐ Soil Erosion/Compaction/Grading ☐ Solid Waste ☒ Toxic/Hazardous ☐ Traffic/Circulation ☐ Vegetation ☒ Water Quality ☒ Water Supply/Groundwater ☐ Wetland/Riparian ☒ Wildlife ☐ Growth Inducing ☒ Land Use ☐ Cumulative Effects ☐ Other________

Present Land Use/Zoning/General Plan Use

*Mining/NR (20), A1/8.4 (Mineral Petroleum), 1.1 (Non Jurisdictional Lands)

Project Description

*Cyanide Heap Leach Mining- Conditional use permit (CUP) applications to allow the expansion of four existing mining operations: Yellow Aster Mine, Baltic Mine, Lamont Mine, and Descarga Area. The proposed Rand Project will also consist of associated exploration activities, implementation of wildlife impact reduction measures, conducting reclamation activities as found in the reclamation plan, construction & maintenance of roads, & upgrading of existing water well field & pipelines. Specific components of the project include expansion of the 3 existing open pits (Yellow Aster, Baltic, & Lamont); development of associated satellite deposits; development of 2 waste rock stockpiles; development of 2 cyanide heap leach pads with associated solution ditches and ponds; development of 2 mineral recovery plants; & other ancillary facilities.

Note: Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. from a Notice of Preparation or previous draft document), please fill in.

Reviewing Agencies Checklist

KEY
S = Document sent by lead agency
X = Document sent by SCH
✓ = Suggested distribution

Resources Agency

____ Boating & Waterways
____ Coastal Commission
____ Coastal Conservancy
____ Colorado River Board
S Conservation /MINES & GEOL.
S Fish & Game /FRESNO
____ Forestry
____ Office of Historic Preservation
____ Parks & Recreation
____ Reclamation
____ S.F. Bay Conservation & Development Commission
S Water Resources (DWR)

Business, Transportation & Housing

____ Aeronautics
S California Highway Patrol
S CALTRANS District # 9
____ Department of Transportation Planning (headquarters)
____ Housing & Community Development

S **Food & Agriculture**

Health & Welfare

S Health Services FRESNO

State & Consumer Services

____ General Services
____ OLA (Schools)

Environmental Affairs

S Air Resources Board
____ APCD/AQMD
S California Waste Management Board
____ SWRCB: Clean Water Grants
____ SWRCB: Delta Unit
____ SWRCB: Water Quality
____ SWRCB: Water Rights
S Regional WQCB #____ (LAHONTAN)

Youth & Adult Corrections

____ Corrections

Independent Commissions & Offices

S Energy Commission
____ Native American Heritage Commission
S Public Utilities Commission
____ Santa Monica Mountains Conservancy
____ State Lands Commission
____ Tahoe Regional Planning Agency

S Other SHPO

Public Review Period (to be filled in by lead agency)

Starting Date OCTOBER 21, 1994 Ending Date DECEMBER 20, 1994

Signature [signature] Date 10-10-94

Lead Agency (Complete if applicable):

Consulting Firm: ____
Address: ____
City/State/Zip: ____
Contact: ____
Phone: (____) ____

Applicant: ____

Address: ____
City/State/Zip: ____
Phone: (____) ____

For SCH Use Only:

Date Received at SCH ____
Date Review Starts ____
Date to Agencies ____
Date to SCH ____
Clearance Date ____
Notes:

Revised October 1989

EXECUTIVE SUMMARY

RAND MINING COMPANY
RAND PROJECT
DRAFT ENVIRONMENTAL IMPACT STATEMENT/
ENVIRONMENTAL IMPACT REPORT
VOLUME I

EXECUTIVE SUMMARY

INTRODUCTION

Rand Mining Company (RMC) has proposed the development of the Rand Project, which is a proposal to extend existing operations at three (3) adjacent, approved, open-pit, heap-leach mine projects (known as the Yellow Aster Mine-Descarga Project, the Lamont Mine Project, and the Baltic Mine Project) by: mining additional gold and silver ore and waste rock at the current average operating rate of approximately 45,000 tons per day; the continuation of the existing water use for an additional nine (9) to ten (10) years; constructing facilities to process the additional ore and stockpile the additional waste rock; continuing associated exploration activities; and continuing implementation of wildlife impact reduction measures and reclamation activities. The project area consists of approximately 2,520 acres of unpatented lode and placer mining claims on public lands administered by the U.S. Bureau of Land Management, Ridgecrest Resource Area Office of the California Desert District (BLM) and private land. The BLM is the lead agency with respect to compliance with the National Environmental Policy Act (NEPA) and the Kern County Planning Department is the lead agency for compliance with the California Environmental Quality Act (CEQA).

The purpose of this document is to analyze the impacts of the two (2) identified reasonable alternatives, including the proposed project, so that decision-makers will have adequate information on which to base their decision to approve or deny the Rand Project or the other alternative. The decision will be made using, in part, the information presented in the Final Environmental Impact Statement/Environmental Impact Report (Final EIS/EIR). This Draft EIS/EIR has been prepared to describe the environmental impacts that would result from implementation of each of the alternatives. This Draft EIS/EIR for the Rand Project has been prepared in two (2) volumes which together comprise a stand-alone document. Volume I of the Draft EIS/EIR contains Chapters 1 through 13; and Volume II contains the appendices.

Background

The Rand Project 2,520-acre area of operations includes RMC's previously approved mining operations in the northeastern Rand Mountains. These operations include: the Yellow Aster Mine-Descarga Project area; the Lamont Mine; and the Baltic Mine, all of which are located within the project area boundary. RMC has also conducted exploration activities in this same area. RMC initiated activities in the Randsburg area in 1984 by acquiring the Yellow Aster Mine and developing a pilot test facility in the Descarga area. The Lamont Mine commenced operations in 1986, followed by the Yellow Aster Mine in 1989 and the Baltic Mine in 1993. RMC's mining and exploration activities are ongoing, and constitute the majority of mining activities currently being conducted in the northeastern Rand Mountains area. Approximately 761 acres of surface disturbance are associated with RMC's previously approved operations within the Rand Project area.

The objective of the Rand Project is to profitably mine ore, process this ore to recover precious metals, and reclaim the project area. The proposed operations are required to comply with the standards and procedures in the BLM regulations for surface mining of public land under the general mining law. These regulations recognize the statutory right of mineral claim holders to explore for and develop federal mineral resources and encourage such development. The proposed operations are also required to comply with the Surface Mining and Reclamation Act (SMARA) of 1975, which is applicable to all current mining operations located within the State of California. Kern County is the Local Lead Agency that will implement the SMARA Act. Identified Project impacts will be addressed as conditions of approval associated with Kern County's approval of the conditional use permit (CUP) and Reclamation Plan. These conditions will either appear as mitigation measures identified by this environmental document to avoid potentially significant impacts related to development of the project or as specific conditions of approval to ensure compliance with SMARA and Chapter 19.100 (Surface Mining Operations) of the Kern County Zoning Ordinance.

Project Location

The previously approved RMC operations and the proposed Rand Project area are located in eastern Kern County, California, approximately 40 miles northeast of Mojave, 25 miles south of Ridgecrest, and one (1) mile south of Randsburg, within Sections 34 and 35, Township 29 South, Range 40 East, and Sections 1, 2, 3, 10, 11, and 12, Township 30 South, Range 40 East, Mount Diablo Baseline & Meridian (MDB&M). RMC's existing groundwater production wells, which would also be used for the Rand Project, are located six (6) miles northeast of Koehn Lake in the northeast portion of the Fremont Valley in Sections 18 and 21, Township 29 South, Range 40 East and Section 12, Township 29 South, Range 39 East, MDB&M. The pipeline from these wells to the project area is located in Sections 12 and 13, Township 29 South, Range 39 East and Sections 17, 18, 20, 21, 27 and 28, Township 29 South, Range 40 East, MDB&M.

PROPOSED ACTION AND ALTERNATIVES

Proposed Action

The Rand Project is a proposal to extend existing operations at three (3) adjacent, active, open-pit, heap-leach mine projects by: mining additional gold and silver ore and waste rock at the current average operating rate of approximately 45,000 tons per day; the continuation of the existing water use for an additional nine (9) to ten (10) years; constructing facilities to process the additional ore and stockpile the additional waste rock; continuing associated exploration activities; and continuing implementation of wildlife impact reduction measures and reclamation activities.

The proposed Rand Project would consist of the following components: continued development and expansion of the three (3) existing open pits (Yellow Aster, Baltic, and Lamont); development of an associated satellite deposit; development and/or expansion of two (2) waste rock stockpiles; development of two (2) heap leach facilities; development of two (2) mineral recovery plants; and other ancillary facilities. Activities under the Proposed Action would commence in 1995, and would terminate in approximately 2006, extending the existing mine life by nine (9) to ten (10) years, reclamation activities would then commence until the year 2012. Sixty (60) million tons of ore would be leached on sites located in Lamont Valley and the Descarga area. Seventy-two (72) million tons of waste rock would be deposited at an expansion of the West Valley waste rock stockpile and the new Lamont Valley waste rock stockpile. Portions of the proposed Rand Project would occupy land that has been previously disturbed by both RMC's ongoing operations and by surface and underground mining and prospecting operations which began in the 1890's. The proposed Rand Project would encompass a maximum of approximately 511 acres of new surface disturbance associated with the expansion activities.

The construction of many of the ancillary facilities which would normally be required for a mining operation of the size and type of the Rand Project would not be necessary because RMC's existing ancillary facilities located within the project area would be utilized. Additional manpower requirements would be approximately eight (8) employees. The Proposed Action would result in the approximately $17,600,000.00 in current annual expenditures for payroll, taxes and local purchases continuing for an additional nine (9) to ten (10) years.

The reclamation goals of the Proposed Reclamation Plan are consistent with the land use goals for the area, which are future mining, wildlife habitat, recreation and sheep grazing. The post-mining goals and objectives for reclamation of the Rand Project area are to return the land to a similar land use, to ensure public safety, and to prevent unnecessary or undue degradation of the federal and private lands during operations and until reclamation is successful. The reclamation procedures proposed for the Rand Project incorporate six (6) basic components:

- Establishment of stable topographic surface and drainage conditions that are compatible with the surrounding landscape and serve to control erosion.

- Establishment of soil conditions most conducive to the development of a stable plant community through stripping, stockpiling and reapplication of suitable growth material.

- Revegetation of disturbed areas, using native plant species, in order to establish a long-term productive biotic community compatible with proposed post-mining land uses. The vegetative cover would be capable of self-regeneration without the long-term dependency on irrigation, soil amendments or fertilizers.

- Consideration of public safety through stabilization, removal, and/or fencing of structures or land forms that could constitute a public hazard.

- Minimization of the outward regrading or reshaping of slopes to reduce further impacts to undisturbed wildlife habitat.

- Consideration of the long-term visual character of the reclaimed area.

To accomplish this, RMC would reclaim the 511 acres of surface disturbance associated with the Rand Project, as well as 64 acres of existing disturbance from the Lamont and Descarga Projects not covered by existing SMARA reclamation plans. In addition, RMC would reclaim 37 acres of historic off-site surface disturbance in the surrounding area, probably in the Rand or El Paso Mountains.

Reclamation activities would be bonded by the BLM and Kern County and by the California Regional Water Quality Control Board - Lahontan Region (CRWQCB-LR). The CRWQCB-LR bond would be for the neutralization of the heap leach facility and would be in the amount of $2,063,012.50, as estimated by RMC. The reclamation bond, which would be held by the BLM and Kern County, would be in the amount of $432,682.50, as estimated by RMC.

<u>No Action Alternative</u>

The No Action Alternative would occur if either or both the BLM and/or Kern County rejected the Proposed Action and did not approve the Plan of Operations or Conditional Use Permit, which includes the reclamation plan for RMC's proposed (and some past) activities within the project area. As a result, RMC would be unable to conduct mining activities for the Rand Project as outlined in the Proposed Action. Development of the currently defined precious metal resource under the Proposed Action would not occur; however, existing operations would continue as presently approved.

The U.S. Department of Interior's surface mining regulations (43 CFR 3809) and current BLM policy contain provisions allowing for mineral exploration and extraction on public lands, as long as they are operated in an environmentally sound manner and do not cause unnecessary or undue degradation of the public resources. The BLM has the responsibility under the Federal Land Policy and Management Act and its regulations to ensure that appropriate state and federal laws, such as the Endangered Species Act and the National Historic Preservation Act, are complied with; that the proposed operation does not cause undue or unnecessary degradation of the federal lands; and that the operator provide for reclamation of disturbed areas. The BLM can disapprove the proposed project expansion and exploration activity only if it would violate statutory standards to prevent undue or unnecessary degradation. The BLM is then required to describe changes in the proposed activity needed to meet those standards.

AFFECTED ENVIRONMENT

Minerals History

The original Yellow Aster Mine was located in 1895 and operated until approximately 1942. Subsequent to the start of mining operations in the Rand Mining District, the Stringer Mining District was created from the south and eastern portions of the Rand Mining District. Gold producing operations within this district included the Baltic and others. RMC initiated activities in the Randsburg area in 1984 by acquiring the Yellow Aster Mine and developing a pilot test facility in the Descarga area. The Lamont Mine commenced operations in 1986, followed by the Yellow Aster Mine in 1989. RMC acquired the Baltic Mine Project in 1990 from Echo Bay Minerals and began operations in 1993. Since that time, exploration activities conducted by RMC have resulted in the delineation of additional ore reserves. These new reserves are present mostly within and adjacent to the Yellow Aster pit area, but are also present within and adjacent to the Baltic and Lamont open pits. One (1) additional satellite orebody is also present to the west of the Lamont open pit.

Physiography and Geology

The topography of the northeast portion of the Rand Mountains is rugged to rolling. Elevations range from 1,900 feet above mean sea level (AMSL) in Fremont Valley west of the project area to 4,741 feet AMSL at Government Peak on the western boundary of the project area. Topography of the project area consists of roughly east-west trending ridges with intervening valleys. The elevation of the project area varies from 3,300 feet AMSL in the northern portion of the project area to 4,741 feet AMSL at Government Peak.

The project is located in southeast California within the Mojave Desert Geomorphic Province of the Basin and Range Physiographic Province. The northeast portion of the Rand Mountains consists largely of the Atolia Quartz Monzonite of Mesozoic age and the Rand Schist of Precambrian Age (Clark, 1970). These units have been intruded or covered by Tertiary age volcanic rocks of andesitic, latitic and rhyolitic composition. Subsequently, clays, sandstones and conglomerates of the Paleocene Epoch mantled the older units at lower elevations on the east side of the project area. Quaternary alluvium has been deposited in the major valleys north and south of the project area.

The project is located in a structurally complex area. The Garlock Fault Zone is approximately six (6) miles northwest of the project area and the San Andreas Fault Zone is approximately 61 miles to the southwest. The project area is within a county-designated seismic hazard IV area. The 100-year maximum probable earthquake which could most significantly impact the project area would be a magnitude 7.0 earthquake on the Garlock Fault, with a probable peak acceleration (ground shaking) in the project area of approximately 0.35 gravity.

Soils

A soil inventory of the 2,520-acre project area identified and mapped 12 soil units (see Appendix C). Approximately 761 acres of surface disturbance currently exists as part of RMC's previously approved operations within the Rand Project area. From this disturbance approximately 130,000 cubic yards of topsoil have been stockpiled at various locations within the project area. The dominant soil map units identified from the mapping are generally representative of relic paleosoils which formed under moist conditions, as compared to the arid conditions of the current climate. Approximately 50 percent of the soils in the undisturbed portion of the project area have surface horizons of between three (3) and six (6) inches and a total soil depth of between ten (10) and 20 inches, and approximately 40 percent of the soils in the undisturbed portion of the project area have surface horizons of between six (6) and nine (9) inches and a total soil depth of between 20 and 40 inches.

Surface Water Hydrology

Drainages in the northeastern portion of the Rand Mountains are ephemeral, with creeks and drainages mainly fed by precipitation from winter storms and summer thunderstorms. The project area is located in the Golden Valley Basin and the Fremont Valley Basin. The calculated 100-year/24-hour storm event in the area is approximately 3.5 inches of precipitation (see Appendix E). Surface flows from precipitation events flow through the project area and are routed around certain process components. No site-specific information on the quantity of the surface flows is available. No springs or seeps are located in the project area.

The surface water quality is affected by the natural conditions of the area, as well as the ongoing mining operations and development activities. RMC has sampled and analyzed materials mined from the ongoing operations to assess the potential toxicity for those materials to affect surface water quality. All materials sampled have an excess basicity, as a result have a low acid generating potential and, therefore, are not likely to contribute acidic drainage to the surface waters. The Soluble Threshold Limit Concentration (STLC)-deionized water analyses of the waste rock and ore-grade materials for the Rand Project were below STLC values (see Chapter 2).

Groundwater Hydrology

Within the project area, previous mineral exploration drilling to a depth of 500 feet by RMC has not encountered any groundwater. No domestic water wells are located within or adjacent to the project area; however, two (2) wells, the Oasis and Airport wells, are located near the project area. The Oasis well is not used, and the Airport well is currently use for irrigation purposes. The nearest domestic water wells are located approximately six (6) miles northwest of the project area, northeast of Koehn Lake in the Fremont Valley. RMC presently has four (4) water wells which currently produce an annual average of 400 gpm.

Groundwater supply wells for the project are located northwest of the project area in the northeast Fremont Valley, in that area lying northeast of Koehn Lake. The Fremont Valley is a 200-square mile, northeast-southwest trending, structurally-controlled valley to the west and north of the project area. The valley is bounded on the southeast by the Rand Mountains, on the northwest by the El Paso Mountains, and on the northeast by a set of low hills. The elevation of the valley floor varies from 1,900 feet AMSL at Koehn Lake to approximately 3,300 feet AMSL on the alluvial fans adjoining the bordering mountain ranges. Groundwater storage capacity in 1976 for the entire Fremont Valley was estimated at 4.8 million acre-feet, and groundwater storage above the 500-foot depth, excluding the saline water under Koehn Lake, was about two (2) million acre-feet. The U.S. Geological Survey (USGS) has estimated the groundwater recharge in the area southwest of Koehn Lake in the Fremont Valley at 9,500 acre-feet per year from precipitation, runoff from the surrounding mountains and underflow from the southwest (Koehler, 1977). The U.S. Geological Survey (USGS) indicates that the area northeast of Koehn Lake does not receive any recharge from underflow and receives only a very small amount from stream runoff; therefore, nearly all the recharge is confined to the area southwest of Koehn lake.

Two (2) water districts are currently pumping potable water from the Fremont Valley: the Rand Communities Water District (RCWD) in the northeastern portion of the valley; and the Antelope Valley-East Kern Water Agency in the southwestern portion of the valley. The districts are separated by Koehn Lake, which is an ephemeral lake or playa. Groundwater use in Fremont Valley is predominantly from agricultural users southwest and, to a lesser degree, immediately northeast of Koehn Lake. Water use from the aquifers northeast of Koehn Lake also includes the existing RMC wells, the RCWD wells, and other mineral development operation wells to the southeast of the RMC wells.

Wells drilled southwest of Koehn Lake typically yield 1,500 gpm (see Appendix E), while wells drilled northeast of Koehn Lake generally yield between 300 and 1,000 gpm. Based on measurements taken during the last four (4) years the depth to groundwater in the northeastern portion of the Fremont Valley ranges from 240 to 560 feet below ground surface (bgs). Static water levels in well RMC #4 and the RCWD wells during April, 1994 ranged from approximately 325 to 375 feet bgs. The groundwater gradient in the northeastern portion of the Fremont Valley is variable due to variations in aquifer characteristics, but in general is to the southwest at approximately 0.03 feet per foot. The northeastern portion of the Fremont Valley can be considered an isolated portion of the overall Fremont Valley groundwater basin.

RMC currently pumps an annual average of approximately 400 gpm (576,000 gpd) from their wells for use in heap leaching and dust control at their Yellow Aster, Baltic, Lamont and Descarga facilities. During hot summer months, when water consumption is highest, production increases to an average of 580 gpm. In cool winter months, production falls to as low as 220 gpm. As water consumption from these existing RMC operations would be expected to decrease beginning in fiscal year 1997, these operations would be expected to consume an average of approximately 190 gpm for the remaining 6-year mine life. The two (2) RCWD wells, located approximately two (2) miles south of RMC well #4, pump at approximately 100 gpm for ten (10) hours per day (60,000 gpd). The RCWD operates only one (1) well at a time, alternating wells on a monthly basis. The RCWD wells are completed with screened intervals from 300 to 547 feet bgs and from 450 to 590 feet bgs in wells RCWD-1 and RCWD-2, respectively. The pump for RCWD-2 is set at approximately 450 feet bgs and it is assumed that the pump in RCWD-1 is also set at 450 feet bgs.

As many as six (6) agricultural irrigation wells located immediately to the northeast of Koehn Lake and approximately five (5) miles southwest of the RMC wells are also presently producing groundwater. These wells produce an average of 5,000 gpm (7,200,000 gpd). In addition, there are other wells in the northeast portion of the Fremont Valley which produce for mining operations. A well located in the NE¼ of Section 21, Township 29 South, Range 40 East, MDB&M, is intermittently used by Boral Resources for their asphalt plant; the well produces approximately 21 gpm (30,000 gpd). The four (4) wells located in the NW¼ of Section 22, Township 29 South, Range 40 East, MDB&M are used by Consolidated Placer Dredging for their placer mining operation; three (3) of the four (4) wells produce a total average of approximately 150 gpm (216,000 gpd). The potential recharge of CPD is 75 percent of the total pumpage by their three (3) wells. Therefore, CPD operations have a net potential groundwater usage of approximately 37.5 gpm. All other wells have intermittent, minor production.

Over the period 1958 to 1976, groundwater levels in the aquifers in the southwestern portion of Fremont Valley fell a maximum of 240 feet due to the large use of groundwater for agricultural activities. The northeast part of the Fremont Valley is not utilized as extensively for agriculture, and historical water level data has showed lower rates of water table decline. Limited data from northeastern Fremont Valley wells indicates water table declines in the vicinity of well RCWD #1 of approximately 30 feet over 30 years, or approximately 1.0 foot per year between 1953 and 1976. After 1979, well RCWD-1 continued to decline at a rate of 1.0 foot per year, while well RCWD-2 declined at a rate of 3.0 feet per year.

Hydrologic modeling of the northeastern Fremont Valley was recently completed, and was performed to evaluate the impacts of RMC groundwater withdrawals, along with valley's other groundwater wells, on the northeastern Fremont Valley aquifer in general, and the RCWD wells in particular. Field investigations conducted for the modeling included water level measurements, and groundwater sample collection in June, 1993; drilling, constructing and developing a 1,007-foot deep observation well in May, 1994; and performing a 12-hour constant discharge aquifer test of RMC well #4. The modeling was performed on 6-year, 12-year and 16-year time periods using a MODFLOW numerical model. Four (4) case scenarios were deployed in the modeling: Case 1 evaluated the effects of the existing RMC groundwater production, assumed RMC pumpage ceased after six (6) years and did not include regional pumpage; Case 2 evaluated the effects of the proposed Rand Project groundwater withdrawals for a 16-year period and also did not include regional pumpage; Case 3 evaluated the effects of the existing RMC water production for six (6) years, in conjunction with regional pumpage continuing for 16 years; and Case 4 evaluated the effects of the Rand Project and regional pumpage over a 16-year period. Cases 1 and 3 are described in the following paragraphs concerning the affected environment; Case 2 is described more thoroughly in the environmental consequences discussion in Chapter 5; and Case 4 is described under the cumulative impacts discussion in Chapter 9.

The projected water table decline at the RMC well #4, based on the Case 1 existing groundwater withdrawals after six (6) years, was predicted to be 2.8 feet. The impact to the RCWD wells after six (6) years was predicted to be 1.3 feet; and 0.3 feet of decline attributed to RMC pumpage, after 16 years. Less than one (1) foot of drawdown was calculated at the remaining modeled wells in the northern Fremont Valley due to the existing RMC water withdrawal rates (Case 1). Modeling Case 3 indicated that, under current conditions which would have RMC ceasing groundwater production in six (6) years, drawdown at the RMC well #4 would be 41.7 feet after 16 years, while at the RCWD wells drawdown would be 44.4 feet after 16 years, due mostly to current pumpage from the valley's other existing wells. At the end of 16 years, 4.4 feet and 51.8 feet of drawdown was calculated at the Consolidated Placer Dredging (CPD) and agricultural wells respectively.

Because the static water level is approximately 70 feet above the pumps in the RCWD wells (Hambrick, 1994), the current rate of water table decline from RMC groundwater pumpage in the northeast Fremont Valley will not likely impact the production from the wells in the short to intermediate term.

Chemical data on the quality of groundwater in the northeastern Fremont Valley is limited, but indicates that three (3) types of groundwater are present which include: a magnesium-sulfate-type water and a sodium-magnesium-sulfate-type water in the portion of the aquifer north of the Garlock fault; a sodium-sulfate-type water and a sodium-bicarbonate-type water in the central portion of the area; and, a sodium-chloride-type water and a sodium-sulfate-type water in the southwestern portion of the area. Groundwater with high concentrations of dissolved solids is present but generally limited to shallow groundwater in the area of Koehn Lake. Measurements of dissolved solids from these waters are on the order of 50,000 to 100,000 ppm. Better quality groundwater, with lower concentrations of dissolved solids, is present below the lower quality groundwater in the area of Koehn Lake, as well as to the northeast and southwest of Koehn Lake. Measurements of dissolved solids from these waters are on the order of 500 to 1,000 ppm.

Meteorology and Air Quality

The climate of the area is characterized by hot, dry summers and mild, dry winters with local variations due to elevation and slope aspects. Temperature extremes can vary up to approximately 40° F throughout the year from the warmest average maximum temperature to the coldest average minimum temperature. Winters are cool with temperatures in the 50s during the day and dropping into the 30s or less at night. Summer temperatures can rise into the 100s during the day, approximately 66 days per year, and drop into the 60s at night. Maximum average rainfall in the Randsburg area is approximately 5.66 inches per year. Weather data collected at China Lake, located approximately 25 miles north of the project area, indicate that strong surface winds with a prevailing speed of 15 knots or greater can be expected 15 days per year. Strong gusts of 40 knots or more can be expected ten (10) days per year.

The air quality of the project area is generally good due to the limited population of the area, the absence of concentrated industrial activity and the lack of natural emission sources. PM_{10} is the main pollutant of concern and high winds or increased surface disturbance can elevate PM_{10} concentrations. Although no data are available for PM_{10} concentrations in the immediate project area, the existing RMC projects emit an estimated 124 tons per year of PM_{10} annually, essentially all of it from fugitive sources (see Appendix F). Air toxics emitted from the existing RMC projects have been conservatively assessed as potentially contributing to a maximum of 2.9 additional cases of cancer per one (1) million population (as measured over an assumed 17-year span of the proposed project), an increase which the Kern County Air Pollution Control District defines as not significant.

Vegetation and Range

The project area is located within the creosote bush scrub vegetation community. Common perennial species in this community include creosote bush, mormon tea, burrobush and blackbush. In addition, bladder sage, cholla, beavertail and articulated and non-articulated Joshua trees are present. A portion of the project area, extending from the westerly and southwesterly portions of the Rand Project boundary, is within the designated Rand Mountains/Fremont Valley Management Area (USDI, 1993).

Red Rock Poppy, a subspecies of the Little Golden Poppy and a Category 2 federal candidate species (Harris, 1994), was identified in three (3) locations in Section 1, Township 30 South, Range 40 East, MDB&M, within the Baltic area of operations in the early 1990's during years with above average precipitation. Because of the current drought conditions, the re-identification of these populations has been hampered;

however, the identification of the locations of populations of the Red Rock Poppy southeast of the Baltic Pit and Little Gold Poppy north of the mine offices have been made in 1994.

The project area is located entirely within the Cantil Common Allotment, which has been used for sheep grazing for approximately 130 years. Fifteen (15) permittees graze sheep in common in the allotment (Sjaastad, 1994). Because this allotment is an ephemeral allotment, the permitted use of the allotment varies year-to-year depending on the annual forage production. Grazing in the allotment was not allowed from 1989 through 1990 and 1992 due to below-average precipitation and, therefore, limited forage production and for desert tortoise protection. Grazing was allowed in the allotment during 1991 through 1993, but, only in that portion of the allotment north of the Garlock Road. The area south of the Garlock Road, which includes the project area, was excluded from grazing to protect desert tortoise habitat.

Wildlife

The various wildlife species which have been observed in this habitat are typical of the central Mojave Desert; they include resident and migrant birds, small mammals and reptiles. The dominant species include desert cottontail, desert woodrat, coyote, western pipistrelle bat, black-throated sparrow, common raven, red-tailed hawk, chukar, horned lark, barn owl, rockwren, western whiptail lizard, desert spiny lizard, desert tortoise, long-nosed snake, gopher snake and sidewinder.

Observations of sensitive wildlife species include desert tortoise (*Gopherus agassizii*) and Mohave ground squirrel (*Spermophilus mohavensis*). The desert tortoise is a Federal and State-listed Threatened species, and the Mohave ground squirrel is a Federal Candidate 2 species and State-listed threatened species. The Le Conte's thrasher, a state species of concern, was identified in the project area during a previous field investigation, but was not observed during the 1993 field study. Townsend's big-eared bat, a Federal Candidate 2 species, as discussed below, has also been identified in a few locations within the project area. Other Federal and state-listed threatened or endangered species or other sensitive species not identified in the project area, but known to occur in the region, include the golden eagle, ferruginous hawk, northern harrier, prairie falcon, burrowing owl and American badger. None of the biological surveys have indicated the presence of migratory waterfowl. Since 1988, RMC personnel have observed only a few migratory birds at their existing operations. The project is not located on a migratory bird fly-way.

A survey for bats has been conducted over portions of the project area, which included the Baltic Mine area, Lamont Valley area and the West Valley area. One hundred thirty (130) mine openings were surveyed either by entering or observing the entrances after dusk. Of the mines entered (97), only three (3) had guano and none had bats. Of the mines observed (15), Townsend's big-eared bat exited from six (6) mines, small *Myotis* sp. flew in and out of several mines, and western pipistrelles were observed flying. During the survey the distinctive communication sound of pallid bats, a California Department of Fish and Game (CDFG) species of concern, was heard in the vicinity of the shaft in the West Valley area (see Appendix I).

An assessment of the Mohave ground squirrel habitat quality within the project was conducted since the project area lies within the geographic range of the State-listed threatened Mohave ground squirrel. There are, however, no specific studies that provide information on the density of Mohave ground squirrel in the project area. Mohave ground squirrel have been observed on the project area, though none were observed during the 1993 studies (see Appendix H). Mohave ground squirrel may potentially occur on those portions of the project area that are vegetated, and assuming an average density of 15 to 20 animals per square mile, between 24 and 32 individuals may reside on the project area.

A total of 15 live desert tortoise, 22 carcasses (including disarticulated animals), nine (9) skeletal fragments, 89 burrows/pallets, and 16 scat were observed. All observed live desert tortoise appeared to be in good health. Desert tortoise were widely distributed over the project area, but the distribution was uneven, with the highest concentration of tortoise sign and actual tortoises in the south portion of the project area, in Lamont Valley and the ridge to the south and southeast. The number of carcasses and skeletal fragments are disproportionately high compared to the number of live tortoise. This is probably due to avian predators bringing tortoise into the project area from low-lying areas, which is supported by the high number of carcasses observed on hilltops, ridgelines and steep slopes.

Cultural and Paleontological

A total of 213 historic sites are present within the project area (Parr and Swope, 1994). No prehistoric sites have been found. As documented, the majority of the sites in the area consist of prospect holes, shafts, or adits with low grade ore and/or waste rock piles. As a result of the poor condition of these sites and the limited amount of data they possess, the BLM has determined that none of these sites meet the criteria for inclusion to the National Register of Historic Places.

Visual

The BLM is currently managing the public lands within the project area with a visual resource management (VRM) rating of III. The landscape characteristics of the project area consist of a complex terrain of hills, ridges and valleys that support a creosote bush scrub vegetation community. The landscape color consists of browns, tans and grays. Vegetation colors are generally browns, greens, yellows and tans. Because of the limited vegetation cover, landscape colors meld with vegetation colors from distant view points.

The significant majority of the visitors to the project area are mine employees, contractors, other mine-related personnel and off-highway vehicle (OHV) users. Access to the actual mining operations in the Randsburg area has been limited by the company for safety and security reasons. The project area is not visible from any recreation areas and is only visible from a very limited view one (1) mile southeast of the project area for vehicles traveling north on U.S. Highway 395 and vehicles traveling south on U.S. Highway 395 in Fremont Valley (see Appendix J). Portions of the project area are also visible from County roads to the north and south of Randsburg, particularly for vehicles traveling south from U.S. Highway 395 into Randsburg. The project area is in the foreground to middleground for visitors on the local roads. Because mine employees and other related persons are the dominant potential viewers, and because of the limited recreational opportunities in the area to attract other viewers besides OHV users, the viewer sensitivity to the visual resources is currently considered to be low to slightly moderate.

Noise

The proposed project area is located in a sparsely populated rural area, with the nearest residences located approximately 500 feet east of the Descarga operations at Randsburg, approximately 3,000 feet southeast of the Baltic open pit at Dog Patch, and approximately 3,000 feet northeast of the Yellow Aster open pit in Randsburg. The principal existing sources of noise in the area are the existing mining operations at the Yellow Aster Mine, Lamont Mine and Baltic Mine operations, sonic booms from military aircraft, vehicle traffic on nearby roads, including U.S. Highway 395, and off-highway vehicle activity. Electrical powerlines, wind and, to a lesser extent, birds and rain showers contribute to the existing ambient noise level. The local terrain is complex, which produces areas in which the noise produced by blasting and large equipment from the existing mining and exploration operations may be sheltered or focused. The existing noise levels are elevated relative to what would normally be expected in a rural desert areas like the project area.

Current RMC mining operations result in identifiable noise patterns, which include engine noise and back-up alarms from haul trucks, engine noise from loaders and other vehicles, blasting, and miscellaneous equipment noise from the process plants, shop and offices. The haul truck engine noise is generally generated during the traveling from the open pits to the waste rock stockpiles and heap leach pads and back to the open pits. The haul truck back-up alarm noise is generally generated at the open pits, waste rock stockpiles and heap leach pads during the loading and unloading of material from the haul trucks. As a result, these noises are generated on a 24-hour per day basis. The noise from blasting occurs once per day, during daylight hours, from one (1) of the three (3) open pits. Noise from loader operations occurs when the haul trucks are filled with material from the open pits; therefore, the noise generation is from within the open pits on a 24-hour per day basis.

The noise generated by these existing operations is typical of most mining projects and could be intense, up to 95 dBA at 25 feet. Blasting can cause very short-duration noise levels in excess of 100 dBA at 25 feet. Assuming an average reduction of six (6) dBA when the distance from a noise source is doubled, the impacts to the nearest residences, which are approximately 500 feet east of the Descarga operations, can range from 63 to 76 dBA adjacent to the outside of the residential structure; and can be in the range for 50 to 60 dBA adjacent to the outside of the residential structures located approximately 3,000 feet northeast of the Yellow Aster open pit. This is a maximum noise level, because as operations progress, a majority of the equipment operations and blasting is occurring below grade in the open pits. The walls of the pits absorb some of the noise and tend to direct the rest of the noise upward, thus reducing the noise levels at the residences. Noise levels in the vicinity of Dog Patch, approximately 3,000 feet southeast of the Baltic open pit, are consistent with the Kern County Noise Element (see Appendix K). Some recreational users and other residents of the area, such as those in Randsburg, Dog Patch and Red Mountain, may be affected by blasting noise, but operational noise likely results in minimal impacts to the human environment.

Land Use and Wilderness

Land use within the project area consists of mineral exploration and development, public recreational use, wildlife habitat and livestock grazing. Mineral activities, wildlife habitat and livestock grazing have been discussed previously above. The project is located within the California Desert Conservation Area in a Class M multiple-use class area. In addition, the project area is located adjacent to and partially within the Rand Mountains/Fremont Valley Management Area (RMFVMA). The Mojave Desert Tortoise Natural Area (DTNA) is located approximately 11 miles southwest of the project area. The project area is also located to the southeast of and partially within the recently expanded Western Rand Area of Critical Environmental Concern (Western Rand ACEC). However, the only portion of the project area actually within the Western Rand ACEC is the existing pipeline right-of-way and RMC wells #1, #2, and #3, with continuation of ongoing pipeline maintenance, and no activities under the Proposed Action would occur within this area. In addition, the BLM is in the process of developing the West Mojave Coordinated Management Plan (Mojave Plan). The Rand Project is also located within lands to be covered by this plan. The Mojave Plan will be designed to manage critical habitat for the desert tortoise and the Mohave ground squirrel through the designation of seven (7) management areas. The management areas would be subdivided, based on four (4) zones of management activities. The Rand Project area is currently located within an area identified for the continuation of existing types of activities.

The BLM has issued a number of right-of-ways within and surrounding the project area (Hogan, 1994). These include a powerline withdrawal, a powerline right-of-way, two (2) telephone cable right-of-ways, and four (4) telephone line right-of-ways.

The project area is located in an area with Kern County zoning designation NR-20 (Natural Resource District, minimum 20 acres) and A1 (Limited Agriculture District), and the County land use map indicates a Resource designation. Uses allowed under this zoning and land use designation include general agricultural uses, residential uses, resource extraction and industrial uses. Mining activities are allowed in these zoning districts upon issuance of a Conditional Use Permit. One County secondary road and several minor roads cross the project area.

Public recreational use of the Rand Mountains area consists mostly of OHV use, by both individuals and OHV enthusiast organizations (Keeler, 1994). Numerous organized OHV events have been held around the area in the past; however, in recent years the number of these events has been reduced. The unorganized OHV casual use in the area has increased due to restrictive limitations in the surrounding areas. There are approximately 65 miles, or 120 acres, of OHV routes in the northeastern Rand Mountains that are currently used. The approval of the RMFVMA Plan in 1993 established a network of designated OHV routes within the RMFVMA. These designated routes total approximately 22 miles, or 40 acres, of road. Of the remaining 43 miles, or 80 acres, of routes approximately 38 miles, or 70 acres, will eventually be closed under the RMFVMA Plan. The Spangler Off Highway Vehicle Area is located approximate eight (8) miles north of the project area, on the east side of U.S. Highway 395.

Other recreational uses of the area include hunting for chukar, target shooting and minor miscellaneous recreational uses. The nearest public parks are the Johannesburg city park and the recreation area at the Red Rock Canyon State Park, located approximately 20 miles west of the project area.

The closest wilderness areas to the project area are the Death Valley Wilderness, which is approximately 50 miles to the northeast, and the Domeland Wilderness, which is approximately 50 miles to the northwest. In addition, there are 21 Wilderness Study Areas (WSAs) within 60 miles of the project area. The closest WSA to the project area is the Red Mountain WSA, which is approximately two (2) miles to the east. Under the current version of the California Desert Protection Act (CDPA) 13 of these 21 WSAs would be designated as wilderness areas. Of these 13 areas, the closest ones to the project area are the Golden Valley WSA and the EL Paso Mountains WSA, which are five (5) miles northeast and ten (10) miles northwest of the project area, respectively. The CDPA, in its current form, would also reclassify Death Valley as a National Park and expand its boundaries.

Socioeconomics

The nearest population center to the project area is the town of Randsburg, approximately one (1) mile north of the project area. Most services are obtained in Ridgecrest, approximately 25 miles north of the project site. Based on information obtained from the Ridgecrest Chamber of Commerce, Ridgecrest serves a population exceeding 38,000, which includes China Lake, Inyokern, Johannesburg, Randsburg, Red Mountain, Trona, Argus Westend, Kern River Valley Area and Owens Lake Area.

The economy of Ridgecrest has been based principally on support of the Naval Air Weapons Station (NAWS) at China Lake since its establishment in 1943. The NAWS and industries directly related to the NAWS are the major source of employment in the Ridgecrest area (RCC, 1993). Other employers in the area are manufacturing plants, tourism, mining and the government. The existing RMC operations employs approximately 140 individuals as regular employees for the mining, leaching, technical and administrative duties at the existing RMC operations. This provides a total annual payroll of approximately \$6,000,000.00. In addition, RMC pays approximately \$200,000.00 per year in property taxes. Approximately \$10,800,000.00 in operating and maintenance supplies are purchased from local vendors, and approximately \$600,000.00 of power is purchased from the electrical utility, which totals \$17,600,00.00 per year. These jobs and the amount of local expenditures result in secondary economic benefits through increased local service employment. Using the BLM's mining employment multiplier for the California desert area of 2.666, approximately 373 secondary jobs have been created as a result of RMC's existing operations.

Mining and processing operations are currently conducted 24 hours per day, seven (7) days per week, 365 days a year. Most of the salaried staff works one (1) shift per day, five (5) days per week. Thirty-two (32) employees (approximately 25 percent) live locally, in the towns of Randsburg, Johannesburg and Red Mountain. Eighty-seven (87) employees (approximately 60 percent) reside in Ridgecrest and commute to the mine site each day. The other 21 employees (approximately 15 percent) reside in other communities in the regional area and commute to the mine site each day. Because carpooling is prevalent in this area, there are approximately 40 trips per day between Ridgecrest and the other communities in the region and the project site. The traffic is spread over a 24-hour period. Currently the use of U.S. Highway 395 between Ridgecrest and the project area is approximately 4,000 vehicles per day. Traffic from RMC's existing operations is approximately 1.0 percent of the daily use of U.S. Highway 395.

Other Resources

The Proposed Action would not be located: in or adjacent to wilderness areas or WSAs; in an area of prime and unique farmland; in a floodplain; on a wild and scenic river; or in an area of traditional Native American religious concern.

ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION AND ALTERNATIVES, MITIGATION MEASURES AND UNAVOIDABLE EFFECTS

A summary of the potential impacts, mitigation measures, and unavoidable effects identified in this EIS/EIR are outlined in the following table. Detailed discussions of the potential impacts, identified mitigation measures and unavoidable effects are presented in Chapter 5, Environmental Consequences; Chapter 6, Mitigation Measures for the Proposed Action; and Chapter 7, Unavoidable Effects of the Proposed Action, of this EIS/EIR.

Summary of Potential Impacts of the Proposed Action and No Action Alternative, Mitigation Measures for the Proposed Action and Unavoidable Effects of the Proposed Action

RESOURCE	POTENTIAL IMPACTS OF THE PROPOSED ACTION	POTENTIAL IMPACTS OF THE NO ACTION ALTERNATIVE	MITIGATION MEASURES FOR THE PROPOSED ACTION[1]	UNAVOIDABLE EFFECTS OF THE PROPOSED ACTION
Mineral Resources	• Allow for easier access to deeper mineralization • Affect development of adjacent mineral occurrences •May cover undiscovered mineralization • Removal of 60 million tons of ore and 75 million tons of waste rock	• None of the impacts to mineral resources resulting from expanded mining operations and associated reclamation, including none of the precious metal that would be recovered under the Proposed Action	• No recommended mitigation measures	• Permanent removal of 60 million tons of ore
Physiography and Geology	• Disturb approximately 511 acres • Enlarge existing open pits by 132 acres • Permanent alteration of topography • Facilities potentially affected by seismic activity	• None of the impacts to physiography and geology resources resulting from expanded mining operations and associated reclamation, including none of the reclamation of the pre-RMC historic surface disturbance that would be conducted under the Proposed Action	• No recommended mitigation measures	• Permanent change in topography
Soils	• Disturbance of 511 acres of soil • Erosion during and after mining and reclamation operations • Loss of some soils by incorporation in waste rock stockpiles or burial under waste rock stockpiles and heap leach pads	• None of the impacts to the soil resources resulting from expanded mining operations and associated reclamation would occur	• Surface disturbance shall be the minimum required to construct and operate the project • Topsoil stockpiles shall be designed to minimize the potential of water and wind erosion & have low relief profile • Topsoil stockpiles shall be seeded with a nitrogen-fixing species in the first year of creation	• Some erosion of stockpile and reclaimed surfaces • Permanent burial of lower portions of soil profiles

RESOURCE	POTENTIAL IMPACTS OF THE PROPOSED ACTION	POTENTIAL IMPACTS OF THE NO ACTION ALTERNATIVE	MITIGATION MEASURES FOR THE PROPOSED ACTION[1]	UNAVOIDABLE EFFECTS OF THE PROPOSED ACTION
Hydrology Surface Water	• Minimal sedimentation of ephemeral surface waters • Potential for dilute process waters to be released from process ponds during extraordinary storm event (1,000 year-24 hour event)	• None of the impacts to surface water resources resulting from expanded mining operations and associated reclamation	• Roads shall be crowned and water bars shall be constructed to minimize erosion and sediment production • Topsoil stockpiles shall be seeded with a nitrogen-fixing species or used as test plot sites • An erosion and sedimentation plan shall be developed and shall be subject to review and approval by the BLM and Kern County in order to minimize sedimentation resulting from surface water impacts.	• Some erosion and sedimentation
Groundwater	• Additional watertable decline in the vicinity of RMC #4 of approximately 5.5 feet after 16 years • Additional watertable decline in the vicinity of the RCWD wells of approximately 4.1 feet after 16 years • Potential to degrade unknown groundwater in project area • Consumption of an average of 345 gpm for 16 years	• None of the impacts to the groundwater resources resulting from expanded mining operations and associated reclamation	• If continued pumping results in any unexpected indications of impacts to pumping capabilities of adjacent wells, an expanded monitoring program shall be developed and implemented, followed by corrective action plan	• Consumption of groundwater
Meteorology and Air Quality	• PM_{10} emissions from surface disturbing activities, mining and ore processing operations • An increase in the emission of air toxics (principally associated with the PM_{10} emissions) • An increase in the calculated individual cancer risk (MICR) to the surrounding population from 2.9 in a million to 7.24 in a million (a level which is still defined by the KCAPCD as not significant).	• None of the impacts to air resources resulting from expanded mining operations and associated reclamation	• Disturbed surfaces no longer needed for project activities shall be timely reclaimed • Program to minimize fugitive dust emissions	• TSP/PM_{10}/air toxics emissions during operations

RESOURCE	POTENTIAL IMPACTS OF THE PROPOSED ACTION	POTENTIAL IMPACTS OF THE NO ACTION ALTERNATIVE	MITIGATION MEASURES FOR THE PROPOSED ACTION[1]	UNAVOIDABLE EFFECTS OF THE PROPOSED ACTION
Biology Vegetation Resources	• Disturb 511 acres of creosote bush vegetation community • Permanent loss of 132 acres of vegetation community	• None of the impacts to the vegetation resources resulting from expanded mining operations and associated reclamation	• Minimize additional surface disturbance, including new roads, by accessing drill targets by overland travel • Salvage and stockpile juvenile joshua trees, golden cholla and beavertail • Provide opportunities for nurseries and others to salvage all other joshua trees prior to construction activities • Monitoring and reporting of any previously undiscovered Red Rock Poppy populations shall be conducted in accordance with standard BLM procedures during the ongoing vegetation monitoring under the Proposed Reclamation Plan	• Short-term and long-term loss of vegetation
Range Resources	• Disturb 511 acres with a potential grazing capacity of 200 to 5,000 lb/acre of forage • Exclude grazing from project area during project life • Permanent loss of 132 acres from grazing use	• None of the impacts to the range resources resulting from expanded mining operations and associated reclamation	• No recommended mitigation measures	• Short-term and long-term loss of forage

RESOURCE	POTENTIAL IMPACTS OF THE PROPOSED ACTION	POTENTIAL IMPACTS OF THE NO ACTION ALTERNATIVE	MITIGATION MEASURES FOR THE PROPOSED ACTION[1]	UNAVOIDABLE EFFECTS OF THE PROPOSED ACTION
Wildlife Resources	• Direct disturbance to 511 acres of creosote bush scrub habitat • Indirectly affect approximately 2,500 acres of habitat through animal avoidance • A probable incidental take of five (5) desert tortoise through direct mortality and 26 through incidental harassment • Assumed displacement of Mohave ground squirrels from disturbed areas • Wildlife mortalities	• None of the impacts to the wildlife resources resulting from expanded mining operations and associated reclamation, including the anticipated mitigation measures to enhance desert tortoise habitat	• Implement terms and conditions in USFWS biological opinion for protection of desert tortoise and mitigation measures in 1993 biological assessment for protection of Mohave ground squirrel • Impacts shall be minimized by disturbing only that area required to construct and operate the project • Proposed construction and operations shall utilize existing roads and previously disturbed surfaces • OHV traffic shall be restricted in the project area • Shafts shall be fenced or cleared of bats prior to filling • All employees shall be responsible for reporting wildlife mortalities. Monitoring and notification of mortalities shall be submitted to the BLM • Measures shall be taken to immediately mitigate impacts relating to pooling/puddling of cyanide solution • Cyanide solution shall be covered to exclude wildlife • Heap leach pads shall be inspected for conditions which may be used by perching birds and the conditions shall be altered • An alternative fresh water source shall be constructed • Upon notification by the BLM, RMC shall provide access to the project by representatives of the BLM	• Short-term and long-term loss of habitat and individual animals

RESOURCE	POTENTIAL IMPACTS OF THE PROPOSED ACTION	POTENTIAL IMPACTS OF THE NO ACTION ALTERNATIVE	MITIGATION MEASURES FOR THE PROPOSED ACTION[1]	UNAVOIDABLE EFFECTS OF THE PROPOSED ACTION
Cultural Resources	• Direct or indirect impact to 74 historic sites, none of which were judged to be eligible for the National Register • Potential to impact unknown cultural resources	• None of the impacts to cultural resources resulting from expanded mining operations and associated reclamation	• Notify BLM and/or KCPD if unknown cultural resources are identified	• Loss of some sites
Paleontological Resources	• No known paleontological resources and therefore, no impact to known paleontological resource • Potential to impact unknown paleontological resources	• None of the impacts to paleontological resources resulting from expanded mining operations and associated reclamation	• Notify BLM and/or KCPD if unknown paleontological resources are identified during operations	• None
Visual Resources	• Visibility of surface disturbance and project facilities, dust plumes from blasting and fugitive light from night operations • Change in the form, line and color of the landscape and the introduction of additional conical lines	• None of the impacts to the visual resources resulting from expanded mining operations and associated reclamation, which includes the incremental enhancement to the visual resources resulting from the reclamation of pre-RMC historic surface disturbance	• Lights used for mining and ore processing shall have reflectors or shields	• Change in visual character of area
Noise	• Incremental increase in existing noise levels from project-related operations • Noise from project-related activities would occur for an additional nine (9) to ten (10) years • Activities which generate the project-related noise would shift to areas further away from residences	• None of the incremental noise impacts resulting from expanded mining operations would occur as a result of the No Action Alternative	• Blasting shall be limited to daylight hours • All heavy equipment, drill rigs and other internal combustion engines shall employ mufflers • If blasting does not comply with the Kern County noise element, then implement noise reduction techniques	• None

RESOURCE	POTENTIAL IMPACTS OF THE PROPOSED ACTION	POTENTIAL IMPACTS OF THE NO ACTION ALTERNATIVE	MITIGATION MEASURES FOR THE PROPOSED ACTION[1]	UNAVOIDABLE EFFECTS OF THE PROPOSED ACTION
Land Use and Wilderness	• Limit public access to project area • Elimination of some pre-existing mining related hazards • Limit recreational use of the project area • OHV casual use would be impacted due to road and route closures • Minor noise, visual and air quality impacts to nearby WSAs	• None of the land use impacts resulting from expanded mining operations and associated reclamation would occur as a result of the No Action Alternative, including the elimination of some pre-existing mining related hazards	• No recommended mitigation measures	• Limits on other use of area • Limits on recreational use of area
Socioeconomics	• Eight (8) new employees • Approximately $200,000 in new annual property taxes and power purchases for nine (9) to ten (10) years and $17,600,000.00 in existing annual payroll, taxes and local expenditures extended for an additional nine (9) to ten (10) years • New secondary employment of 21 individuals for nine (9) to ten (10) years and existing secondary employment of 373 individuals extended for an additional nine (9) to ten (10) years	• Socioeconomic impacts of the No Action Alternative would preclude the generation of approximately eight (8) new jobs, $60,000.00 in additional taxes, $140,000 in additional power purchases, 21 secondary jobs, and the early elimination of all existing economic benefits, including the $17,600,000.00 in existing expenditures and 373 secondary employment positions	• No recommended mitigation measures	• Economically beneficial
Other Resources	• No impacts	• No impacts	• No recommended mitigation measures	• None

1 These mitigation measures are in addition to those proposed by RMC in the Proposed Action, including the Proposed Reclamation Plan.

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RAND PROJECT
DRAFT ENVIRONMENTAL IMPACT STATEMENT/
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CHAPTER 1
INTRODUCTION

1. INTRODUCTION

The Ridgecrest Resource Area of the Bureau of Land Management (BLM) received an amended Plan of Operations (POO) from Rand Mining Company (RMC) in December 1992, and the Kern County Planning Department (Kern County) deemed complete an application for a Conditional Use Permit (CUP) from RMC on March 30, 1993 for the Rand Project, which is a proposal to extend existing operations at RMC's three (3) adjacent, approved, open-pit, heap-leach mine projects (known as the Yellow Aster Mine-Descarga Project, the Lamont Mine Project, and the Baltic Mine Project) by: mining additional gold and silver ore and waste rock at the current average operating rate of approximately 45,000 tons per day; continuing of the existing water use for an additional nine (9) to ten (10) years; constructing facilities to process the additional ore and stockpile the additional waste rock; continuing associated exploration activities; and continuing implementation of wildlife impact reduction measures and reclamation activities. The Rand Project is located approximately 40 miles northeast of the town of Mojave, 25 miles south of the community of Ridgecrest (Figure 1-1) and approximately one (1) mile south of the town of Randsburg in the eastern portion of the County of Kern (Figure 1-2).

1.1. Purpose and Need

The purpose of RMC's Rand Project is to extend the operating life of the existing gold and silver open pit mining and heap leach operations located on both public and private lands south of Randsburg, California. The objective of the Rand Project is to profitably: mine the ore, process the ore to recover precious metals, and reclaim the project area. The project area is approximately 2,520 acres, of which 855 acres are private land and 1,665 acres are unpatented lode and placer mining claims on public lands administered by the BLM (Figure 1-3) (see Chapter 13, Glossary, for definitions of selected terms). A total of approximately 511 acres of surface disturbance would occur if the Proposed Action is approved; 106 acres on private land and 405 acres on public land. The proposed Rand Project includes the expansion of the existing Yellow Aster, Baltic, and Lamont open pits, and the development of new facilities,

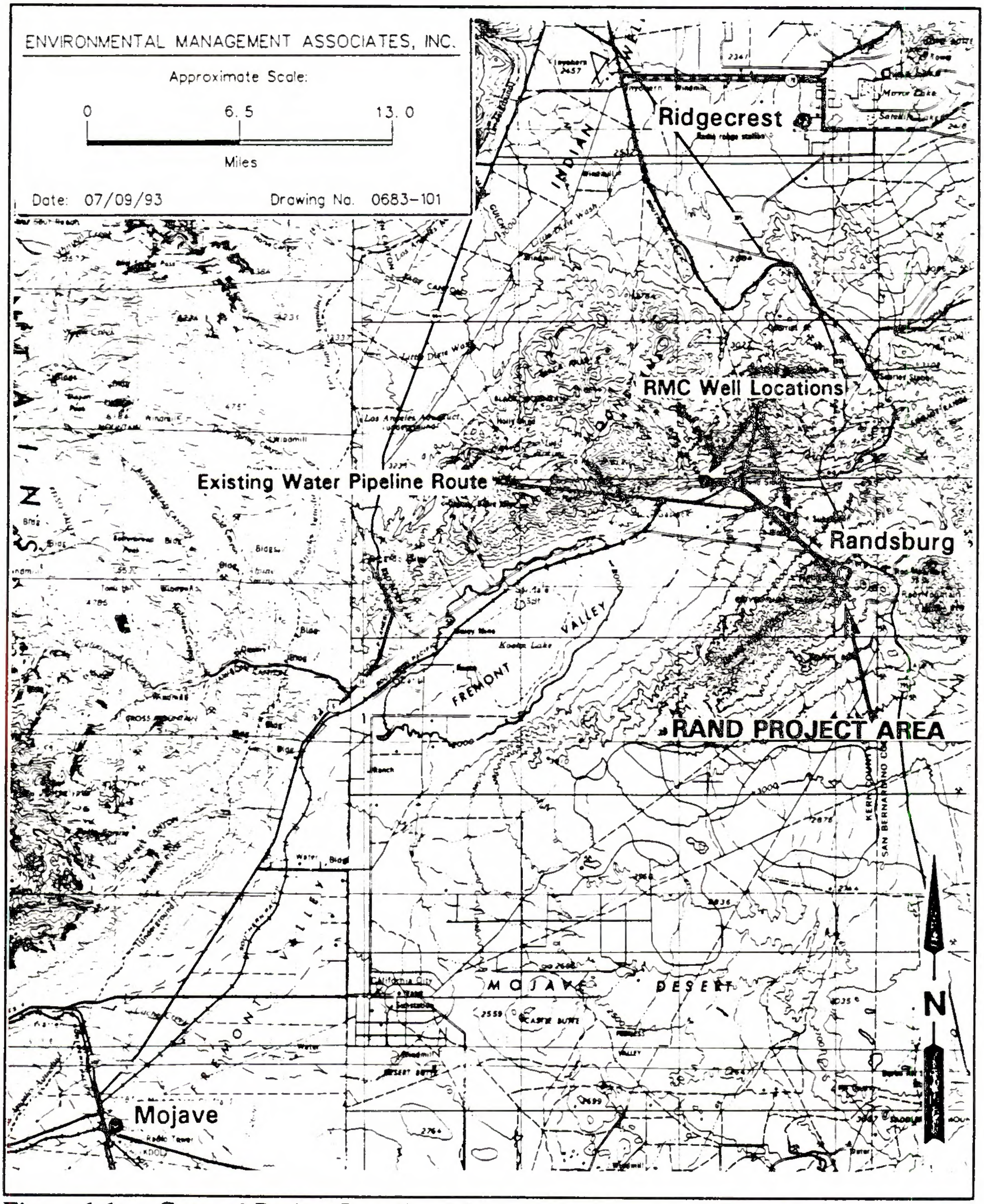
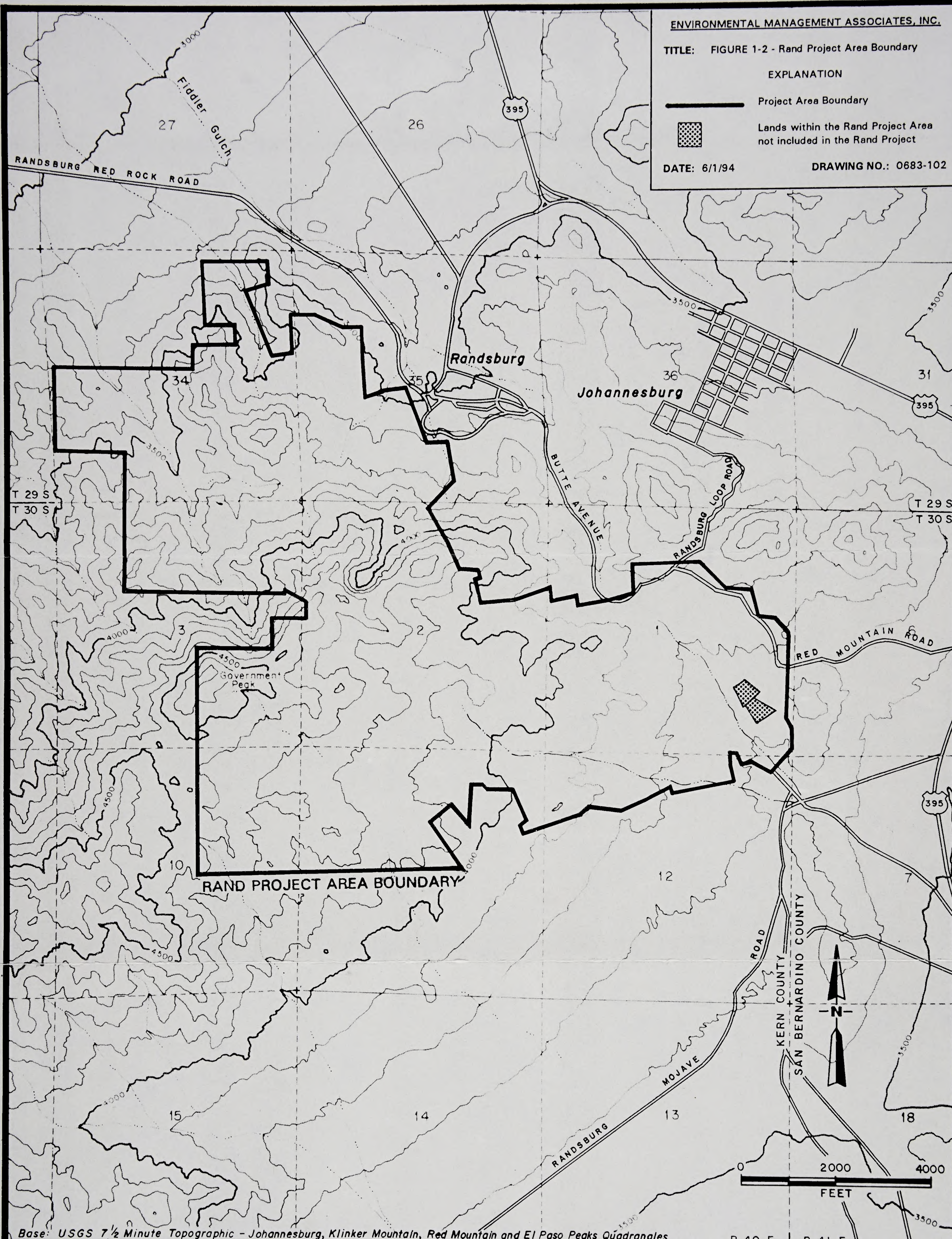


Figure 1-1: General Project Location Map



ENVIRONMENTAL MANAGEMENT ASSOCIATES, INC.

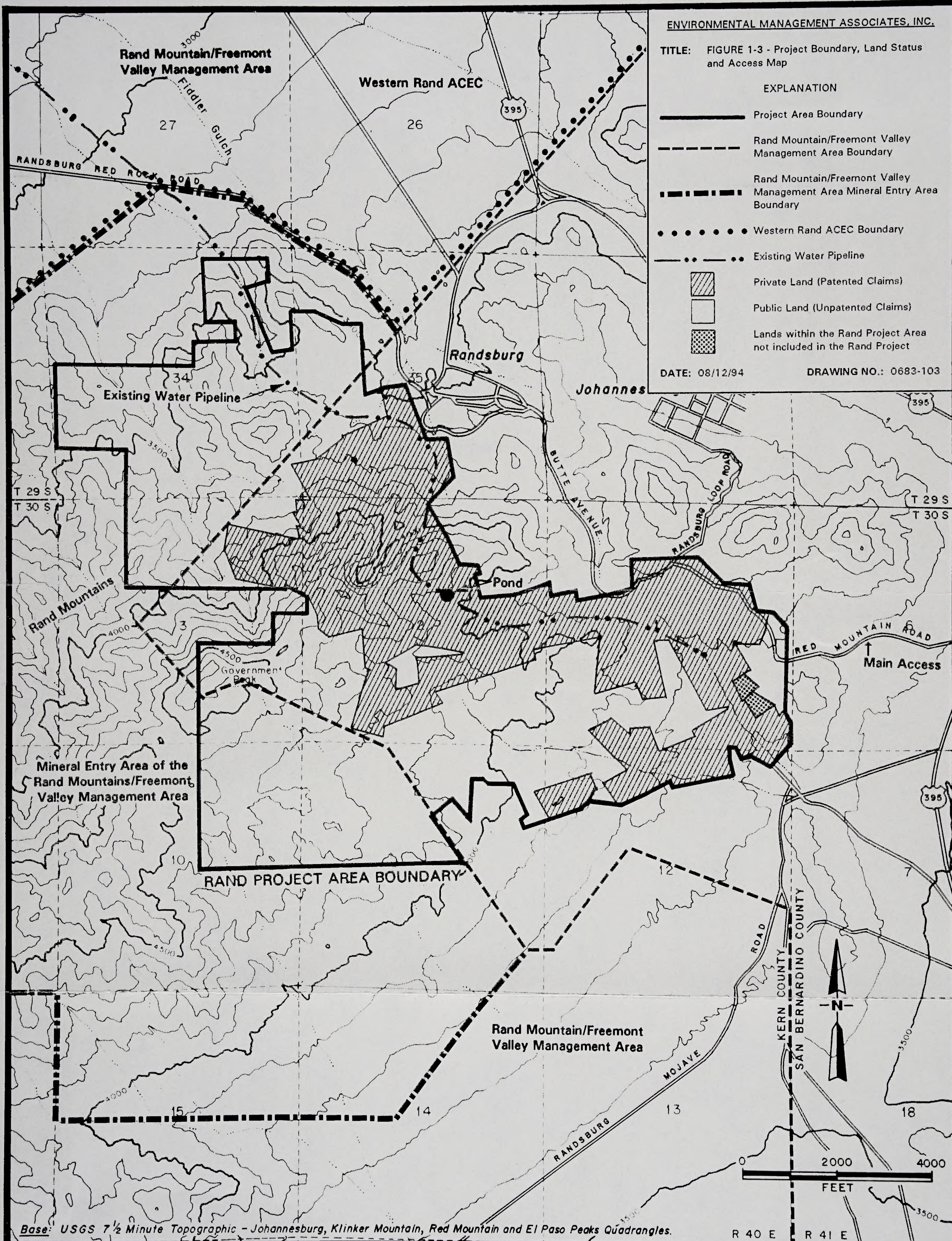
TITLE: FIGURE 1-2 - Rand Project Area Boundary

EXPLANATION

Project Area Boundary

Lands within the Rand Project Area not included in the Rand Project

DATE: 6/1/94 DRAWING NO.: 0683-102



ENVIRONMENTAL MANAGEMENT ASSOCIATES, INC.
TITLE: FIGURE 1-3 - Project Boundary, Land Status and Access Map
EXPLANATION
Project Area Boundary
Rand Mountain/Freemont Valley Management Area Boundary
Rand Mountain/Freemont Valley Management Area Mineral Entry Area Boundary
Western Rand ACEC Boundary
Existing Water Pipeline
Private Land (Patented Claims)
Public Land (Unpatented Claims)
Lands within the Rand Project Area not included in the Rand Project
DATE: 08/12/94
DRAWING NO.: 0683-103
Rand Mountain/Freemont Valley Management Area
Western Rand ACEC
Fiddler Gulch
RANDSBURG RED ROCK ROAD
Randsburg
Johannes
Existing Water Pipeline
BUTTE AVENUE
RANDSBURG LOOP ROAD
Pond
Rand Mountains
Government Peak
RED MOUNTAIN ROAD
Main Access
Mineral Entry Area of the Rand Mountains/Freemont Valley Management Area
RAND PROJECT AREA BOUNDARY
Rand Mountain/Freemont Valley Management Area
MOJAVE ROAD
RANDSBURG
KERN COUNTY
SAN BERNARDINO COUNTY
N
0 2000 4000
FEET
T 29 S
T 30 S
R 40 E
R 41 E
Base: USGS 7 1/2 Minute Topographic - Johannesburg, Klinker Mountain, Red Mountain and El Paso Peaks Quadrangles.

including, a satellite ore deposit, two (2) waste rock stockpiles, two (2) heap leach pads, and other additional processing facilities. The proposed project would mine an additional 60 million tons of ore and 72 million tons of waste rock from the three (3) pit expansions and satellite deposit. The ore would be processed at the existing and proposed heap leach recovery facilities, extending the life of the ongoing operations by an estimated nine (9) to ten (10) years, which would result in the mine operating for approximately 12 years, or until approximately 2006, reclamation activities would then commence until the year 2012. The manpower and general mine operations would be relatively unaffected, increasing the current number of employees by eight (8) individuals.

1.2. Environmental/Regulatory Compliance

1.2.1. Regulatory Requirements

As part of the permit process, RMC has submitted, or will submit, applications for the necessary permits to construct and operate the Rand Project. Table 1-1 lists the various permits/approvals which are required to construct and operate the Rand Project, the agency which issues the permit/approval, and the status of the permit/approval process. Since the BLM has determined that the Rand Project may affect the desert tortoise, a federally threatened species, compliance with the Endangered Species Act of 1973, as amended (ESA), is required. The ESA prohibits the "take" (e.g., killing, harming, or harassment) of a listed species without special exemptions. Section 7(a) of this Act requires that Federal agencies responsible for authorizing projects that may adversely affect a listed species or adversely modify critical habitat designed for such a species formally consult with the U.S. Fish and Wildlife Service. To facilitate compliance with Section 7 of the ESA, RMC has proposed to implement, as a part of the Proposed Action, impact reduction measures similar to those agreed to by RMC, the BLM, the USFWS and the California Department of Fish and Game (CDFG) for RMC's Baltic Mine Project to protect the desert tortoise (USDI, 1992; page 2-43).

Table 1-1: Permits Required for the Rand Project and Their Status

AGENCY		PERMIT NAME	PERMIT STATUS
Bureau of Land Management	Ridgecrest Resource Area	Plan of Operations	Decision Pending Completion of EIS/EIR
		Right-of-Way	Decision Pending Completion of EIS/EIR
Kern County	Planning Department	Conditional Use Permit/ Reclamation Plan	Decision Pending Completion of EIS/EIR
	Department of Health Services	Hazardous Waste Site List Verification	Completed
	Air Pollution Control District	Authority to Construct	Preparation of Application Ongoing
		Permit to Operate	Application to be Submitted After Commencement of Operation
Bureau of Alcohol, Tobacco and Firearms		User of High Explosives	Existing
California Regional Water Quality Control Board	Lahontan Region	Waste Discharge Order	Decision Pending Completion of the EIS/EIR
California Department of Fish and Game		Section 2081 Permit	In Consultation
United States Fish and Wildlife Service		Section 7 Consultation	Completed
State Office of Historic Preservation		Section 106 Process	Completed

Project compliance with the Migratory Bird Treaty Act (16 USC 701-718h) is also required. The Migratory Bird Treaty Act makes no provisions for the killing of migratory birds without a permit, so a zero (0) mortality objective regarding wildlife shall be maintained. Migratory bird mortality through cyanide toxicosis may be prevented at heap leach extraction facilities through the initial design of structures which deny birds access to toxic solutions.

Compliance with National Historic Preservation Act is also required through the completion of the Section 106 process. As part of the Section 106 process the State Office of Historic Preservation (SHPO) has reviewed and concurred with the BLM determination for cultural resources.

1.2.2. Scope of Environmental Review

This EIS/EIR has been prepared under the direction and supervision of both Kern County and the BLM. This EIS/EIR assesses the potential environmental effects of the Rand Project as proposed by RMC, and is both a California Environmental Quality Act (CEQA) document and a National Environmental Policy Act (NEPA) document. It was prepared in accordance with CEQA guidelines for the preparation of an EIR (14 California Code of Regulations (CCR) 15000-15387), Kern County guidelines for the preparation of an EIR, BLM mining regulations (43 Code of Federal Regulations (CFR) 3809), the Council of Environmental Quality's (CEQ's) regulations for implementing NEPA (40 CFR 1500-1508), and BLM guidelines for implementing NEPA (USDI, 1988). This EIS/EIR was prepared by a third-party contractor, Environmental Management Associates, Inc. (EMA), using information gathered from Kern County and BLM files; conversations with Kern County and BLM resource personnel; information gathered from other federal agencies, state agencies, local agencies, and public literature; and information provided by RMC, its consultants and interested individuals.

This EIS/EIR analyzes the environmental impacts of the Proposed Action, which comprises 511 acres of new surface disturbance within the 2,520 acre project area, as well as the Proposed Reclamation Plan for 573 acres of RMC-created surface disturbance within the project area; measures to reduce adverse impacts to air quality, groundwater resources, soils, visual resources and wildlife including the desert tortoise; and the identified potential alternatives to the Proposed Action and the No Action Alternative. This EIS/EIR also analyzes the cumulative impacts of mining and other activities on the environmental resources of the northeastern Rand Mountains area.

1.2.3. Kern County

The Rand Project is required to comply with the Surface Mining and Reclamation Act (SMARA) of 1975 and the State Mining and Geology Board regulations regarding the reclamation of mining operations on lands within the

State of California. These regulations relate to: mining operation and closure; end land use; environmental setting/fish and wildlife habitat; geotechnical requirements; erosion and sediment control; resoiling and revegetation; and administrative requirements. Impacts of the mining operation which need to be addressed will be done by conditions of approval associated with the Lead Agency's (Kern County) approval of the Conditional Use Permit (CUP). These conditions will either appear as mitigation measures identified by this environmental document to avoid potentially significant impacts related to the development of the project or as specific conditions of approval to ensure compliance with SMARA and Chapter 19.100 (Surface Mining Operations) of the Kern County Zoning Ordinance. All required conditions will be identified in a resolution adopted by the hearing body at a regularly scheduled public hearing. The environmental document, resolution, and Staff report prepared for the request, in addition to any material contained therein, will constitute the Lead Agency's response to concerns received from the California Department of Conservation/Division of Mines and Geology (DMG). It is noted that County zoning requirements are not binding on federally owned land, except that the submitted Proposed Reclamation Plan will be subject to further County review and approval.

1.2.4. Bureau of Land Management Policy and Plans

The proposed operations, as outlined in the POO submitted to the BLM by RMC, are required to comply with the standards and procedures in the BLM regulations for surface management of public land being mined under the general mining law (43 CFR 3809). These regulations recognize the statutory right of mineral claim holders to explore for, and develop, federal mineral resources, and encourages such development. The federal regulations require the BLM to review proposed operations to ensure that: 1) adequate provisions are included to prevent unnecessary or undue degradation of public lands; 2) measures are included to provide for reclamation; and 3) the proposed operations comply with other applicable federal, state and local laws and regulations.

The project is located within the California Desert Conservation Area (CDCA), which has been identified by Congress in the Federal Land Policy and Management Act of 1976 (FLPMA) as a unique area in need of special management by the BLM. As such, the BLM developed the CDCA Plan in 1980 to implement appropriate management strategies for the use of the public lands and resources within the CDCA. As part of the CDCA Plan, multiple use classes have been assigned to the public lands within the CDCA. The project area is located within a Class M, moderate use, area. Management of a Class M area is "based upon a controlled balance between higher intensity use and protection of public lands. This class provides for a wide variety of present and future uses such as mining, livestock grazing, recreation, energy, and utility development" (USDI, 1980). Surface mining operations are consistent with the Class M designation for the area. The proposed project area is not located within any proposed protected areas under any of the bills currently under consideration in Congress regarding management of CDCA lands (Walsh, 1993).

The project area is located adjacent to the eastern boundary of, and partially within, the Rand Mountains/Fremont Valley Management Area (RMFVMA). The management plan for the RMFVMA, as described in the RMFVMA Plan, dated April, 1993, is directed towards ensuring that a viable population or populations of the desert tortoise continue in the RMFVMA. The portion of the Rand Mountains to the east of the RMFVMA, which includes the principal portion of the Rand Project area, was not included in the RMFVMA because of the limited amount of public land and low quality of the tortoise habitat (USDI, 1993) (Figure 1-3). The major portion of the Rand Project area located within the RMFVMA mineral entry area is within a 6,080 acre portion of the RMFVMA along the crest of the Rand Mountains which remains land use Class M and continues to allow for mineral entry as well as other use activities.

The existing water supply pipeline that serves the RMC project area from Fremont Valley crosses a portion of the RMFVMA that is designated land use Class L which is located within the expanded Western Rand Area of Critical Environmental Concern (ACEC) (Figure 1-3). A portion of the existing water supply system for the Rand Project area is located within the Western Rand

ACEC, however, no surface disturbing activities associated with the Proposed Action are proposed within the Western Rand ACEC.

The BLM is in the process of developing the West Mojave Coordinated Management Plan (Mojave Plan) (Gum, 1993). The Rand Project area is located within lands to be covered by this plan. The Mojave Plan will be designed to manage critical habitat for the desert tortoise and the Mohave ground squirrel through the designation of seven (7) management areas. The management areas would be subdivided, based on four (4) zones of management activity. The Rand Project area is currently located within an area identified for the continuation of existing types of activities (Gum, 1993).

1.2.5. Public Scoping

A Notice of Intent (NOI) to prepare an EIS was published in the Federal Register on April 6, 1993. A Notice of Preparation (NOP) of an EIR was distributed by Kern County on April 17, 1993. A copy of the NOI, NOP and NOP distribution list are included in this EIS/EIR in Appendix A. As a result of distribution of the NOI and NOP, a total of 15 comments were received which addressed both specific and general issues regarding the Rand Project. These comments have been included in the EIS/EIR in Appendix B. A public scoping meeting was held at the Johannesburg Community Center on April 21, 1993. This scoping meeting was attended by the BLM, RMC, EMA and approximately 30 members of the public. At the public meeting several issues were raised by the public and discussed. A summary of these issues is also attached to this EIS/EIR in Appendix B.

1.3. Intended Uses of the EIS/EIR

Mineral exploration and development on public lands are managed under regulations at 40 CFR 3809, Surface Mining Regulations. The BLM can approve proposed operations provided there is compliance with applicable Federal, State and County laws and regulations. The BLM will use this EIS/EIR, along with other information, in the review of the POO for the Rand Project. The BLM is the Lead Agency for NEPA compliance.

Kern County is responsible for implementation of the California Surface Mining and Reclamation Act of 1975 (SMARA), as amended. Impacts of the mining operation which need to be addressed will be done by conditions of approval associated with the Lead Agency's approval of the Conditional Use Permit. These conditions will either appear as mitigation measures identified by this environmental document to avoid potentially significant impacts related to development of the project or as specific conditions of approval to ensure compliance with SMARA and Chapter 19.100 (Surface Mining Operations) of the Kern County Zoning Ordinance. All required conditions will be identified in a resolution adopted by the hearing body at a regularly scheduled public hearing. It is noted that County zoning requirements are not binding on federally owned land, except that reclamation plans are subject to County review and approval.

As discussed above, there are numerous permits and other approvals required for the Rand Project. A list of the agencies is provided in Table 1-1. These agencies will use this EIS/EIR in their review of those permit applications.

1.4. Project Location

The Rand Project, together with previously approved RMC operations, are located in eastern Kern County, California, approximately 40 miles northeast of Mojave, 25 miles south of Ridgecrest, and 1 mile south of Randsburg (Figure 1-1). The previously approved operations, as well as the proposed project, are located within Sections 34 and 35, Township 29 South, Range 40 East, and Sections 1, 2, 3, 10, 11, and 12, Township 30 South, Range 40 East, Mount Diablo Baseline & Meridian (MDB&M). The Rand Project area is comprised of both public lands administered by the BLM and private lands. The boundary of the Rand Project area and the land status of the Rand Project area are presented in Figure 1-3. RMC's existing groundwater production wells are located north of Koehn Lake in the northeast portion of Fremont Valley in Sections 18 and 21, Township 29 South, Range 40 East, MDB&M and Section 12, Township 29 South, Range 39 East, MDB&M. RMC #4 is located on private land. The pipeline is located in Sections 12 and 13, Township 29 South, Range 39 East and Sections 17, 18, 20, 21, 27 and 28, Township 29 South, Range 40 East, MDB&M (Figure 1-1 and Figure 2-2).

The preferred access to the Rand Project area is from Red Mountain via the Red Mountain Road, a paved county road (Figure 1-3). Alternative access to the project area is from Randsburg via Butte Avenue. The Rand Project area is located on approximately 2,520 acres and topographically lies between 3,300 feet and 4,700 feet above mean sea level (AMSL) on the northeastern slopes of the Rand Mountains.

CHAPTER 2
DESCRIPTION OF THE PROPOSED ACTION

2. DESCRIPTION OF THE PROPOSED ACTION

This chapter has been prepared in response to and in compliance with the regulations found at 40 CFR 1502.10(e) and 40 CFR 1502.14, and the CEQA guidelines (14 CCR 15124 and 15126(d)). The following sections describe the previously approved operations and the Proposed Action.

2.1. Summary of Activities

2.1.1. Existing Operations Summary

RMC's previously approved mining operations in the northeastern Rand Mountains include: the Yellow Aster Mine-Descarga Project area; the Lamont Mine; and the Baltic Mine. RMC has also conducted exploration activities in this same area. Approximately 761 acres of surface disturbance are associated with RMC's previously approved operations within the Rand Project area. This consists of: 390 acres for the Yellow Aster Mine (including the West Valley waste rock stockpile), which includes 96 acres for the Yellow Aster open pit; 200 acres for the Baltic Mine, including 50 acres for the Baltic open pit; 124 acres for the Lamont Mine, including 47 acres for the Lamont open pit; and 47 acres for the Descarga Project. RMC's existing mining operations consist of the removal of ore and waste rock from the three (3) active, permitted, open pits: the Yellow Aster open pit, the Lamont open pit, and the Baltic open pit. Current operations mine an average of approximately 45,000 tons per day (tpd) of ore and waste. The actual amount of mining occurring in any single open pit at a given time can vary from 0 to 60,000 tpd, depending on operating conditions throughout the entire mining operation. The existing and/or previously approved waste rock stockpiles include the North waste rock stockpile, the South waste rock stockpile, the West Valley waste rock stockpile, and the Baltic waste rock stockpile. The South waste rock stockpile has reached design capacity and is currently not in use. The existing Yellow Aster, Lamont, Baltic and Descarga ancillary facilities include: offices; a maintenance shop; water supply facilities; power supply facilities; explosives magazines; chemical storage areas; diesel storage areas; laboratory; roads and right-of-ways; and surface flow and erosion control structures.

2.1.2. Proposed Mine Plan Summary

The proposed Rand Project would consist of the following components: continued development and expansion of the three (3) approved open pits (Yellow Aster, Baltic, and Lamont); new development of an associated satellite deposit; development and/or expansion of two (2) waste rock stockpiles; development of two (2) heap leach facilities; development of two (2) mineral recovery plants; other ancillary facilities; and increased consumption of water from an average of approximately 677 afpy to approximately 800 afpy in 1999 and then decreasing to approximately 437 afpy in 2006. Activities under the Proposed Action would commence in 1995, and would terminate in approximately the year 2006, extending the existing mine life by nine (9) to ten (10) years, reclamation activities would then commence until the year 2012. The proposed project would mine 60 million tons of ore and 72 million tons of waste rock and disturb 511 acres.

2.1.3. Reclamation Plan Summary

The reclamation goals of the Proposed Reclamation Plan are consistent with the land use goals for the area, which are future mining, wildlife habitat, recreation and sheep grazing. The post-mining goals and objectives for reclamation of the Rand Project area are to return the land to a similar land use, to ensure public safety, and to prevent unnecessary or undue degradation of the federal and private lands during operations and until reclamation is successful. The reclamation procedures proposed for the Rand Project incorporate six (6) basic components:

- Establishment of stable topographic surface and drainage conditions that are compatible with the surrounding landscape and serve to control erosion.

- Establishment of soil conditions most conducive to development of a stable plant community through stripping, stockpiling and reapplication of suitable growth material.

- Revegetation of disturbed areas, using plant species adapted to the area, as specified in the revegetation section of the proposed Reclamation Plan, in order to establish a long-term productive biotic community compatible with proposed post-mining land uses. The vegetative cover would be capable of self-regeneration without the long-term dependency on irrigation, soil amendments or fertilizers.

- Consideration of public safety through stabilization, removal, and/or fencing of structures or land forms that could constitute a public hazard.

- Minimization of the outward regrading or reshaping of slopes to reduce further impacts to undisturbed wildlife habitat.

- Consideration of the long-term visual character of the reclaimed area.

To accomplish this, RMC would reclaim the 511 acres of surface disturbance associated with the Rand Project, as well as 64 acres of existing disturbance from the Lamont and Descarga Projects not covered by existing SMARA reclamation plans. In addition, RMC would reclaim 37 acres of historic off-site surface disturbance in the surrounding area, probably in the Rand or El Paso Mountains, at sites to be determined in consultation with the BLM.

Reclamation activities would be bonded by the BLM and Kern County and by the CRWQCB-LR. The CRWQCB-LR bond would be for the neutralization of the heap leach facility and would be in the amount of $2,063,012.50, as estimated by RMC. The reclamation bond, which would be held by the BLM and Kern County, would be in the amount of $432,682.50, as estimated by RMC.

2.2. Previously Approved Operations

RMC's previously approved mining operations in the northeastern Rand Mountains include: the Yellow Aster Mine-Descarga Project area; the Lamont Mine; and the Baltic Mine, all of which are located within the project area boundary shown on Figure 1-3. RMC has also conducted exploration activities in this same area. RMC initiated activities in the Randsburg area in 1984 by acquiring the Yellow Aster Mine and developing a pilot test facility in the Descarga area. The Lamont Mine commenced operations in 1986, followed by the Yellow Aster Mine in 1989 and the Baltic Mine in 1993. RMC's mining and exploration activities are ongoing, and constitute the majority of mining activities currently being conducted in the northeastern Rand Mountains area. Approximately 761 acres of surface disturbance are associated with RMC's previously approved operations within the Rand Project area. This consists of: 390 acres for the Yellow Aster Mine (including the West Valley waste rock stockpile), which includes 96 acres for the Yellow Aster open pit; 200 acres for the Baltic Mine, including 50 acres for the Baltic open pit; 124 acres for the Lamont Mine, including 47 acres for the Lamont open pit; and 47 acres for the Descarga Project. Figure 2-1 shows the locations of specific components of RMC's previously approved mining operations. Modifications to these approved operations would require additional approvals by Kern County and the BLM, as well as possible other approvals.

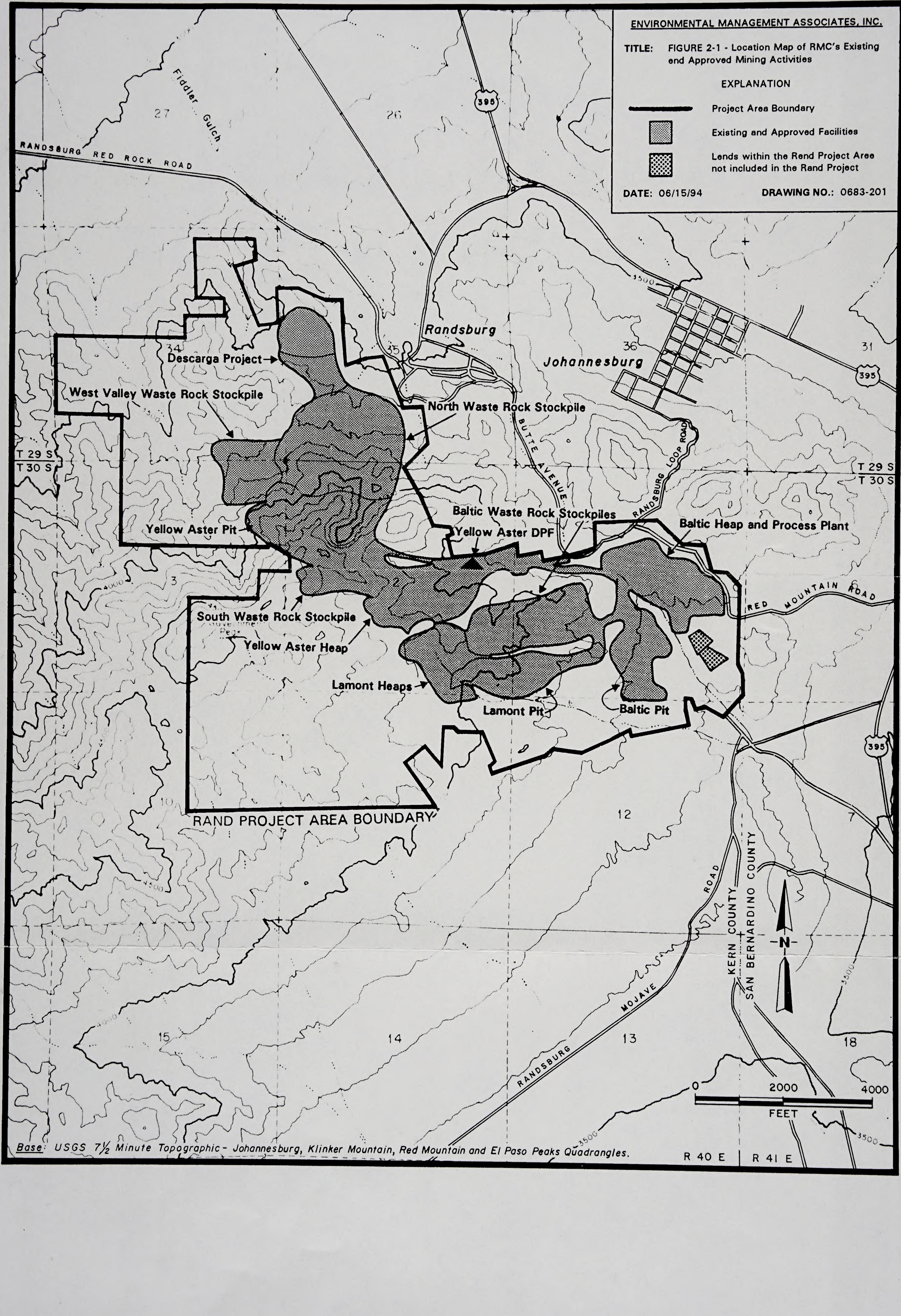
2.2.1. Mining

RMC's existing mining operations consist of the removal of ore and waste rock from the three (3) active, permitted, open pits: the Yellow Aster open pit, the Lamont open pit, and the Baltic open pit. Current operations mine an average of approximately 45,000 tons per day (tpd) of ore and waste. The actual amount of mining occurring in any single open pit at a given time can vary from 0 to 60,000 tpd, depending on operating conditions throughout the entire mining operation. The approximate permitted open pit dimensions are shown in Table 2-1.

Table 2-1: Approximate Surface Dimensions, Maximum Depth from the Surface, and Pit Floor Elevations of the Approved Open Pits

PITS	LENGTH (ft)	WIDTH (ft)	DEPTH (ft)	PIT FLOOR (elev)
Yellow Aster	3,400	1,700	500	3,900
Baltic	2,100	1,300	400	3,400
Lamont	2,200	800	240	3,620

The ore and waste rock blasting operations consist of drilling nominal 6½-inch diameter blastholes spaced on approximately 16-foot to 22-foot centers. The rock



ENVIRONMENTAL MANAGEMENT ASSOCIATES, INC.

TITLE: FIGURE 2-1 - Location Map of RMC's Existing and Approved Mining Activities is blasted with ammonium nitrate-fuel oil (AN/FO) blasting agent at an average powder factor of approximately 0.3 to 0.4 pounds of explosives per ton of rock. Blasting is performed between three (3) and five (5) times per week, usually during the daylight hours. On the morning of the day the blast is scheduled to occur, a notice of the scheduled blast is placed on the public bulletin board next to the post office in Randsburg. Immediately prior to blasting, guards are posted at various lookout points around the project area. When all guards determine the blast area to be secure, the blaster then announces the blast on the mine communication system and the blast is initiated. The blaster then inspects the blast area to determine the blast to be complete and then announces an "all clear" on the mine communication system.

The blasted rock is loaded into 85- to 100-ton capacity trucks. Mined ore is hauled to the heap leach pads. Waste rock is hauled to the waste rock stockpile areas (Figure 2-1). Haulage ramps in the pits are designed with a nominal width of 80 feet and a maximum gradient of ten (10) percent. Minor sections of temporary ramping may be steeper and narrower. Haul roads are up to 100 feet wide, including berms, shoulders and drainage ditches. A list of the equipment necessary to conduct these operations is presented in Table 2-2.

Table 2-2: List of Existing Mobile Equipment

MINING EQUIPMENT		SUPPORT EQUIPMENT	
2	Blasthole drill rigs	15	Pickups
7	85- to 100-ton trucks	2	2-ton flatbed trucks
3	14-yard (29.2-ton) front end loaders	2	Nominal 12,000-gallon water trucks
1	3-cubic yard (6.5-ton) loader	2	Service Trucks
3	Dozers	1	Lube Truck
2	Graders	1	Tire Truck

2.2.1.1. Yellow Aster Pit

The Yellow Aster open pit is located in the NW¼ of Section 2, Township 30 South, Range 40 East, MDB&M, approximately 4,000 feet southwest of the town of Randsburg. The total permitted surface disturbance associated with the Yellow Aster open pit is approximately 96 acres.

2.2.1.2. Lamont Pit

The Lamont open pit is located in the SW¼ of Section 1 and the SE¼ of Section 2, Township 30 South, Range 40 East, MDB&M, approximately 9,000 feet west of the town of Red Mountain. The total permitted surface disturbance associated with the Lamont open pit is approximately 47 acres.

2.2.1.3. Baltic Pit

The Baltic open pit is located in the south-central portion of Section 1, Township 30 South, Range 40 East, MDB&M, approximately 6,000 feet west of the town of Red Mountain. Permitted surface disturbance associated with the Baltic open pit totals approximately 50 acres.

2.2.2. Waste Rock Stockpiles

The existing and/or previously approved waste rock stockpiles include the North waste rock stockpile, the South waste rock stockpile, the West Valley waste rock stockpile, and the Baltic waste rock stockpile (Figure 2-1). The South waste rock stockpile has reached design capacity and is currently not in use.

The North waste rock stockpile, which is located north of the Yellow Aster open pit, is currently being constructed using terraced techniques. As construction of the stockpile progresses, each subsequent terrace will be constructed below and down the stockpile face from the previous terrace, resulting in a final configuration of the stockpile which will extend to the north, covering and stabilizing the Yellow Aster mill tailings deposited during historic operations. A total of 48 million tons of waste could be stockpiled as part of the ongoing permitted operations.

In addition, waste rock has been, in the past, deposited in the South waste rock stockpile, located to the south of the Yellow Aster open pit. A total of four (4) million tons of waste was stockpiled as part of the ongoing permitted operations.

The West Valley waste rock stockpile is being developed to the west of the Yellow Aster open pit. This stockpile is also being constructed using a terrace configuration and will eventually contain nine (9) million tons of material. As mining progresses at the Yellow Aster open pit, this stockpile will become the primary storage site for waste rock from the Yellow Aster open pit.

The Baltic waste rock stockpile is located to the north of the Lamont open pit and to the west of the Baltic open pit. The current construction technique is the bench method, which will be used to complete the final configuration of the stockpile. Approximately 18 million tons of waste rock will be stored at this waste rock stockpile.

2.2.3. Chemical Characteristics of Mined Materials

Waste rock and ore materials which are mined under the existing operations have been tested for its potential to generate acid solutions (acid potential), as well as acid neutralizing solutions (neutralization potential). To establish an adequate set of baseline data of the mining waste proposed to be disposed of as part of the Rand Project, the following tests were conducted on the ore, waste rock and leached ore samples:

(1) Acid-base potential;
(2) pH;
(3) Total threshold limitation concentration (TTLC);
(4) Soluble threshold limitation concentration (STLC) using the California WET method with deionized water.

The acid-base potential test was conducted to determine whether the materials would be acid generating. The other three (3) tests were conducted to determine the chemical characteristics of potential leachate generated under various conditions.

The sampling and analyses procedures used to characterize the waste generated from the Rand Project were based on the procedures used and approved for the Baltic Mine Project in CRWQCB-LR Board Order Number 6-92-103. The results of the Baltic waste characterization study showed that all materials analyzed had acid-base potentials which indicated excess basicity and an extremely low potential for acid formation. Based on these results, it was determined that the STLC-deionized water extraction method presented the most realistic projection of the environmental fate for these materials. Because the previously approved Baltic Project is a component of the Rand Project, it was determined that the analytical methods appropriate for the Rand Project should be identical to those previously used for the Baltic Project. Additionally, the Baltic Project analyses results have been incorporated into the following waste characterization study.

2.2.3.1. Acid-Base Analyses

As part of the acid-base evaluation, total sulfur content of each sample was determined to evaluate the acid generating potential. The neutralization potential of each sample was determined by direct titration. The difference between the two (2) values is expressed in units of tons of calcium carbonate per thousand tons of material analyzed.

Table 2-3 and Table 2-4 present the data from the acid-base analyses of the waste rock, ore and spent ore material. All of the analyzed samples showed excess basicity, which range from >12.5 to 84.82. Based on these analyses, the potential for the waste rock, ore and spent ore material to be acid generating is low to extremely low.

Table 2-3: Acid Forming Potential of the Waste Rock

SAMPLE NUMBER	SAMPLE DATE	SAMPLE LOCATION	pH	TOTAL SULFUR	POTENTIAL ACIDITY	NEUTRAL POTENTIAL	NET NEUTRAL POTENTIAL
Lamont	11-15-91	Lamont		0.14	4.38	89.2	84.82
Baltic	11-15-91	Baltic		0.23	7.19	67.8	60.61
YA-RSW#2	07/16/93	Yellow Aster	8.39	<0.02	<0.6	45.3	>44.7
YA-QMW#4	07/16/93	Yellow Aster	8.68	<0.02	<0.6	15.3	>14.7
YA-QDW#6	07/16/94	Yellow Aster	8.51	<0.02	<0.6	38.6	>38.0
BK93-1A	07/27/94	Yellow Aster	8.29	0.035	1.09	45.3	44.21
BK93-2A	08/03/93	Yellow Aster	8.51	.082	2.56	70.6	68.04
BK93-3A	08/05/93	Yellow Aster	8.55	0.16	5.0	70.6	65.6
BK93-4A	08/07/93	Yellow Aster	8.8	0.21	6.56	78.6	72.04

Table 2-4: Acid Forming Potential of the Ore

SAMPLE NUMBER	SAMPLE DATE	SAMPLE LOCATION	pH	TOTAL SULFUR	POTENTIAL ACIDITY	NEUTRAL POTENTIAL	NET NEUTRAL POTENTIAL
Ore C	11-20-91	Baltic		0.05	1.56	44	42.44
Ore A	11-20-91	Baltic		0.03	0.94	54	53.06
Ore B	11-20-91	Lamont		0.14	4.38	74.5	70.12
Ore D	11-20-91	Baltic		0.04	1.25	73.2	71.95
YA-RSO#1	7-16-93	Yellow Aster	8.13	<.02	<0.6	13.1	>12.5
YA-QMO#3	7-16-93	Yellow Aster	8.37	0.14	4.38	30.8	26.42
YA-QDO#5	7-16-93	Yellow Aster	8.42	<.02	<0.6	37.2	>36.6
BK93-1	7-27-93	Yellow Aster	8.41	0.02	<0.6	85.0	>84.4
BK93-2	8-3-93	Yellow Aster	8.39	0.14	4.38	78.6	74.22
BK93-3	8-5-93	Yellow Aster	8.54	0.29	9.06	69.4	60.34
BK93-4	8-7-93	Yellow Aster	8.45	0.34	10.63	57.8	47.17

The acid-base potential analyses on the Yellow Aster wastes have values that are comparable to those obtained for the Baltic Mine Project. All samples analyzed indicated excess basicity. In addition, analysis of all the Yellow Aster samples indicated pH values in excess of 8.0, indicative of basic materials. Therefore, the use of the STLC-deionized water extraction method is still an appropriate analysis method and presents the most realistic projection of the environmental fate for these waste materials.

2.2.3.2. Chemical Characteristics of Waste Rock

The chemical analyses for the waste rock material are presented in Table 2-5. The TTLC and STLC-deionized water extraction of the waste rock were conducted by pulverizing the samples to the standard STLC 2 millimeter (mm) particle size. STLC values were not exceeded for any constituents tested. The concentrations for arsenic ranged from <0.014 (the detection limit) to 0.116 ppm, well below the STLC threshold of 5.0 ppm.

2.2.3.3. Chemical Characteristics of Ore-Grade Material

The chemical analyses for the ore-grade material are presented in Table 2-6. This includes analysis of oxidized, unoxidized and mixed oxidation state materials. All samples of ore-grade materials, with the exception of sample Ore D, are of fresh material which has not been subjected to leaching by the dilute-cyanide solution to remove the precious metals. Sample Ore D is of leached ore-grade material. The TTLC and STLC-deionized water extraction of the ore-grade material were conducted utilizing the standard STLC 2 mm particle size sample preparation. STLC values were not exceeded for any constituents tested. The concentrations for arsenic ranged from <0.014 (the detection limit) to 1.94 ppm, well below the STLC of 5.0 ppm. There is no significant difference between the STLC values obtained for the leached ore-grade material and the fresh ore-grade material.

2.2.4. Ore Processing

The existing ore processing facilities consist of the Yellow Aster heap leach pad and plant, the two (2) Lamont heap leach pads and plants, the Baltic heap leach pad and plant and the Descarga heap leach pad and plant, as well as the

Table 2-5: Chemical Characteristics of the Waste Rock Material

RAND PROJECT WASTE ROCK SAMPLES[1]																	
Sample	**Ag**	**As**	**Ba**	**Be**	**Cd**	**Co**	**Cr**	**Cu**	**Hg**	**Mo**	**Ni**	**Pb**	**Sb**	**Se**	**Th**	**V**	**Zn**
TTLC ANALYSES																	
YA-RSW#2	<0.4	198	48.4	<0.2	<0.2	5.5	45.5	34.2	<0.06	5.0	25.0	<5.0	3.3	<0.12	0.26	21.6	43.3
YA-QMW#4	0.5	20.4	68.4	<0.2	0.32	4.6	35.6	19.7	<0.06	3.8	13.9	<5.0	<3.0	<0.12	0.42	35.8	50.6
BK93-3A	0.56	144	36.0	<0.2	<0.2	6.6	36.2	19.2	<0.06	3.2	24.6	7.1	<3.0	<0.12	0.22	24.4	52.4
BK93-4A	0.8	66.3	65.6	0.3	0.5	24.2	53.6	53.9	<0.06	5.7	63.7	16.9	3.1	0.13	0.30	56.1	94.6
YA-QDW#6	0.7	204	92.2	<0.2	<0.2	8.1	55.4	80.0	<0.06	3.8	26.9	<5.0	<3.0	<0.12	0.46	42.5	79.9
BK93-1A	0.5	92.9	58.4	<0.2	<0.2	7.8	42.7	15.7	<0.06	3.4	23.0	18.4	4.2	<0.12	0.30	31.8	55.2
BK93-2A	0.5	21.6	50.4	0.2	0.5	6.4	36.2	25.1	<0.06	3.0	20.6	124	<3.0	<0.12	0.30	27.3	81.8
Baltic	0.3	1470	54.9	0.4	0.2	9.3	38.1	36.4	0.06	1.1	34.3	10.9	11.3	0.21	0.18	34.2	59.3
Lamont	0.6	455	57.6	0.4	<0.2	13.8	64.1	45	0.11	2.9	43.7	10.4	18.4	<0.16	0.42	39.4	64.9
STLC (Cal WET) USING DEIONIZED WATER																	
YA-RSW#2	<0.002	0.087	0.080	<0.001	<0.001	<0.005	<0.003	<0.003	<0.0002	0.019	<0.01	<0.025	<0.015	<0.0006	<0.016	<0.002	<0.004
YA-QMW#4	<0.002	<0.014	0.027	<0.001	<0.001	<0.005	<0.003	<0.003	<0.0002	0.005	<0.01	<0.025	<0.015	<0.0006	<0.016	0.0032	0.0047
BK93-3A	<0.002	<0.014	0.083	<0.001	<0.001	<0.005	<0.003	<0.003	<0.0002	0.026	<0.01	<0.025	<0.015	<0.0006	<0.016	<0.002	0.0046
BK93-4A	<0.002	0.035	0.102	<0.001	<0.001	<0.005	<0.003	<0.003	<0.0002	0.026	<0.01	<0.025	0.021	<0.0006	<0.016	<0.002	0.0066
YA-QDW#6	<0.002	0.065	0.065	<0.001	<0.001	<0.005	<0.003	<0.003	<0.0002	0.017	<0.01	<0.025	<0.015	<0.0006	<0.016	<0.002	0.0047
BK93-1A	<0.002	0.053	0.080	<0.001	<0.001	<0.005	<0.003	<0.003	<0.0002	0.016	<0.01	<0.025	<0.015	<0.0006	<0.016	<0.002	0.0047
BK93-2A	<0.002	0.046	0.094	<0.001	<0.001	<0.005	<0.003	<0.003	<0.0002	0.017	<0.01	<0.025	<0.015	<0.0006	<0.016	<0.002	0.0047
Baltic	0.002	0.116	0.062	<0.001	<0.001	<0.002	<0.003	<0.002	<0.0002	0.007	<0.008	<0.018	0.033	0.0008	<0.01	<0.002	0.005
Lamont	<0.001	0.057	0.072	<0.001	<0.001	<0.002	<0.003	<0.002	<0.0002	0.002	<0.008	<0.018	0.064	0.0009	<0.01	0.001	0.007

1 - All samples were pulverized to 2 mm particle size and all units are in parts per million equivalent

Table 2-6: Chemical Characteristics of the Ore-Grade Material

RAND PROJECT ORE SAMPLES[1]																	
Sample	**Ag**	**As**	**Ba**	**Be**	**Cd**	**Co**	**Cr**	**Cu**	**Hg**	**Mo**	**Ni**	**Pb**	**Sb**	**Se**	**Th**	**V**	**Zn**
TTLC ANALYSES																	
YA-RSO#1	0.46	1180	34.0	0.3	<0.20	8.3	16.0	26.6	<0.06	5.5	25.9	19.8	4.9	<0.12	0.26	4.3	89.6
YA-QMO#3	0.9	3470	17.6	0.23	<0.20	5.7	13.3	46.9	<0.06	4.8	13.6	8.9	7.4	0.13	0.18	1.3	75.4
BK93-4	0.7	48.9	132	<0.2	0.60	6.5	49.1	36.4	<0.06	6.4	29.5	<5.0	<3.0	0.15	0.34	26.2	94.5
YA-QDO#5	0.5	1240	28.3	0.2	<0.20	6.0	10.9	44.5	<0.06	3.7	24.2	11.2	7.6	<0.12	0.22	2.8	69.1
BK93-1	0.5	644	37.0	0.2	<0.20	8.2	18.6	25.3	<0.06	3.9	20.9	18.1	<3.0	0.24	0.22	7.8	76.5
BK93-2	0.6	274	18.1	<0.2	<0.20	5.8	19.7	18.3	<0.06	3.2	19.6	68.3	5.8	0.21	0.24	8.8	61.5
BK93-3	0.5	1120	15.6	<0.2	<0.20	7.2	30.4	21.7	<0.06	3.7	26.7	<5.0	3.0	0.13	0.20	18.0	48.5
Ore A	0.2	2330	42.8	0.3	0.2	6.3	17.2	25.7	0.06	1.8	21.9	3.6	65.8	0.16	0.18	7.6	43.4
Ore B	0.4	945	100	0.6	<0.2	9.7	80.8	55	0.06	1.8	44.8	15	12.8	<0.16	<0.18	54	69.1
Ore C	0.5	845	66.9	0.3	0.4	10.3	56	36.2	0.09	2.2	46.7	7.9	14	0.16	0.24	37.5	55
Ore D	0.7	973	59.7	0.5	<0.2	11.5	55.8	33.4	<0.06	<0.4	44.3	9.9	42.7	<0.16	0.36	40.2	60.4
STLC (Cal WET) USING DEIONIZED WATER																	
YA-RSO#1	<0.002	0.153	0.052	<0.001	<0.001	<0.005	<0.003	<0.003	<0.0002	0.026	<0.01	<0.025	<0.015	<0.0006	<0.016	<0.002	0.0091
YA-QMO#3	<0.002	0.388	0.082	<0.001	<0.001	<0.005	<0.003	<0.003	<0.0002	0.026	<0.01	<0.025	<0.015	<0.0006	<0.016	<0.002	0.0059
BK93-4	<0.002	<0.014	0.082	<0.001	<0.001	<0.005	<0.003	<0.003	<0.0002	0.061	<0.01	<0.025	<0.015	0.0008	<0.016	<0.002	0.0046
YA-QDO#5	<0.002	0.145	0.080	<0.001	<0.001	<0.005	<0.003	<0.003	<0.0002	0.03	<0.01	<0.025	<0.015	<0.0006	<0.016	<0.002	0.0042
BK93-1	<0.002	0.044	0.094	<0.001	<0.001	<0.005	<0.003	<0.003	<0.0002	0.031	<0.01	<0.025	<0.015	0.0011	<0.016	<0.002	<0.004
BK93-2	<0.002	0.019	0.086	<0.001	<0.001	<0.005	<0.003	<0.003	<0.0002	0.033	<0.01	<0.025	<0.015	<0.0006	<0.016	<0.002	0.0056
BK93-3	<0.002	0.059	0.078	<0.001	<0.001	<0.005	<0.003	<0.003	<0.0002	0.029	<0.01	<0.025	<0.015	<0.0006	<0.016	<0.002	<0.004
Ore A	0.002	1.44	0.048	0.001	0.001	0.002	0.003	0.002	0.0002	0.004	0.008	0.018	0.179	0.0011	0.01	0.001	0.003
Ore B	0.005	1.08	0.139	<0.001	<0.001	0.005	0.004	0.004	<0.0002	<0.002	0.036	<0.018	0.032	<0.0008	<0.01	0.014	0.014
Ore C	0.002	0.861	0.062	0.001	0.001	0.004	0.003	0.002	0.0002	0.004	0.008	0.018	0.053	0.0008	0.01	0.003	0.002
Ore D	0.003	1.94	0.086	<0.001	<0.001	0.006	<0.003	0.039	<0.0002	<0.002	0.026	0.024	0.044	0.0009	<0.01	0.01	0.019

1 - All samples were pulverized to 2 mm particle size and all units are in parts per million equivalent

Yellow Aster doré processing facility (DPF) (Figure 2-1). The two (2) Lamont heap leach pads have reached their design capacity, have been decommissioned and are in a closure phase. The Descarga pad is currently used for testing.

The Yellow Aster heap leach facility includes a pregnant solution (solution containing precious metals) pond, a barren solution (solution without precious metals) pond and an approximate 15 million-ton heap leach pad. Run-of-mine ore from the Yellow Aster open pit is placed on the Yellow Aster heap leach pad, located southeast of the open pit. The run-of-mine ore is stacked in 25-foot lifts to a final height that ranges up to 350 feet above local grade.

Ore mined from the Lamont pit from 1986 through 1990 was placed on one (1) of two (2) Lamont heap leach pads located immediately west of the Lamont open pit. As a part of the decommissioning of the heaps, rinsing of the ore on these two (2) pads has been completed and a release request filed with the California Regional Water Quality Control Board, Lahontan Region (CRWQCB-LR). The CRWQCB-LR has made the determination that the spent ore is neutralized and can be managed as a Class C mining waste.

The Baltic heap leach facility, which is located to the north of the Baltic open pit, includes a leach pad and a combined pregnant solution and barren solution pond. The leach pad will eventually hold approximately 15 million tons of ore. The run-of-mine ore is stacked in 25-foot lifts to a final height of approximately 200 feet above local grade.

The Descarga operations, located north of the Yellow Aster open pit in the NW¼ of Sections 35, Township 29 South, Range 40 East, MDB&M, is a heap leach operation designed to test leach ore from the Randsburg area and reprocess the mine waste from historic Yellow Aster mining operations. The Descarga heap leach pad is permitted for a 1.5 million-ton heap leach pad. The leach pad currently contains approximately 331,000 tons of material. The heap leach facility includes a pregnant solution pond and barren solution pond. The run-of-mine and screened ore is stacked in 25-foot lifts and will reach a final height of 50 feet above local grade.

The general stacking procedure for the construction of each of the heaps consists of having the loaded trucks dump the ore on the pad. A small front-end loader spreads a measured amount of calcium oxide over the pile of dumped ore. The calcium oxide is applied to the heap for leach solution pH control. A bulldozer-type tractor then pushes the ore to the active portion of the pad, maintaining an approximate 25-foot high lift. Solution distribution lines are then placed on the ore. This process is repeated until the entire pad is covered and then subsequent benches are constructed.

Application of the cyanide solution is accomplished using a drip irrigation system, occasionally supplemented with sprinklers on the side slopes and occasionally on top of the heap. Sprinklers are used on the slopes of the heap for worker safety reasons, and because they are more effective at covering the slopes with solution. In addition, the sprinklers allow for flexibility in the rate at which solution is applied to the heap, which is necessary during periods of solution volume fluctuation. Solution is applied at a rate of between 0.003 and 0.005 gallons per minute (gpm) per square-foot of surface area. Leaching is concurrent with loading.

The barren solution percolates through the heaped ore to the leachate collection system and flows by gravity to lined collection ditches with perforated pipe and drain rock cover, acting as a french drain. The ditches direct the flows to the pregnant solution pond. The pregnant solution is then pumped to the process plant and through a series of carbon columns, where the precious metals are adsorbed onto carbon. All components of each process plant, including the concrete slab and portions of some of chemical storage areas, are constructed on a synthetic liner within containment berms. These liners are extensions of the pregnant solution pond liners, so that any spilled materials drain into the solution ponds. The ponds are also covered with bird exclusion netting, attached to cables and tie-downs off the edge of the liner. The solution ditches are not covered.

Upon exiting the carbon columns, the leach solution, now barren of precious metals, flows to the barren pond, where fresh water is added to maintain the water balance. Barren leach solution is then recycled back onto the top of the heap to continue the process cycle. Sodium cyanide is added to the barren leach solution to reestablish the desired reagent level of up to 250 parts per million (ppm) cyanide.

The carbon in the carbon columns, when loaded to capacity with precious metals, is transferred to the stripping section. Hot alkaline (pH 13) solution is used to strip the precious metals from the loaded carbon. The solution, now containing the precious metals, is then pumped through an electrowinnowing circuit where the metals are electroplated. The stripped carbon is cleaned with a dilute hydrochloric or nitric acid solution before being brought back on-line.

The resultant gold-bearing material from each processing plant is then transported to the DPF at the Yellow Aster plant for further processing. The gold-bearing "steel wool" is melted to separate out the non-precious metal, leaving a precious metal doré bar. The Yellow Aster DPF is equipped with a baghouse as part of the particulate emission control system.

2.2.5. Ancillary Facilities

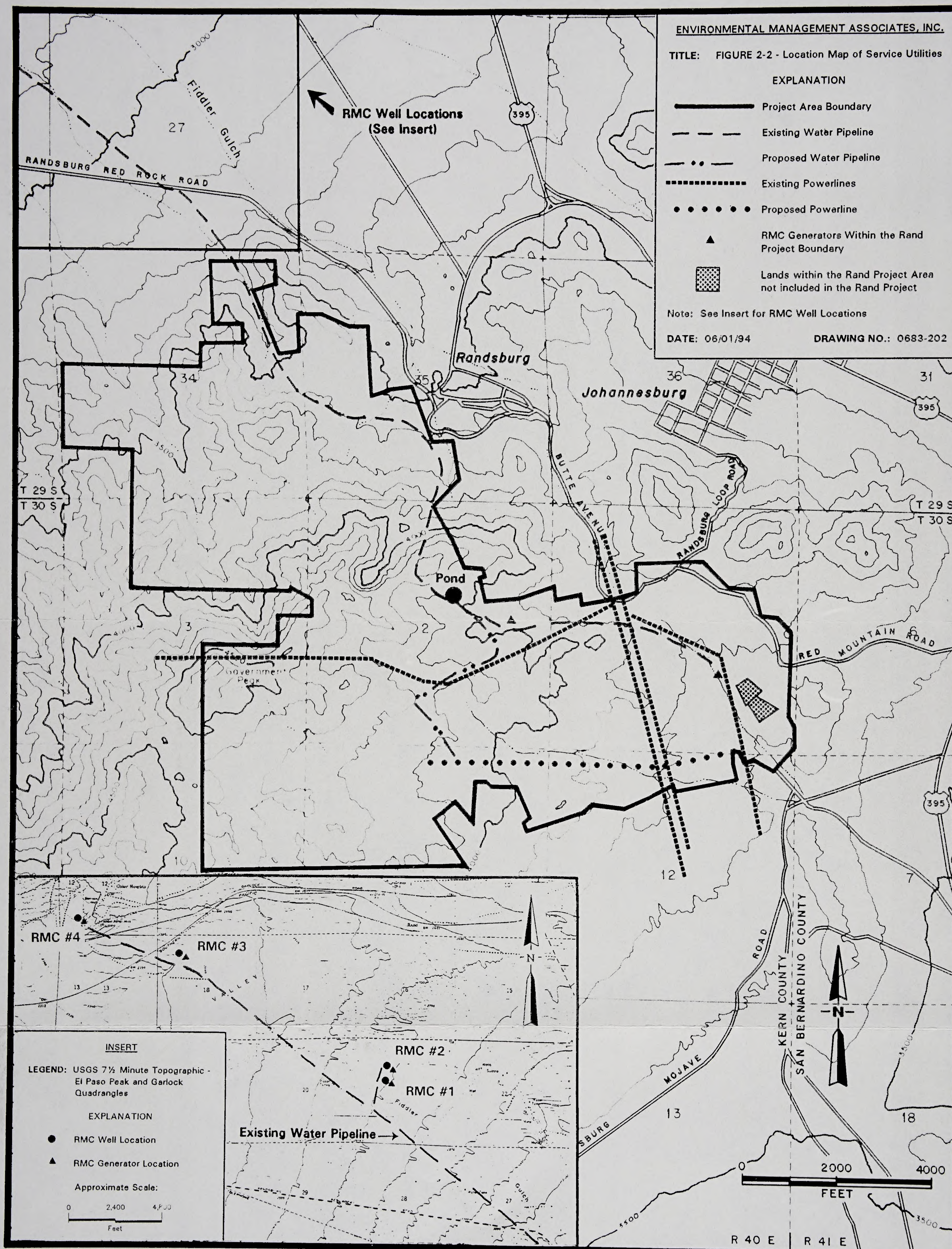
The existing Yellow Aster, Lamont, Baltic and Descarga ancillary facilities include: offices; a maintenance shop; water supply facilities; power supply facilities; explosives magazines; chemical storage areas; diesel storage areas; laboratory; roads and right-of-ways; and, surface flow and erosion control structures.

2.2.5.1. Manpower

Approximately 140 employees currently operate the existing mining facilities. Of these, approximately 30 employees are salaried administrative, supervisory, and technical staff. The remaining employees operate the mining and processing facilities on rotating shifts. Mining and processing operations are conducted 24 hours per day, seven (7) days per week, 365 days a year. Most of the salaried staff work one (1) shift per day, five (5) days per week. Thirty-two (32) employees (approximately 25 percent) live locally, in the towns of Randsburg, Johannesburg and Red Mountain. Eighty-seven (87) employees (approximately 60 percent) reside in Ridgecrest and commute to the mine site each day. The other 21 employees (approximately 15 percent) reside in other communities in the regional area and commute to the mine site each day. Because carpooling is prevalent in this area, there are approximately 40 trips per day between Ridgecrest and the other communities in the region and the project site. The traffic is spread over a 24-hour period.

2.2.5.2. Water Supply

RMC uses four (4) water wells to produce water sufficient to operate existing mining activities (Figure 1-1 and Figure 2-2), which includes the operation of the heap leach facilities and dust control. RMC is planning on the drilling and completion of an additional groundwater production well in the vicinity of well #4 on private land. This well (#5) will be completed similar to well #4 and be used primarily as a backup to well #4. RMC currently consumes up to approximately 677 acre-feet per year (afpy), or approximately 605,000 gpd, to compensate for evaporative loss and capillary retention of water in the heaps (approximately 77-percent), and water used for dust suppression, construction and reclamation at their Yellow Aster, Lamont, Baltic and Descarga facilities (approximately 23-percent). RMC's standard procedure to produce the required water is to pump an average of 460 gpm from well #4, with the actual pumping rate varying from 0 to 580 gpm during any given day of the year. This is periodically supplemented by wells #1 and #2 at approximately ten (10) gpm each and well #3 at 100 gpm. All water used in the processing of the ores which does not evaporate is recycled. Potable water is supplied by the potable water line from the Rand Communities Water District (RCWD). The cross connection between the process and potable water systems are fitted with one-way flow valves to eliminate the possibility of process water entering the potable water system.


ENVIRONMENTAL MANAGEMENT ASSOCIATES, INC.
TITLE: FIGURE 2-2 - Location Map of Service Utilities
EXPLANATION
Project Area Boundary
Existing Water Pipeline
Proposed Water Pipeline
Existing Powerlines
Proposed Powerline
RMC Generators Within the Rand Project Boundary
Lands within the Rand Project Area not included in the Rand Project
Note: See Insert for RMC Well Locations
DATE: 06/01/94
DRAWING NO.: 0683-202
RMC Well Locations (See Insert)
Fiddler Gulch
RANDSBURG RED ROCK ROAD
Randsburg
Johannesburg
BUTTE AVENUE
RANDSBURG LOOP ROAD
RED MOUNTAIN ROAD
MOJAVE ROAD
Pond
Government Peak
KERN COUNTY
SAN BERNARDINO COUNTY
T 29 S
T 30 S
R 40 E
R 41 E
395
0
2000
4000
FEET
N
INSERT
LEGEND: USGS 7½ Minute Topographic - El Paso Peak and Garlock Quadrangles
EXPLANATION
RMC Well Location
RMC Generator Location
Approximate Scale:
0
2,400
Feet
RMC #1
RMC #2
RMC #3
RMC #4
Existing Water Pipeline

2.2.5.3. Power Supply and Utilities

Power for the current operations is primarily supplied by Southern California Edison (SCE) through their power grid. However, each of RMC's existing water production wells require diesel-powered equipment for normal operations. The generators at wells #1 and #2 are each operated approximately one (1) hour per week year-round. The generator at well #3 operates approximately eight (8) hours per week year-round, and the pumps at well #4 are driven an average of 20 hours per day, year-round.

Emergency power requirements for the project are provided by two (2) 350 kW diesel-powered electric generators located in the Baltic and Yellow Aster process facilities (Figure 2-2). During periods of service interruption from SCE, essential loads and services are powered by these generators. Telephone service is provided to the offices and maintenance shop; field communications are by an FM mine communication system.

2.2.5.4. Chemical Storage

A list of the chemicals currently used at RMC's operations area, the annual consumption, quantities stored on-site and the type of secondary containment is provided in Table 2-7. All chemicals, except as noted below, are stored in closed, weather-proof containers in secured, open-air storage areas.

Sodium cyanide is shipped, received and stored in manufacturer's-approved 3,000-pound net capacity flow bins. Sodium cyanide is added to the barren solution at the barren solution ponds in order to maintain the desired 200 to 250 ppm cyanide concentration in the barren solution. The primary method used in this process is to allow a controlled amount of solid sodium cyanide briquets to flow directly from the flow bin into a nominal 50-pound capacity baffled mixing chamber. Into this chamber a metered flow of barren solution (minimum 10.0 pH) is directed, resulting in the dissolution of the sodium cyanide. The resulting sodium cyanide solution, at about 30 percent strength, flows from the chamber through a piping system into the barren solution pond.

Table 2-7: Chemicals Used for Existing Operations, Annual Consumption, Location and Amount of On-site Storage and Secondary Containment

CHEMICALS USED FOR EXISTING OPERATIONS				
CHEMICAL NAME	**ANNUAL CONSUMPTION**	**AMOUNT STORED ON-SITE**	**LOCATIONS STORED**	**SECONDARY CONTAINMENT**
Sodium Cyanide	1,700,000 lbs	168,000 lbs	• West of Yellow Aster Barren Pond • West of Baltic Barren Pond	• None • Liner
Sodium Hydroxide	120,000 lbs	25,000 lbs	• West of Yellow Aster Barren Pond • West of Baltic Pregnant Pond • Lamont Storage Area	• Concrete pad • Liner • None
Hydrochloric Acid	95,000 lbs	12,000 lbs	• South of Yellow Aster Mill Building • Lamont Storage Area	• Bermed concrete pad over HDPE liner • None
Polymaleic Acid	219,000 lbs	70,000 lbs	• SW of Yellow Aster Pregnant Pond • West of Yellow Aster Barren Pond • SE of Baltic Ponds	• Concrete pad • None • Liner
Nitric Acid	119,720 lbs	19,000 lbs	• Baltic Process Facility • Lamont Storage Area	• Bermed concrete pad over HDPE liner • None
Diesel Fuel	1,470,000 gal	20,000 gal	• East of Yellow Aster Barren Pond • Lamont Process Area • South of Baltic Process Area	• Bermed HDPE liner • None • Bermed HDPE liner
Unleaded Gasoline	40,000 gal	250 gal	• East of Yellow Aster Barren Pond	• Bermed HDPE liner
Ammonium Nitrate	5,400,000 lbs	184,000 lbs	• NW of Yellow Aster Leach Pad	• None
Acetylene	12,000 ft^3	2,000 ft^3	• Miscellaneous locations throughout project area	• None
Oxygen	12,000 ft^3	5,000 ft^3	• Miscellaneous locations throughout project area	• None
Automatic Transmission Fluid	800 gal	110 gal	• Maintenance area south of Yellow Aster Process Facility	• Concrete pad
Ethylene Glycol	1,000 gal	110 gal	• Maintenance area south of Yellow Aster Process Facility	• Concrete pad
Solvents	550 gal	110 gal	• Maintenance area south of Yellow Aster Process Facility	• Concrete pad
Rock Oil	550 gal	55 gal	• Maintenance area south of Yellow Aster Process Facility	• Concrete pad
Gear Oil	550 gal	55 gal	• Maintenance area south of Yellow Aster Process Facility	• Concrete pad
Greases	400 gal	50 gal	• Maintenance area south of Yellow Aster Process Facility	• Concrete pad

CHEMICALS USED FOR EXISTING OPERATIONS				
CHEMICAL NAME	ANNUAL CONSUMPTION	AMOUNT STORED ON-SITE	LOCATIONS STORED	SECONDARY CONTAINMENT
Calcium Oxide	23,000,000 lbs	300,000 lbs	• Each heap leach pad.	• Lined and bermed
Activated Carbon	152,000 lbs	80,000 lbs	• Lamont storage area • Baltic Process Facility • Yellow Aster Process Facility	• None • HDPE liner • None
Propane	4,000 gal	220 gal	• Miscellaneous locations throughout project area	• None
Calcium Hypochlorite	4,000 lbs	8,000 lbs	• Lamont Storage Area	• None
Motor Oil	10,000 gal	500 gal	• Maintenance area south of Yellow Aster Process Facility	• Concrete pad
C-354	1,300 gal	275 gal	• Yellow Aster plant • East of Baltic Ponds	• Concrete pad and HDPE liner • None
Silicon Dioxide	2,400 lbs	200 lbs	• Yellow Aster laboratory	• Concrete slab
Sodium Nitrate	1,200 lbs	200 lbs	• Yellow Aster process plant	• Concrete and HDPE liner
Borax (5 mol)	1,200 lbs	200 lbs	• Yellow Aster plant	• Concrete and HDPE liner
Tovan Blasting Emulsion	125 tons	10 tons	• Northwest Yellow Aster heap leach	• None
Cast Boosters	42,000	1,000	• Northwest Yellow Aster heap leach	• None
Detonation Cord	36,000 rolls	1,500 rolls	• Northwest Yellow Aster heap leach	• None

When liquid cyanide is received, it is off-loaded from the manufacturer's specially-designed trucks into one (1) of two (2) 10,000 to 15,000 gallon storage tanks at a concentration of about 30 percent cyanide and a pH of about 13.0. This solution is then metered directly into the barren solution pond.

When bulk truck solid sodium cyanide is received, it is put into solution directly from the truck and stored at a concentration of about 30 percent cyanide and a pH of about 13.0 in one (1) of two (2) adequately sized storage tanks. This solution is then metered directly into the barren solution pond.

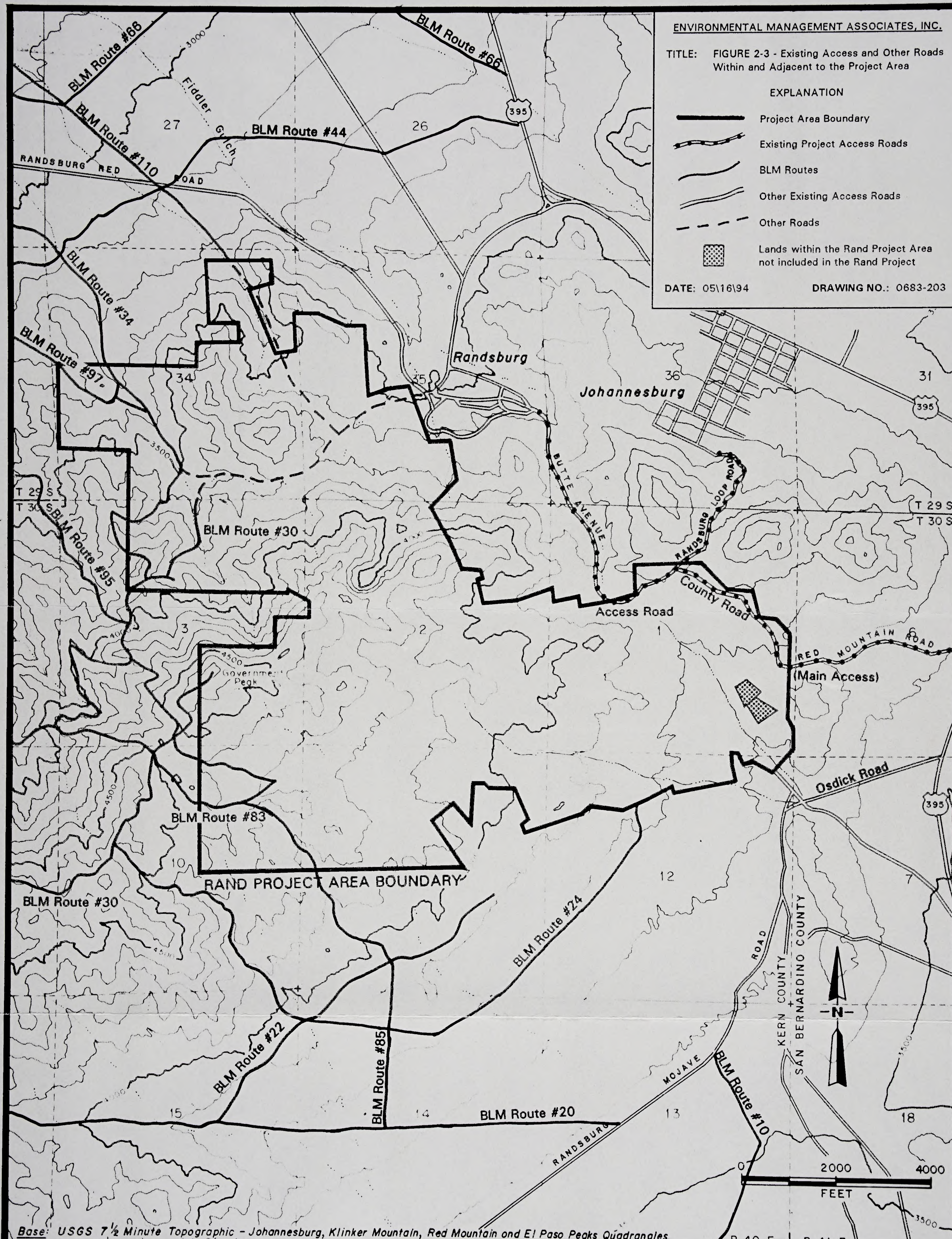
The sodium hydroxide, hydrochloric acid, polymaleic acid and carbon are stored at the processing facilities (Table 2-7). The blasting agents and associated explosives, which are necessary for mining operations, are stored at existing permitted magazines. The calcium oxide is stored adjacent to the Yellow Aster heap. All chemicals are stored in conformance with local, state and federal regulations and company safety policies.

2.2.5.5. Waste Disposal

RMC has four (4) septic treatment systems, each with a leach drain field permitted through Kern County, within the Rand Project area. RMC contracts with local disposal service companies for the pumping of the septic tanks and the removal of other (non-mining) waste from the project site, such as the removal of solid office waste, for disposal in an approved landfill. Regulated wastes, such as used oils and oil filters, are currently transported off-site by Petroleum Recycling Company to their Fontana, California facility. The waste oil is treated and then transported to their Signal Hills facility for sale as bunker fuel in the Los Angeles harbor area. The oil filters are processed and recycled. Other regulated wastes, such as laboratory wastes and spent solvents, are transported off-site by an authorized hauler and recycled, or disposed of according to all applicable local, state and federal laws and regulations and in a manner approved by the responsible regulatory agencies.

2.2.5.6. Roads

The preferred access to the existing operations is via the Red Mountain Road, a paved county road, from Red Mountain (Figure 2-3). Access to existing operations is also possible from Randsburg, to the north, and Johannesburg, to the north, via Butte Avenue and the Randsburg Loop Road, respectively. Both these roads connect with the relocated county road, which was constructed to provide a public road around the existing Baltic Mine Project. The relocated county road connects the Red Mountain Road with Butte Avenue near the access road for the existing operations. Specific components of the existing operations are accessed from the Red Mountain Road via unpaved roads. Temporary and permanent access and haul roads exist throughout the area of existing operations.



ENVIRONMENTAL MANAGEMENT ASSOCIATES, INC.

TITLE: FIGURE 2-3 - Existing Access and Other Roads Within and Adjacent to the Project Area

DATE: 05\16\94 DRAWING NO.: 0683-203

Base: USGS 7½ Minute Topographic - Johannesburg, Klinker Mountain, Red Mountain and El Paso Peaks Quadrangles.

As part of RMC's operations, water sprays and/or chemical treatments are used to minimize the generation of dust from disturbed surfaces. Water, and/or an environmentally acceptable chemical dust inhibitor, is applied to the haulage roads, ore loading, and dozing operations in sufficient quantities to prevent significant emissions. Water is generally used in areas of active disturbance, while the chemical dust inhibitor, usually sodium lignosulfonate, is used in areas that are constructed for operations that continue for the life of the project, such as the permanent haul road. Sodium lignosulfonate is a non-toxic, non-hazardous co-product of cellulose production from trees.

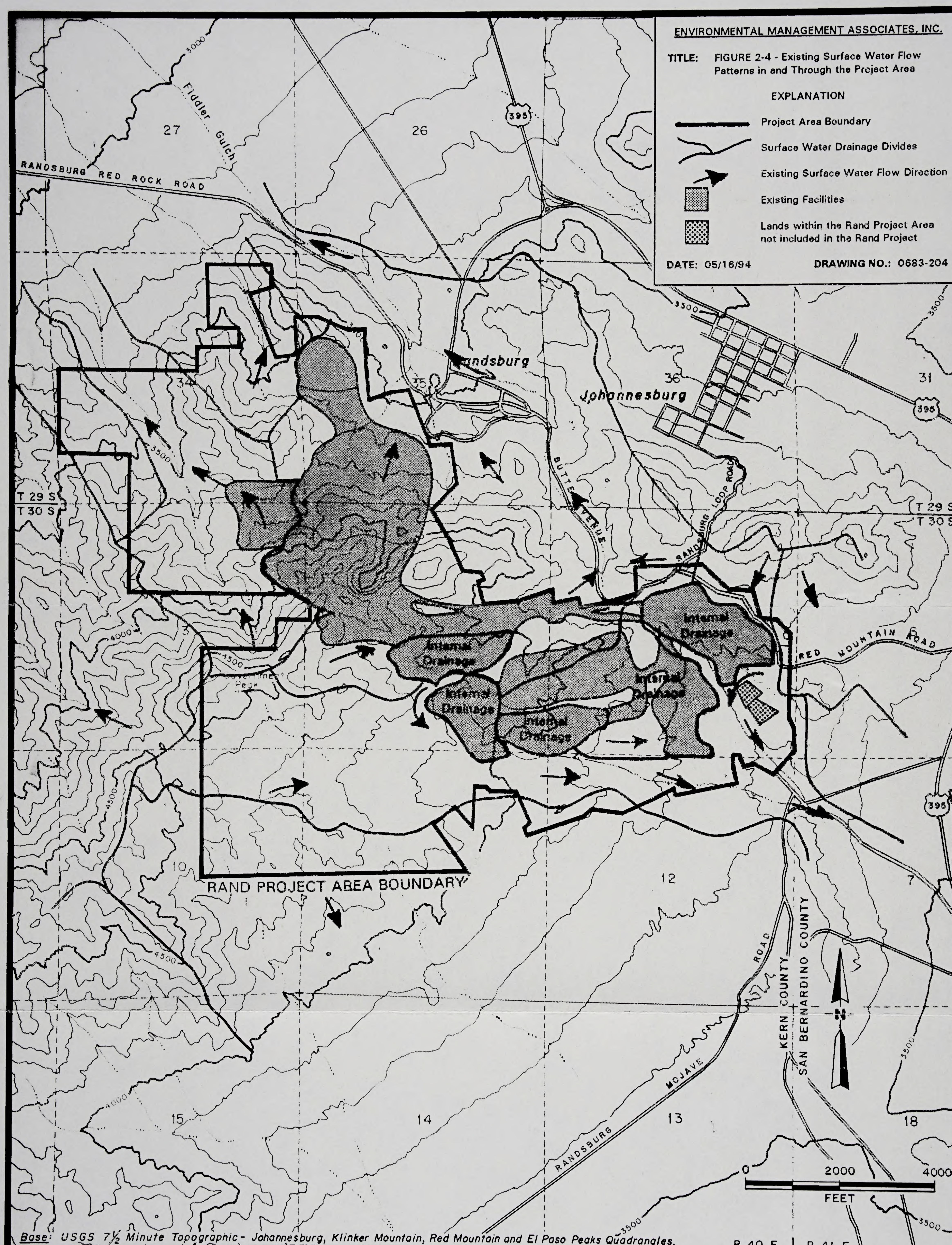
2.2.5.7. Ditches and Surface Flows

Existing surface flow patterns in and through the project area are shown on Figure 2-4. As part of the existing operations, some surface drainages have been diverted around project facilities. In general, surface flows from isolated precipitation events that are diverted around the project facilities are routed back into their natural drainages. Surface flows into the pits collect at the bottom of the pits and are allowed to evaporate. Due to historic mining operations at Yellow Aster the existing open pit is not currently internally drained and surface flows into the open pit and precipitation in the open pit flow to the north out of the open pit into natural drainages.

2.3. Proposed Action

2.3.1. Introduction

The Rand Project is a proposal to extend existing operations at the three (3) adjacent, approved, open-pit, heap-leach mine projects by: mining additional gold and silver ore and waste rock at the current average operating rate of approximately 45,000 tons per day; continuing of the existing water use for an additional nine (9) to ten (10) years; constructing facilities to process the additional ore and stockpile the additional waste rock; continuing associated exploration activities; and continuing implementation of wildlife impact reduction


ENVIRONMENTAL MANAGEMENT ASSOCIATES, INC.
TITLE: FIGURE 2-4 - Existing Surface Water Flow Patterns in and Through the Project Area
EXPLANATION
Project Area Boundary
Surface Water Drainage Divides
Existing Surface Water Flow Direction
Existing Facilities
Lands within the Rand Project Area not included in the Rand Project
DATE: 05/16/94
DRAWING NO.: 0683-204
Fiddler Gulch
RANDSBURG RED ROCK ROAD
Randsburg
Johannesburg
BUTTE AVENUE
RANDSBURG LOOP ROAD
RED MOUNTAIN ROAD
Internal Drainage
RAND PROJECT AREA BOUNDARY
MOJAVE
RANDSBURG
ROAD
KERN COUNTY
SAN BERNARDINO COUNTY
395
T 29 S
T 30 S
27
26
34
35
36
31
3
10
12
7
15
14
13
18
6
3000
3500
4000
4500
N
0
2000
4000
FEET
R 40 E
R 41 E
Base: USGS 7½ Minute Topographic - Johannesburg, Klinker Mountain, Red Mountain and El Paso Peaks Quadrangles.

measures and reclamation activities. The proposed project has been designed to meet the anticipated permit requirements of the various federal, state and local agencies.

The proposed Rand Project would consist of the following components: continued development and expansion of the three (3) approved open pits (Yellow Aster, Baltic, and Lamont); new development of an associated satellite deposit; development and/or expansion of two (2) waste rock stockpiles; development of two (2) heap leach facilities; development of two (2) mineral recovery plants; other ancillary facilities; and the increased consumption of water an average of approximately 677 afpy to approximately 800 afpy in 1999 and then decreasing to approximately 437 afpy in 2006. Mining activities under the Proposed Action would commence in 1995, and would terminate in approximately 2006, extending the existing mine life by nine (9) to ten (10) years, reclamation would then commence until the year 2012. Sixty (60) million tons of ore would be leached under the Proposed Action. This would occur at the 185-acre Lamont Valley site and possibly at the 31-acre Descarga area site. Seventy-two (72) million tons of waste rock would be deposited at the 64-acre expansion of the West Valley waste rock stockpile and the new 94-acre Lamont Valley waste rock stockpile. Portions of the proposed Rand Project would occupy land that has been previously disturbed by both RMC's ongoing operations and surface and underground mining and prospecting operations which began in the 1890's. The Rand Project boundary and locations of the proposed facilities are shown in Figure 2-5.

The proposed project would encompass a maximum of approximately 511 acres of new surface disturbance associated with the expansion activities. An itemized list of the proposed new surface disturbance associated with the Rand Project, as well as the existing surface disturbance and the undisturbed acreage is presented in Table 2-8. The disturbance under the proposed Rand Project disturbance relative to permitted operations is shown in Figure 2-5.

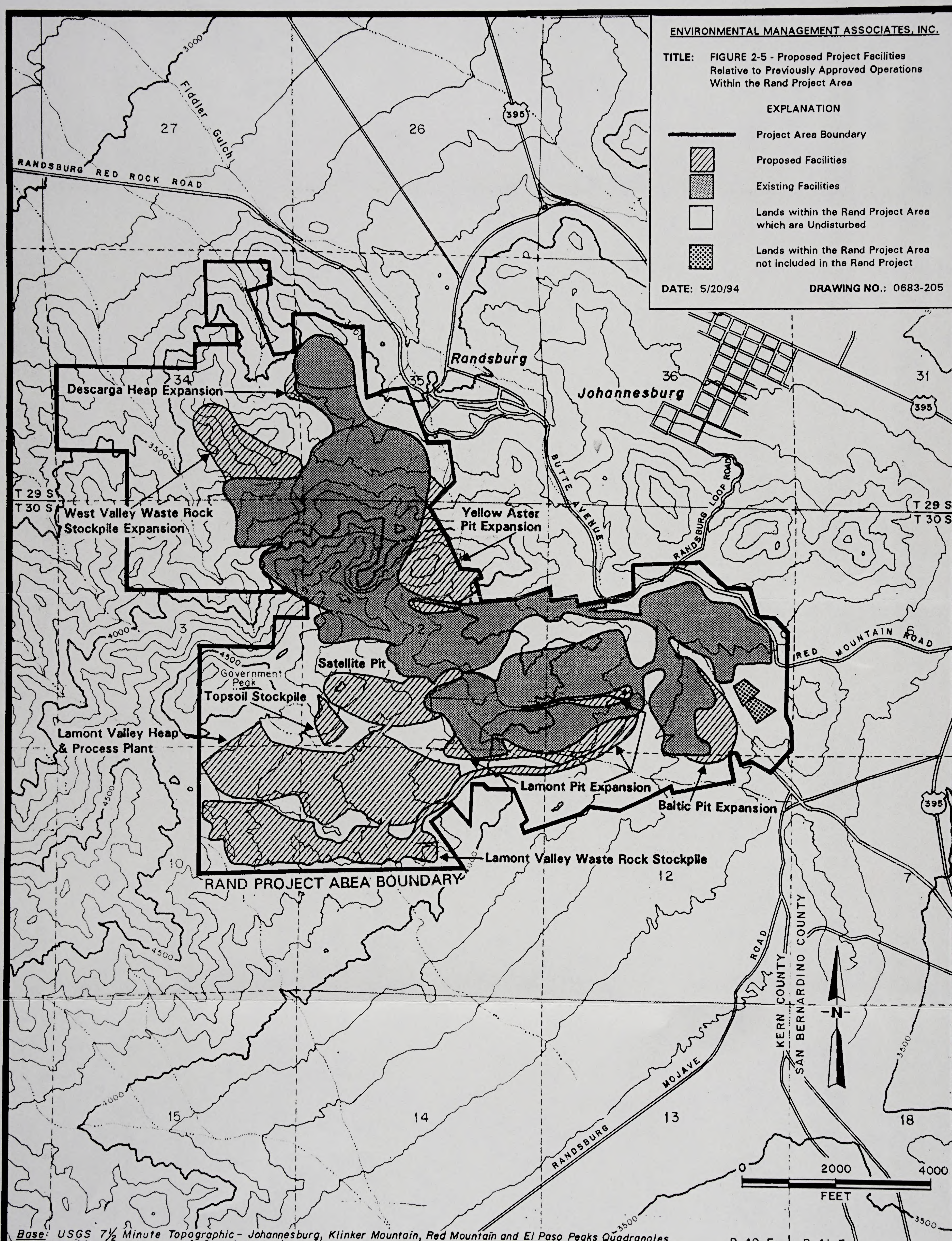

ENVIRONMENTAL MANAGEMENT ASSOCIATES, INC.
TITLE: FIGURE 2-5 - Proposed Project Facilities Relative to Previously Approved Operations Within the Rand Project Area
EXPLANATION
Project Area Boundary
Proposed Facilities
Existing Facilities
Lands within the Rand Project Area which are Undisturbed
Lands within the Rand Project Area not included in the Rand Project
DATE: 5/20/94
DRAWING NO.: 0683-205
Fiddler Gulch
RANDSBURG RED ROCK ROAD
Randsburg
Johannesburg
BUTTE AVENUE
RANDSBURG LOOP ROAD
RED MOUNTAIN ROAD
Descarga Heap Expansion
West Valley Waste Rock Stockpile Expansion
Yellow Aster Pit Expansion
Satellite Pit
Government Peak
Topsoil Stockpile
Lamont Valley Heap & Process Plant
Lamont Pit Expansion
Baltic Pit Expansion
Lamont Valley Waste Rock Stockpile
RAND PROJECT AREA BOUNDARY
T 29 S
T 30 S
KERN COUNTY
SAN BERNARDINO COUNTY
RANDSBURG MOJAVE ROAD
N
0
2000
4000
FEET
R 40 E
R 41 E
Base: USGS 7½ Minute Topographic - Johannesburg, Klinker Mountain, Red Mountain and El Paso Peaks Quadrangles.

Table 2-8: Estimated Approved and Proposed Disturbance and Undisturbed Areas for the Rand Project

MINE FACILITY COMPONENT	ACRES	MINE FACILITY COMPONENT	ACRES
Yellow Aster Pit Expansion	52	Lamont Valley Leach Facility	185
Baltic Pit Expansion	18	Descarga Area Leach Facility Expansion	4
Lamont Pit Expansion	21	Haul and Exploration Roads	21
Satellite Pit	41	West Valley Waste Rock Stockpile Expansion	64
Lamont Valley Waste Rock Stockpile	94	Lamont Valley Topsoil Stockpile	11
TOTAL PROPOSED SURFACE DISTURBANCE			511
TOTAL EXISTING SURFACE DISTURBANCE			761
TOTAL UNDISTURBED AREAS			1,248
TOTAL PROJECT AREA			2,520

2.3.2. Mining

Based on the results of ongoing exploration and development drilling, additional ore zones have been identified adjacent to and within the three (3) existing pits (Yellow Aster, Baltic and Lamont). In addition, small associated areas of satellite mineralization have been identified within the Rand Project area. Current estimates of final pit dimensions as a result of the development of these additional ore zones are shown in Table 2-9. Drilling within the area defined as the ore body was carried out with sufficient detail to adequately define the reserves. In the waste rock stockpile and leach pad areas, drilling was conducted on approximately 400-foot centers to identify possible open pit-type reserves. Drilling results from the waste rock stockpile and heap areas indicated that scattered gold values were present, but no continuity between assays or holes were identified that would indicate a minable reserve.

Table 2-9: Approximate Proposed Final Surface Dimensions, Maximum Depth from the Surface, and Pit Floor Elevations of the Open Pits

PITS	LENGTH (ft)	WIDTH (ft)	DEPTH (ft)	PIT FLOOR (elev)
Yellow Aster	4,400	3,000	800	3,600
Baltic	2,400	1,500	440	3,400
Lamont	4,000	1,100	380	3,660
Satellite	2,300	1,000	400	3,700

Ore and waste removal for development of these additional ore zones would be conducted in the same manner as the existing mining operations. There is no anticipated change in the mining rate from the current average of approximately 45,000 tpd. The type of equipment to be used would be the same as is currently being used for the existing operations. Blasting would still be done between three (3) and five (5) times per week during the daylight hours.

2.3.3. Waste Rock Stockpiles

Two (2) new or expanded waste rock stockpile areas are proposed: one (1) would be located west of the Lamont open pit in the Lamont Valley area, and the other would be an expansion of the West Valley waste rock stockpile located northwest of the Yellow Aster open pit (Figure 2-5). Together, these stockpiles would contain as much as 72 million tons of rock when the Rand Project is completed.

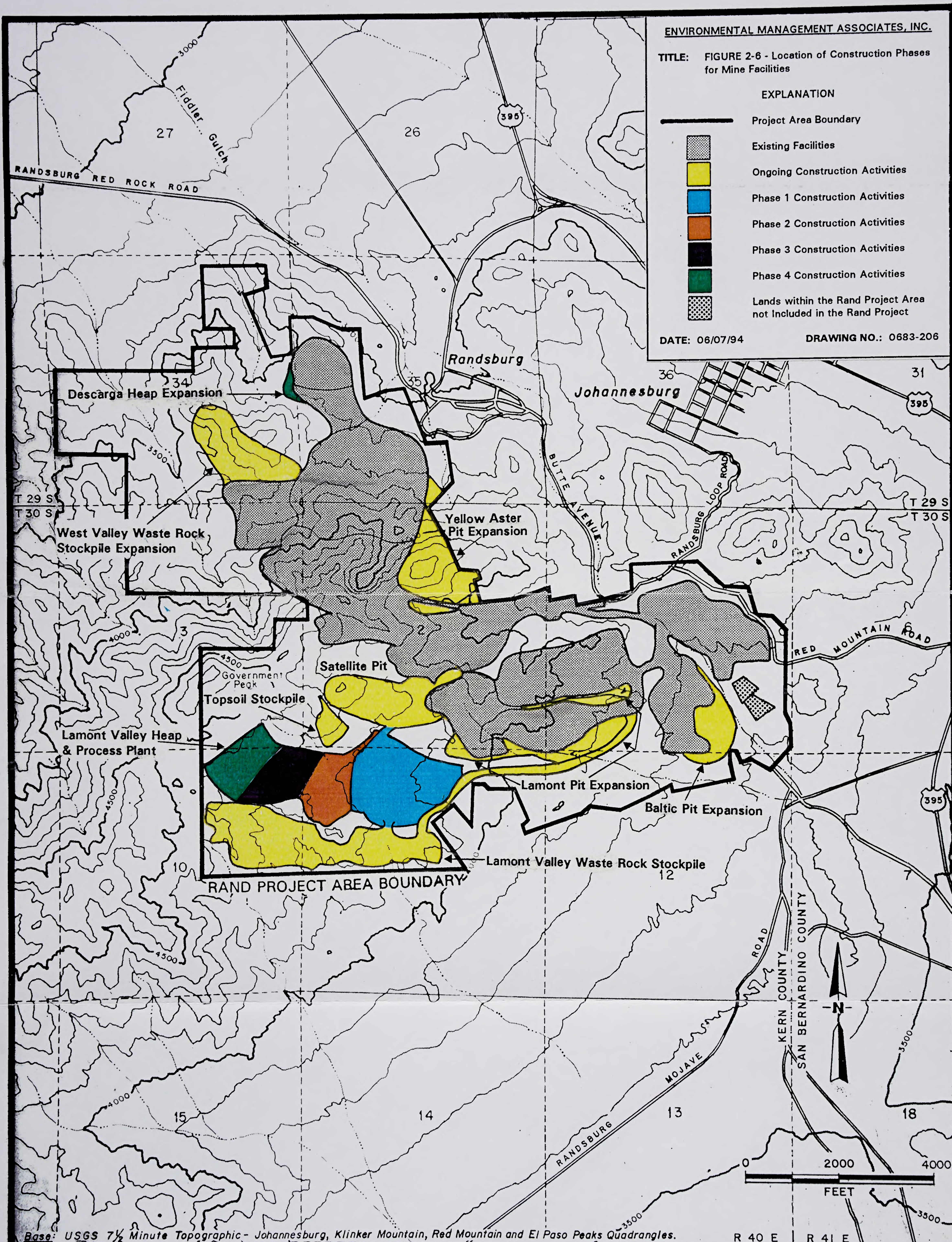
No segregation of waste material is planned for the waste rock stockpiles. Since the internal ore cutoff grade is so low (0.008 to 0.010 ounces per ton (opt) gold), and the normal analytical error is one-quarter of the cutoff value, it would not be possible to reliably determine grade differences in the waste rock. It is anticipated that waste rock sent to the waste rock stockpile would have an average grade (value) of less than 0.004 opt. The detection limit for assays reporting purposes is 0.002 opt and the potential analytical error (precision) is plus-or-minus approximately 0.0025 opt. Factoring in the accuracy and precision of the assays, the actual grade of a given load of waste rock could be anticipated to range from 0.0015 to 0.0065 opt. This means that any given load of waste rock could have a gold content that essentially ranges from zero (0) to the internal cutoff and it would not be possible to actually determine where in that range a particular load would fall. Therefore, no attempt would be made to segregate the materials, based on gold content, that would be sent to the waste rock stockpile.

2.3.4. Ore Processing Facilities

Development of the two (2) proposed heap leach facilities would include the construction of two (2) heap leach pads and associated pregnant and barren solution ponds. Proposed are the staged construction of a 185-acre heap leach facility with a 165-acre pad in the Lamont Valley and a 31-acre heap leach facility in the Descarga area. A map identifying each phase of the proposed pad construction is presented in Figure 2-6. The Lamont Valley area heap leach pad would be designed to hold 60 million tons of ore, and the Descarga area heap leach pad would be designed to hold six (6) million tons of ore. The Descarga area heap leach facility would replace the existing facility at that location. All material on the existing Descarga pad would be placed on the new pad. The run-of-mine ore would be stacked in 25-foot lifts on each pad.

The heap leach facility to be located in the Lamont Valley area would be utilized as the primary processing facility for activities included in the Rand Project. Initially, a heap leach facility to replace the one currently located in the Descarga area would not be constructed. However, should logistical and/or economic factors dictate, this facility would then be constructed and operated.

The two (2) leach pad sites would be graded to form uniform, gently sloping pads with an average slope of approximately six (6) percent. A combination service road and containment dike would be constructed around the perimeter of the pads to channel process solution and rainfall runoff from the heaps to the barren and pregnant ponds. Interceptor ditches would be constructed to divert surface runoff around the facilities. The heap leach pads, as well as the collection channels and process ponds, would be constructed in stages and designed as lined



ENVIRONMENTAL MANAGEMENT ASSOCIATES, INC.

TITLE: FIGURE 2-6 - Location of Construction Phases for Mine Facilities

EXPLANATION

- Project Area Boundary
- Existing Facilities
- Ongoing Construction Activities
- Phase 1 Construction Activities
- Phase 2 Construction Activities
- Phase 3 Construction Activities
- Phase 4 Construction Activities
- Lands within the Rand Project Area not Included in the Rand Project

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facilities with leak detection systems, as explained below, in conformance with the CRWQCB-LR requirements.

Barren, Pregnant and Stormwater Ponds

The barren/pregnant solution ponds at each facility would be constructed immediately down-slope from the leach pad. Leach solution and rainfall runoff from the heap would drain by gravity directly to the ponds. The pregnant and barren solution ponds have been designed to hold the working volume of solution while maintaining a 2-foot freeboard after a 100-year/24-hour storm event with a simultaneous 24-hour power outage. The entire capacity of the ponds, including the stormwater pond at the Lamont Valley site, would be utilized only during a major precipitation event.

Leach Pad Liner System

Heap leach pad liners would be designed as an engineered alternative to the CRWQCB-LR prescriptive standard for a Group B mining waste, waste pile. The following is a description of the construction standard to be used for each heap leach pad facility.

The leach pad liner would consist of a 60-mil high-density polyethylene (HDPE) liner placed directly on a compacted, fine-grained soil foundation. A 12-inch layer of fine-grained material would be placed directly on the HDPE liner as a protective cushion layer. An 18-inch layer of drain rock would be placed on top of the fines layer to facilitate the collection and removal of leach solution and to minimize the hydraulic head on the synthetic liner.

The perimeter of the ore heap would be set back ten (10) feet from the toe of the containment dike. The resultant channel would carry the leach solution to the pregnant pond. The channel would have a french drain system consisting of perforated pipe covered by drain rock. In addition, certain areas would have an additional 60-mil HDPE inner liner and a leachate collection and recovery system (LCRS) consisting of HDPE drain net.

Barren and Pregnant Ponds Liner System

Each barren and pregnant pond liner would be designed as an engineered alternative to the prescriptive standard for a Group B surface impoundment. The liner system would consist of an inner 80-mil HDPE liner and an outer 60-mil HDPE liner separated by an HDPE geonet LCRS. The LCRS consists of a single layer of drain net on the pond sides and a double layer of drain net on the pond bottom.

Vadose Zone Monitoring

The vadose zone monitoring system would be essentially identical to the system approved for use at the Baltic Mine Project heap leach facility. For purposes of leak detection and corrective action, the leach pads would be divided into a number of discrete cells. Division would be accomplished by the construction of diverting berms in the solution recovery layer. Once leach solution reaches the lowest point in a given cell it would be piped directly to the solution channel at the toe of the heap. This would allow visual inspection of the solution return from each cell. A separate leak detection drain system would be constructed below the liner bedding material, coincident with each cell. This system would consist of 2-inch diameter perforated polyvinyl chloride (PVC) header pipes in a drain rock envelope fed by drain net laterals. Each lateral strip would be 5-feet wide by 100-feet long and would consist of HDPE drain net sandwiched between an upper layer of geotextile and a lower layer of 20-mil HDPE.

Heap Leach Facility Operation

The proposed heap leach facilities would be operated in a manner similar to existing Yellow Aster and Baltic facilities. The progressive lifts would be constructed in a similar manner, with an overall slope designed for operational stability and decommissioning and final reclamation.

Geotechnical engineering and design of the facilities have been completed. The ponds have been designed to hold the working volume of solution while maintaining a 2-foot freeboard after a 100-year/24-hour storm event. The factors used for the storm event calculations were: contained process solution; on-site precipitation, including direct precipitation into the pond; and a 24-hour power outage. The process ponds and overflow pond for the Lamont Valley facility would be sized to hold 66 acre-feet with two (2) feet of residual freeboard. The process pond for the Descarga facility would be sized to hold 16 acre-feet with two (2) feet of residual freeboard. At the Lamont Valley facility the capacity of the pregnant solution pond would be approximately 3.88 million gallons with a 2-foot residual freeboard and the capacity of the barren solution pond would be approximately 3.88 million gallons with a 2-foot residual freeboard. The stormwater pond would have a capacity of 9.31 million gallons with a 2-foot freeboard. At the Descarga facility the pregnant solution pond would be approximately 2.07 million gallons and the capacity of the barren solution pond would be approximately 2.07 million gallons. Both would, at capacity, have a 2-foot freeboard. The pond design also includes 1-inch mesh bird exclusion netting, attached to cables and to tie-downs off the edge of the liner. Flow within the solution ditches would be within french drains.

The carbon adsorption systems at the two (2) new heap leach facilities would be designed and operated in a similar manner to the existing facilities. The resultant gold bearing material from the carbon adsorption facilities would then be transported to the Yellow Aster DPF for further processing. The use of the Yellow Aster DPF for the further processing of the gold bearing material would result in approximately one (1) to three (3) trips per week by a pickup or van, which would carry the gold-bearing steel wool to the Yellow Aster DPF. The gold-bearing steel wool would be melted to remove the non-precious metal, leaving a precious metal doré bar.

2.3.5. Ancillary Facilities

Because the Rand Project is an expansion of existing operations, the construction of many of the ancillary facilities which would normally be required for a mining operation of this size and type are not necessary. The following discusses only those additional ancillary facilities which would be constructed and operated as part of the proposed Rand Project operations.

2.3.5.1. Manpower

Up to eight (8) new employees would be employed as a result of the proposed operations. As with the existing operations, it is anticipated that approximately 25 percent of the new employees (two (2) employees) would live locally, in the towns of Randsburg, Johannesburg and Red Mountain. Approximately 65 percent of the new employees (five (5) employees) would reside in Ridgecrest and commute to the mine site each day. The other ten (10) percent of the new employees (one (1) employee) would reside in other communities in the regional area and commute to the mine site each day. Because carpooling is prevalent in this area, approximately two (2) to three (3) additional trips per day between Ridgecrest or other communities in the region and the project site are expected. This additional traffic would be spread over a 24-hour period. During the first construction phase of the project, which would last approximately five (5) months, it is anticipated that an average of approximately 20 contract construction workers would live in Ridgecrest and commute seven (7) days a week to the project site, resulting in approximately an additional 15 trips per day.

2.3.5.2. Water Supply

All process water required for the project would be obtained from RMC's existing water supply system which is located in the northeastern portion of the Fremont Valley. All water used in the processing of the ores which does not evaporate would be recycled. Table 2-10 outlines the anticipated water consumption of the Rand Project. Under the proposed project approximately 75-percent of the water would be used in the process facility and approximately 25-percent would be used for dust control. Potable water consumption by RMC would remain essentially constant and would continue to be supplied by the RCWD.

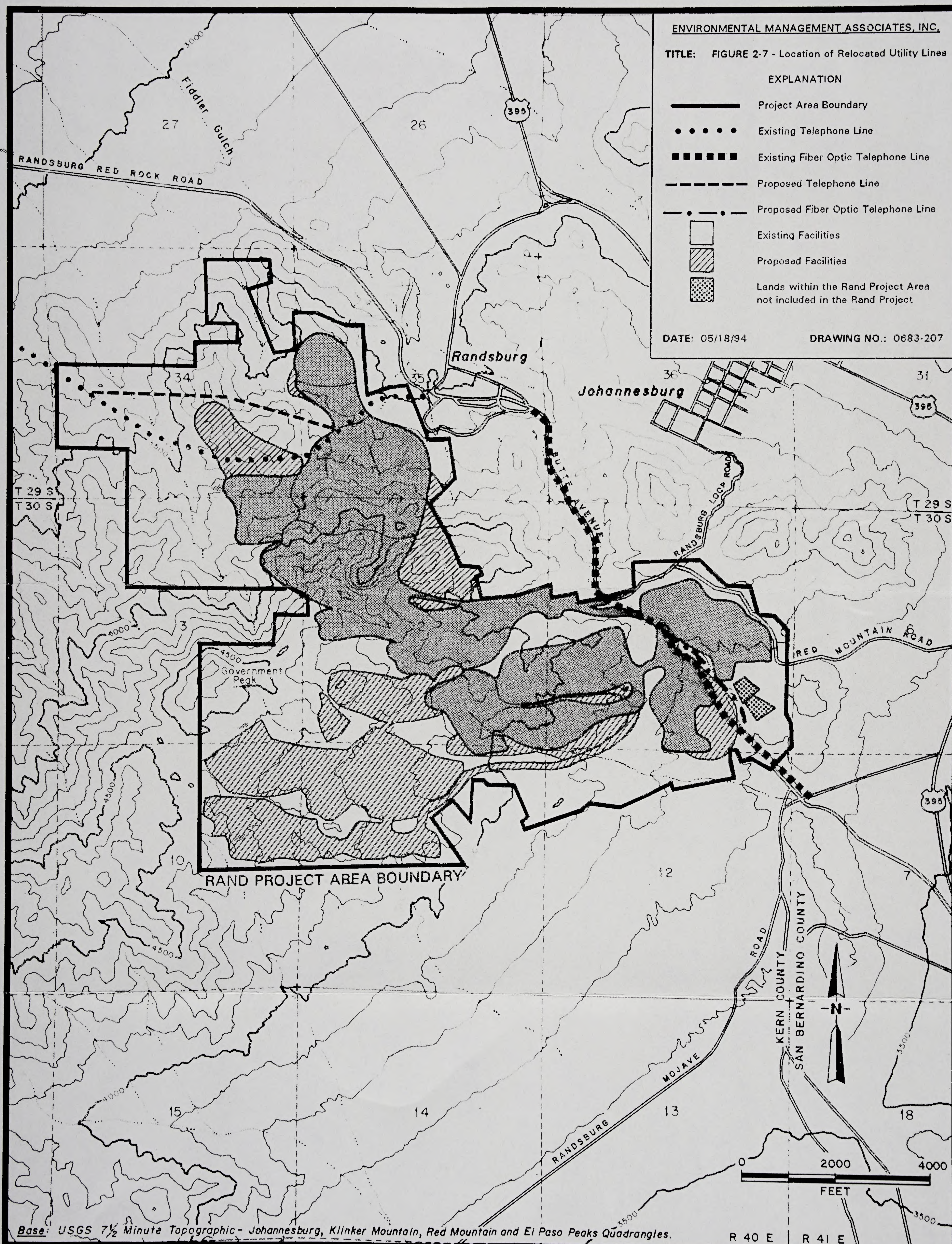
Table 2-10: Planned Approximate Water Consumption for the Rand Project[1]

YEAR	LEACHING[2]	RECLAMATION[2]	DUST CONTROL[2]	TOTAL[2]
1995	532	0	147	679
1996	607	0	147	754
1997	615	0	147	762
1998	569	58	147	774
1999	595	58	147	800
2000	554	36	147	737
2001	519	72	147	738
2002	519	36	147	702
2003	519	0	147	666
2004	519	0	147	666
2005	433	86	147	666
2006	252	142	43	437
2007	142	0	0	142
2008	41	101	0	142
2009	0	142	0	142
2010	0	41	0	41
2011	0	0	0	0
TOTALS	6,416	772	1,660	8,848

1 - Assumes the processing of 60,000,000 tons of ore
2 - Values in acre-feet per year

2.3.5.3. Power Supply and Utilities

Electrical power for the Rand Project would continue to be supplied from SCE's distribution powerlines through above-ground and/or below-ground powerlines. Emergency power requirements for the proposed facilities would be provided by two (2) 350 kW diesel-powered electric generators located at the Lamont Valley and Descarga process facilities. If required, the fiber optic telephone line currently located adjacent to the Baltic open pit would be relocated to the east (Figure 2-7). The existing telephone line in the West Valley area would be relocated to the north.



Base: USGS 7½ Minute Topographic - Johannesburg, Klinker Mountain, Red Mountain and El Paso Peaks Quadrangles.

Directional outdoor lighting for the operations would be utilized, as necessary, in the waste rock stockpile and leach pad areas when operations occur during non-daylight hours. Other facilities would have only indoor lighting, with the possible exception of "street lights" located at process plants, parking areas and entrances to buildings for safety reasons.

2.3.5.4. Chemical Storage

The type and quantities of chemicals which would be used on the Rand Project are essentially the same as those for existing operations. All chemicals, except the calcium oxide, would also be stored in closed, weather-proof containers in secured, open air storage areas. The calcium oxide would continue to be stored adjacent to the Yellow Aster and Baltic heaps. All chemicals would be stored in conformance with state and federal regulations and company safety policies.

2.3.5.5. Waste Disposal

No changes in waste disposal practices are planned as part of the proposed operations.

2.3.5.6. Roads

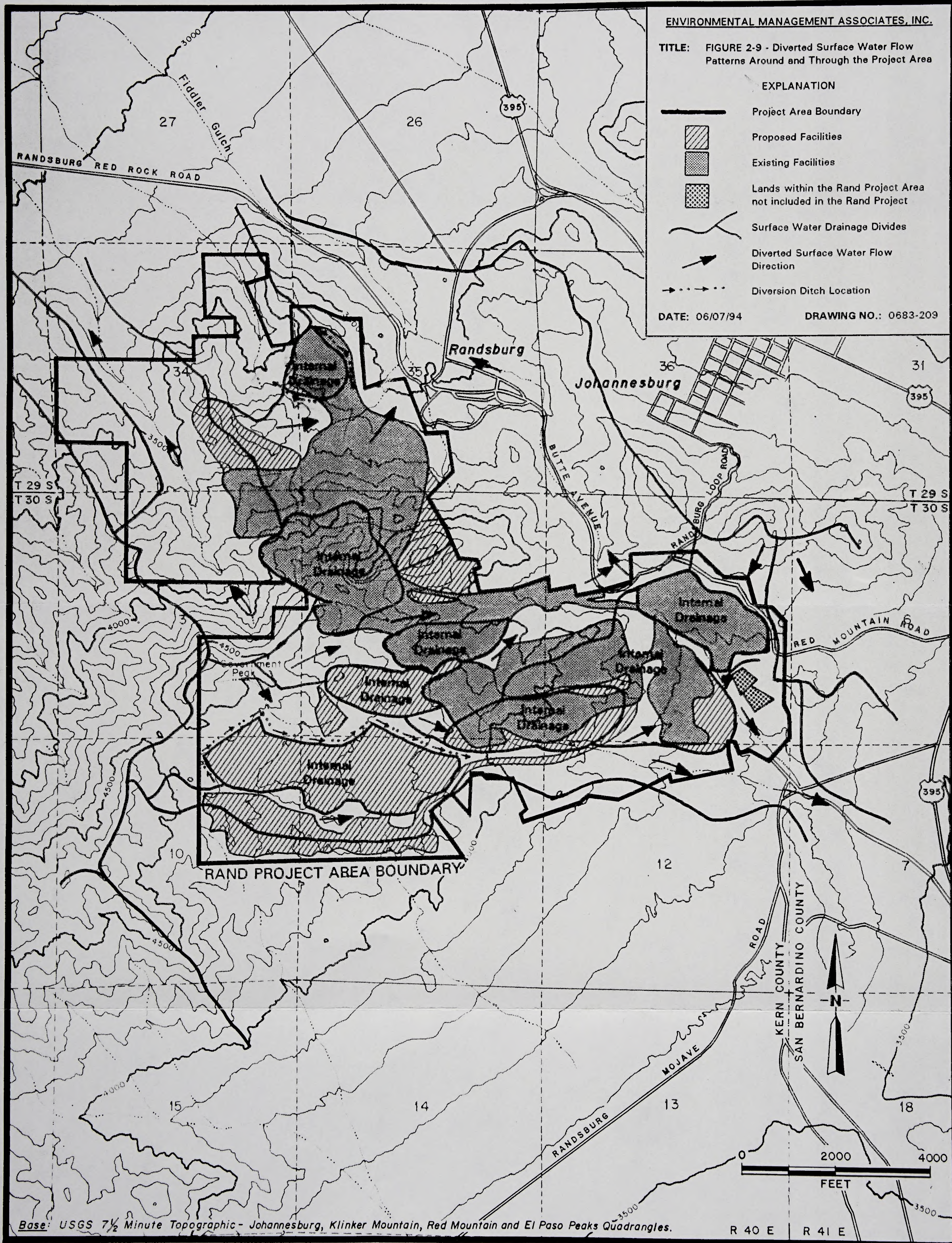
Under the proposed Rand Project, there would be no changes to access roads to the project area, and no appreciable changes to the access roads into the project area, although new temporary haul and access roads would be constructed within the project area. However, access to the existing Sunshine Mine area, which is located adjacent to the Rand Project area to the south, and which is currently provided by an existing dirt road network administered by the BLM through Section 12 and the east half of Section 11 (Township 30 South, Range 40 East, MDB&M), would be negated through construction of the Rand Project. Therefore, the Rand Project proposes to relocate access to the Sunshine Mine area by replacing the existing access road with a new dirt road located approximately 700 feet south of the Rand Project boundary in the NW ¼ of Section 12 (Figure 2-8).

Existing access to the radio and telephone facilities located on Government Peak would also be altered by the Rand Project through construction of the Lamont Valley heap leach pad. Relocated access would be provided by replacing the dirt road administered by the BLM (Route 85), which crosses through the east half of Section 11 and the NE ¼ of Section 10 (Township 30 South, Range 40 East), with a dirt road alignment to the south of the existing access in Section 10 (Figure 2-8). Although this new southern access road traverses the southeast corner of the proposed project area, proposed Rand Project activities would not commence in this portion of the Rand Project area until approximately the year 2001. Should a new access alignment be required at that time, an additional re-alignment would be designed and permits obtained in accordance with appropriate federal, state, and local agencies. These new roads would be designed to meet BLM road standards, as defined in BLM Manual Section 9113.

2.3.5.7. Ditches and Surface Flows

To minimize impacts from erosion on the project area and down surface-gradient areas, all mine facilities, such as the heap leach facilities, waste rock stockpiles, topsoil stockpiles, and roads, would be designed and constructed with appropriate erosion control features. Erosion control features would be designed to meet the performance standards of Title 14 CCR, Chapter 8, Article 9, Section 3706 (see sections of the Proposed Reclamation Plan, below). Surface runoff and drainage would be controlled and delivered to natural drainage channels at velocities that minimize erosion.

Under the Proposed Action, some additional drainages would be diverted around the project facilities. The resultant flow patterns are shown on Figure 2-9. Storm water surface flows would be routed away from the heap leach facilities by diversion ditches. Energy dissipators would be constructed at the end of the ditches to minimize the potential of erosion from the diverted


ENVIRONMENTAL MANAGEMENT ASSOCIATES, INC.
TITLE: FIGURE 2-9 - Diverted Surface Water Flow Patterns Around and Through the Project Area
EXPLANATION
Project Area Boundary
Proposed Facilities
Existing Facilities
Lands within the Rand Project Area not included in the Rand Project
Surface Water Drainage Divides
Diverted Surface Water Flow Direction
Diversion Ditch Location
DATE: 06/07/94
DRAWING NO.: 0683-209
Fiddler Gulch
RANDSBURG RED ROCK ROAD
Randsburg
Johannesburg
BUTTE AVENUE
RANDSBURG LOOP ROAD
RED MOUNTAIN ROAD
Internal Drainage
Government Peak
RAND PROJECT AREA BOUNDARY
KERN COUNTY
SAN BERNARDINO COUNTY
RANDSBURG MOJAVE ROAD
395
T 29 S
T 30 S
-N-
0
2000
4000
FEET
Base: USGS 7½ Minute Topographic - Johannesburg, Klinker Mountain, Red Mountain and El Paso Peaks Quadrangles.
R 40 E
R 41 E

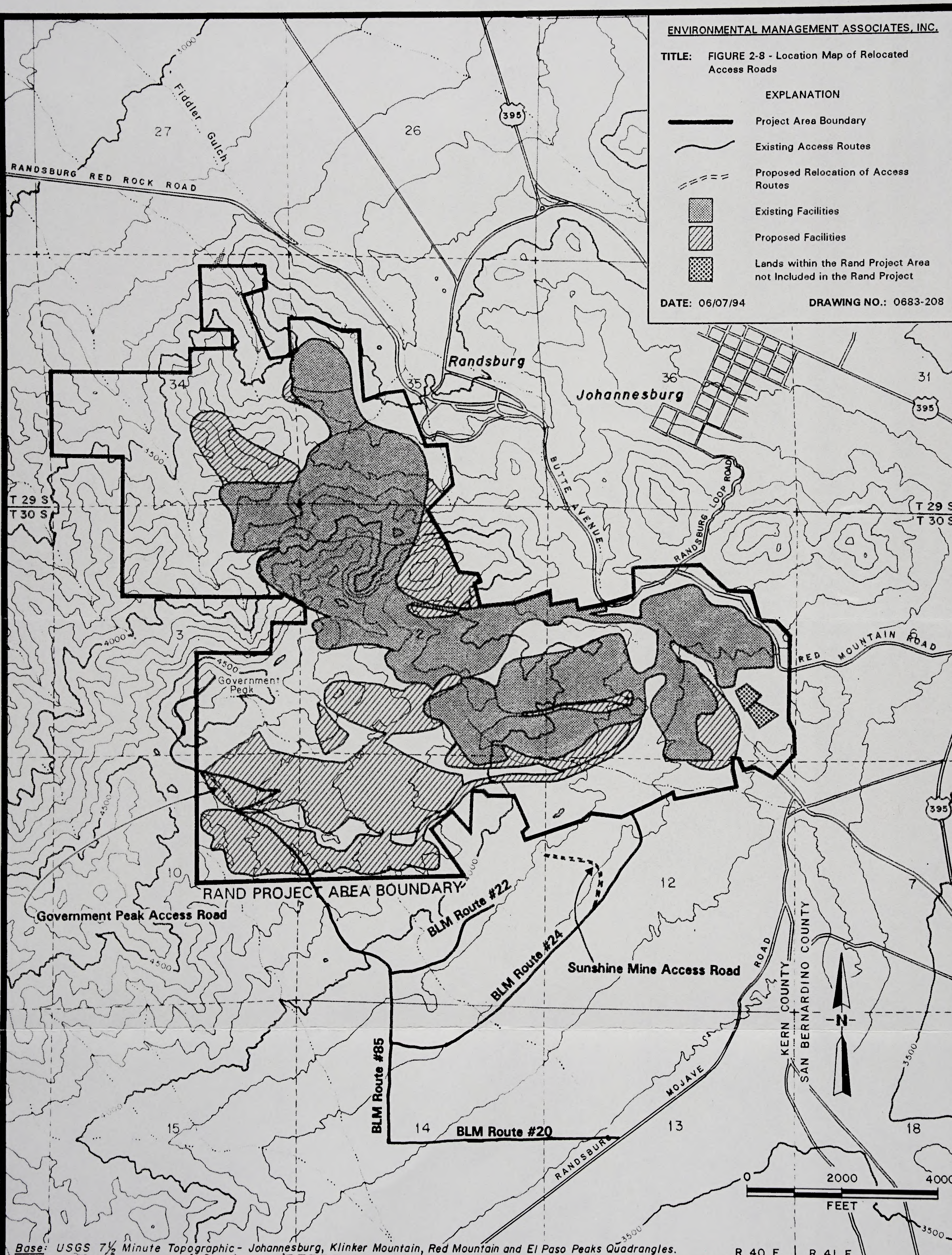
ENVIRONMENTAL MANAGEMENT ASSOCIATES, INC.

TITLE: FIGURE 2-8 - Location Map of Relocated Access Roads

EXPLANATION

Project Area Boundary
Existing Access Routes
Proposed Relocation of Access Routes
Existing Facilities
Proposed Facilities
Lands within the Rand Project Area not Included in the Rand Project

DATE: 06/07/94 DRAWING NO.: 0683-208



Base: USGS 7½ Minute Topographic - Johannesburg, Klinker Mountain, Red Mountain and El Paso Peaks Quadrangles.

run-off. Figure 2-10 shows the location and general design of the diversion ditch around the Lamont Valley and Descarga heap leach pads. All other storm water surface flows would be allowed to flow through the project area.

2.3.5.8. Fences

Prior to the initiation of construction under the Proposed Action, the ponds and project facilities would be fenced with 6-foot chain link fence. In addition, the entire project boundary would be fenced with 3-strand wire and tortoise-exclusion fence, with the exception of the BLM Route 85 corridor through the project area.

2.3.6. Exploration

Exploration activities are planned for all areas of public and private lands within the 2,520-acre Rand Project area. A total of 50 acres of disturbance is proposed under this exploration plan; however, some of the areas planned for exploration activities have been subjected to previous exploration activities. These exploration activities may include geophysical surveying, geochemical sampling, mapping, drilling and bulk sampling. The exploration drilling would be conducted in two (2) general target areas, those near and adjacent to existing mining operations, and those in areas of potential extensions of favorable geologic formations.

Construction of drill roads and pads would be conducted in a manner that allows the equipment and personnel to access the targets without unnecessary soil and vegetation disturbance. Existing roads would be used if they provide the needed access. Less than ten (10) percent of the exploration holes would be drilled using a core-drilling method. Large diameter holes would be drilled for metallurgical samples. The drilling equipment would be serviced by a water truck/pipe truck/crane truck. Drill roads would be constructed for access and would be of two (2) types: (1) Closely-spaced roads (<200 feet apart) for tighter-grid drilling (<500 feet horizontal spacing) and long-duration deep holes (>500 feet), which would be all-season, pre-development type adjacent to existing

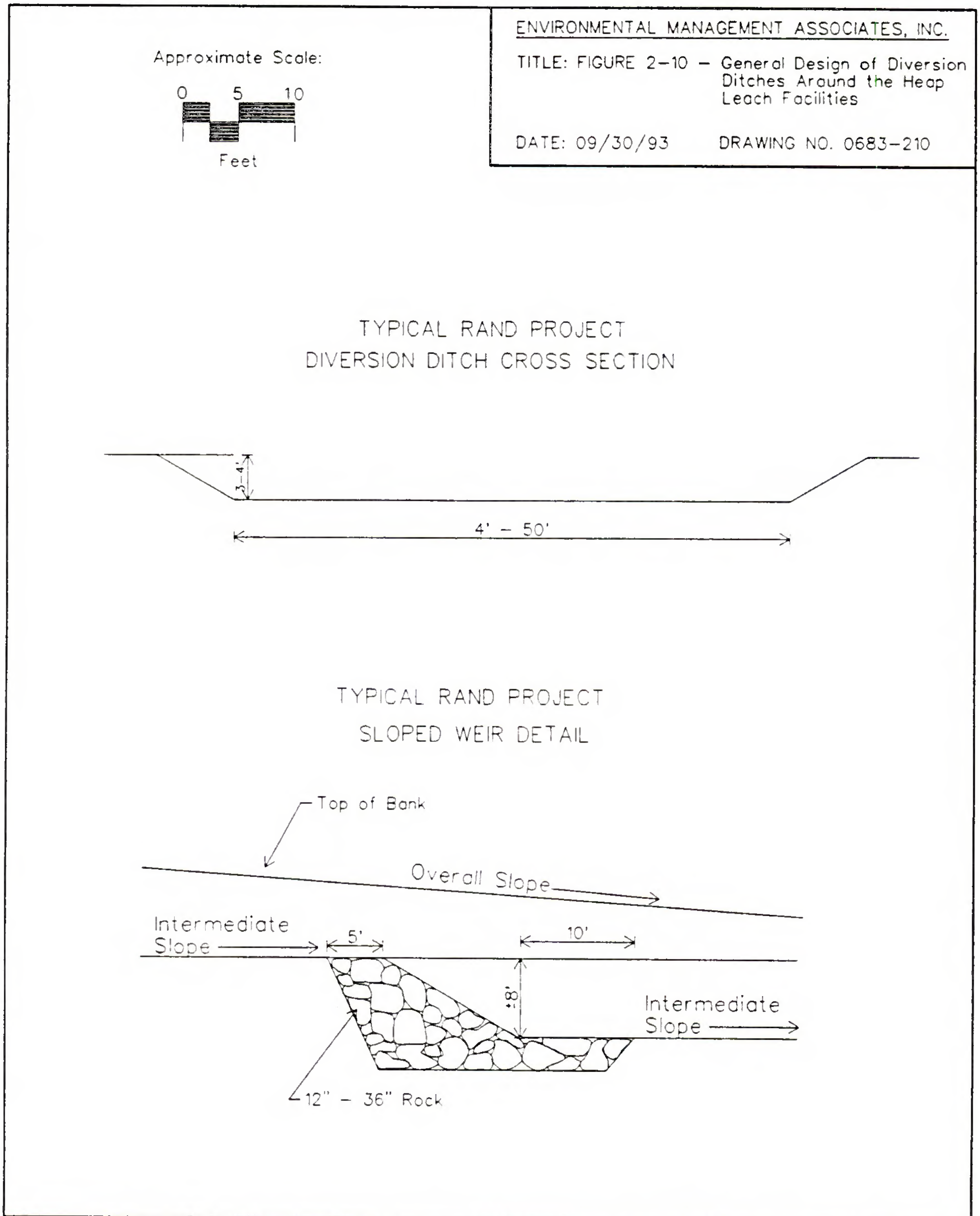


Figure 2-10: General Design of the Diversion Ditches Around the Heap Leach Facilities

mining operations; and, (2) Widely-spaced roads (>200 feet apart) for wider-grid shallow drilling (>500 feet horizontal spacing) and short-duration shallow holes (<500 feet), which would be limited-season exploration activities. Construction of a drill pad may occasionally be necessary for angle drilling or core drilling activities.

Exploration activities of all exploration drill targets would continue until the exploration acreage had been exhausted, taking into account concurrent reclamation of exploration disturbance, as discussed in the reclamation section or when all mining related activities under the plan are completed.

Water requirements for exploration activities would be supplied be RMC's existing water supply system. Existing access roads and trails would be used, except in areas where new roads or trails would be required, minimize additional surface disturbance. All exploration drill holes would be plugged in accordance with applicable State Law. Site-specific disturbance for the maximum acreage identified (50 acres) can not be identified at this time, because it is not known. However, the maximum anticipated impacts from the maximum disturbance would be used to assess anticipated impacts.

2.3.7. Detailed Reclamation Plan

2.3.7.1. Reclamation Goals

The reclamation portion of the Proposed Action addresses all surface disturbance created by the Rand Project, as outlined in Table 2-11. The Rand Project Proposed Reclamation Plan also addresses a portion of the existing surface disturbance at the Lamont and Descarga sites not covered by a reclamation plan previously approved under SMARA (the remaining portion of existing surface disturbance at the Lamont site has been included in the Baltic Mine Reclamation Plan, approved in 1992) (USDI, 1992, Appendix B). The reclamation goals of this Proposed Reclamation Plan are consistent with the land use goals for the area, which are future mining, wildlife habitat, recreation and sheep grazing. Reclamation activities would be in accordance with the regulations found at 43 CFR 3809.1-3(d) and 14 CCR 3500. The post-mining goals and objectives for reclamation of the Rand Project area are to return the land to a similar land use, to ensure public safety, and to prevent unnecessary or undue degradation of the federal and private lands during operations and until reclamation is successful.

Table 2-11: Surface Disturbance to be Reclaimed Under the Reclamation Portion of the Proposed Action

ITEM	PROJECT FACILITY	ACRES
Operations Conducted Under the Rand Project	Yellow Aster Pit Expansion	52
	Baltic Pit Expansion	18
	Lamont Pit Expansion	21
	Satellite Pits	41
	Lamont Valley Waste Rock Stockpile Expansion	94
	West Valley Waste Rock Stockpile	64
	Lamont Valley Leach Pad	185
	Descarga Area Leach Pad Expansion	4
	Lamont Valley Topsoil Stockpile	11
	Haul and Exploration Roads	21
Total Proposed Surface Disturbance for the Rand Project:		511
Other Surface Disturbance Created by RMC not already subject to a Reclamation Plan	Lamont Site	32
	Descarga Site	30
Total Surface Area to be Reclaimed under the Rand Project Proposed Reclamation Plan:		**573**

In general, the Proposed Reclamation Plan includes: measures for the protection of wildlife, livestock and the public; minimizing erosion and mass failure potential; demolition of structures and neutralization of process components; regrading of selected cut and fill slopes; and, where applicable, measures to allow for the resumption of pre-mining land uses. Implementation of the Proposed Reclamation Plan would not limit the future development of mineral resources in the area. Currently, uneconomic precious metal resources within the walls and floors of the mines would remain accessible for future development. In addition, waste material in the waste rock stockpile would be available for future development.

The reclamation approach and procedures outlined in this Proposed Reclamation Plan were developed for the site-specific conditions of the Rand Project area. The procedures were developed to address several factors which affect revegetation of the Rand Project site, including:

- Growth of desert plants is slow even under the most favorable conditions, and revegetation is also slow;

- Weather is the single most influential factor, and its extreme variability confounds revegetation planning and brings mixed results;

- Wind and dryness are enemies of revegetation; both are present in quantity on the project site;

- Artificially augmented plant growth brings on additional risk; watering and fertilization enhance leaf growth which can be supported only by continued regular care for an indefinite period of time. Also, both watering and fertilization increase plant palatability to herbivores; and

- Continued presence of herbivores reduces the likelihood of a revegetation program success.

The above-listed factors suggest that the most successful revegetation plan is one which relies primarily on natural processes and requires little intervention once site preparation is complete. The procedures are designed such that the mining-related disturbance areas are reclaimed to a productive use similar to the pre-mining land uses, and the reclaimed areas are visually and functionally compatible with the surrounding topography. The reclamation procedures proposed for the Rand Project incorporate six (6) basic components:

- Establishment of stable topographic surface and drainage conditions that are compatible with the surrounding landscape and serve to control erosion.

- Establishment of soil conditions most conducive to establishment of a stable plant community through stripping, stockpiling and reapplication of suitable growth material.

- Revegetation of disturbed areas, using plant species adapted to the area, as specified in the revegetation section of the proposed Reclamation Plan, in order to establish a long-term productive biotic community compatible with proposed post-mining land uses. The vegetative cover would be capable of self-regeneration without the long-term dependency on irrigation, soil amendments or fertilizers.

- Consideration of public safety through stabilization, removal, and/or fencing of structures or land forms that could constitute a public hazard.

- Minimize the outward regrading or reshaping of slopes to reduce further impacts to undisturbed wildlife habitat.

- Consideration of the long-term visual character of the reclaimed area.

The general reclamation goal at the Rand Project is to reclaim the site to a stable, functioning landscape unit/ecosystem to allow for similar land uses as currently exist. Present and pre-mining land use of the Rand Project area includes mining, recreation (target practice and off-highway vehicle use), wildlife habitat, and, to a lesser extent, sheep grazing. Post-mining land use is expected to be similar. Based on the existing site conditions, the Proposed Reclamation Plan proposes to establish conditions that would promote the long-term development of a creosote bush scrub vegetation community typical of the local area. The Proposed Reclamation Plan would include: measures for the protection of wildlife, livestock and the public; minimizing erosion and mass failure potential; demolition of structures and neutralization of process components; regrading of selected cut-and-fill slopes; and, where feasible, measures to allow for the resumption of pre-mining land uses. Implementation of the Proposed Reclamation Plan would not limit the future development of mineral resources in the area. Currently, uneconomic precious metal resources within the walls and floors of the mines would remain accessible for future development. In addition, waste material in the waste rock stockpile would be available for future development.

The reclamation effort would encompass several levels of activity, which would be applied as needed for each specific type of surface disturbance. The following is an explanation of the reclamation activity levels to be applied in the Proposed Reclamation Plan:

Level One: Only reclamation activities to protect the public, livestock and range wildlife. These activities would include perimeter fencing, sign posting, the installation of road berms, and stabilization of slopes, as necessary.

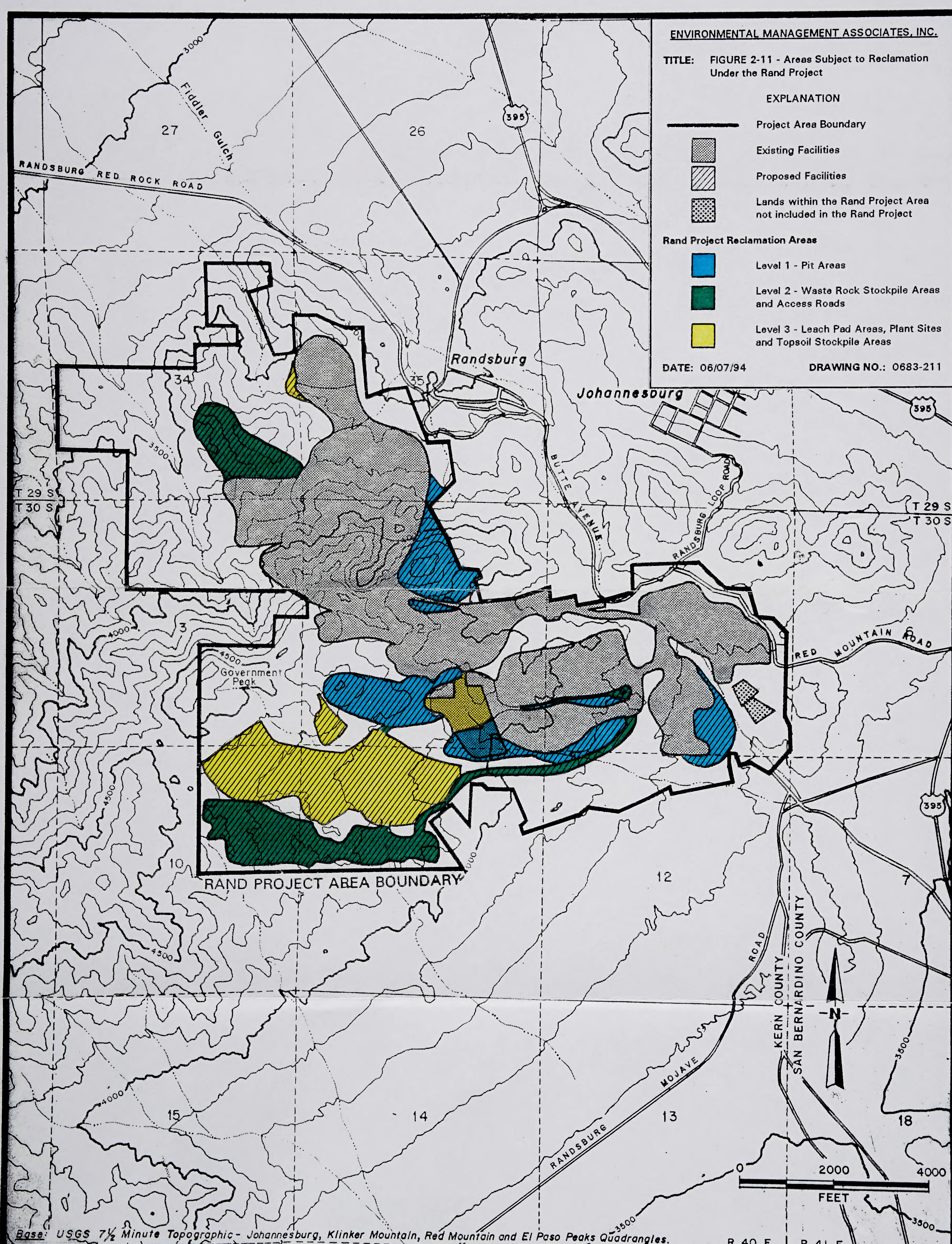
Level Two: Reclamation activities including regrading and revegetation.

Level Three: Surface structure demolition with regrading and seeding using predominantly plant species adapted to the area, as specified in the revegetation section of the proposed Reclamation Plan. Heaps and pond structures would be neutralized prior to regrading and revegetation activities.

The same level of revegetation activities would occur under Level Two and Level Three reclamation. Figure 2-11 shows which areas of the project would be subject to the specific reclamation levels outlined above.

2.3.7.2. Schedule

Reclamation of the Rand Project would be initiated when individual process components are no longer required for mine operations or when facilities are decommissioned and site closure begins. Removal of facilities, rough grading and scarifying activities may occur at any time during the project. When ore reserves are exhausted, mining operations would stop. Leaching operations would stop after uneconomic recovery rates are reached. Closure would commence after reclamation earthwork is completed. It is foreseeable that the heap leaching activities would remain active after mining activities have stopped, due to the length of time required to complete leach cycles. In this case, open pit and some ancillary facility reclamation and closure activities would occur in advance of heap leach reclamation and closure.


ENVIRONMENTAL MANAGEMENT ASSOCIATES, INC.
TITLE: FIGURE 2-11 - Areas Subject to Reclamation Under the Rand Project
EXPLANATION
Project Area Boundary
Existing Facilities
Proposed Facilities
Lands within the Rand Project Area not included in the Rand Project
Rand Project Reclamation Areas
Level 1 - Pit Areas
Level 2 - Waste Rock Stockpile Areas and Access Roads
Level 3 - Leach Pad Areas, Plant Sites and Topsoil Stockpile Areas
DATE: 06/07/94
DRAWING NO.: 0683-211
Randsburg
Johannesburg
Fiddler Gulch
RANDSBURG RED ROCK ROAD
BUTTE AVENUE
RANDSBURG LOOP ROAD
RED MOUNTAIN ROAD
MOJAVE RANDSBURG ROAD
Government Peak
RAND PROJECT AREA BOUNDARY
KERN COUNTY
SAN BERNARDINO COUNTY
395
T 29 S
T 30 S
R 40 E
R 41 E
27
26
35
34
3
2
10
12
6
7
15
14
13
18
N
0
2000
4000
FEET
Base: USGS 7½ Minute Topographic - Johannesburg, Klinker Mountain, Red Mountain and El Paso Peaks Quadrangles.

Soil distribution and revegetation activities are limited by the time of year during which they can be effectively implemented. Table 2-12 outlines the anticipated revegetation schedule on a monthly basis which would be followed to achieve the reclamation goals set forth above. Site conditions and/or yearly climatic variations may require that this schedule be modified to achieve revegetation success.

Table 2-12: Anticipated Reclamation Schedule

TECHNIQUES	MONTH J F M A M J A S O N D
Soil Distribution	/---------------------/
Seedbed Preparation	/-------------/
Seeding	/----/ /----/
Note: Regrading activities could occur year round.	

Concurrent and Interim Reclamation

Concurrent reclamation activities would begin with the stabilization and seeding of the growth media stockpiles during the construction phase of the mine and leach pad complexes. Areas no longer needed for mining activities would be available for concurrent reclamation. Concurrent reclamation would involve stabilization and seeding of new or upgraded access roads, cut and fill slopes, solution pond berms, waste rock dump benches and bare areas around buildings. The interim reclamation of topsoil stockpiles would consist of either seeding with a nitrogen-fixing species or an annual grass species, or on-site trials would be conducted with different species and/or planting techniques on portions of the stockpile. Exploration roads would be reclaimed concurrently with mining operations when it is determined that the roads are no longer needed for exploration or mining operations.

Post-Closure Reclamation

Closure and post-closure reclamation activities would commence when the ore bodies are exhausted and mining has ceased. It is estimated that this terminal phase of reclamation would take one (1) to three (3) years to complete following cessation of mining. Post-closure monitoring of vegetation success, erosion control procedures and water quality in the ponds is expected to account for an additional two (2) to six (6) years.

2.3.7.3. Revegetation Activities

To aid in the revegetation of the project area, the naturally vegetated areas between the disturbed areas, such as between roads and pits, would be managed as undisturbed buffers to serve as a natural seed source and provide protection for small mammals and reptiles. In addition to these undisturbed buffers, other revegetation activities include: contouring and shaping, soil salvage and stockpile areas, revegetation of test plots, topsoil reapplication, seedbed preparation, seeding and planting, and seed mixtures and rates.

Contouring and Shaping

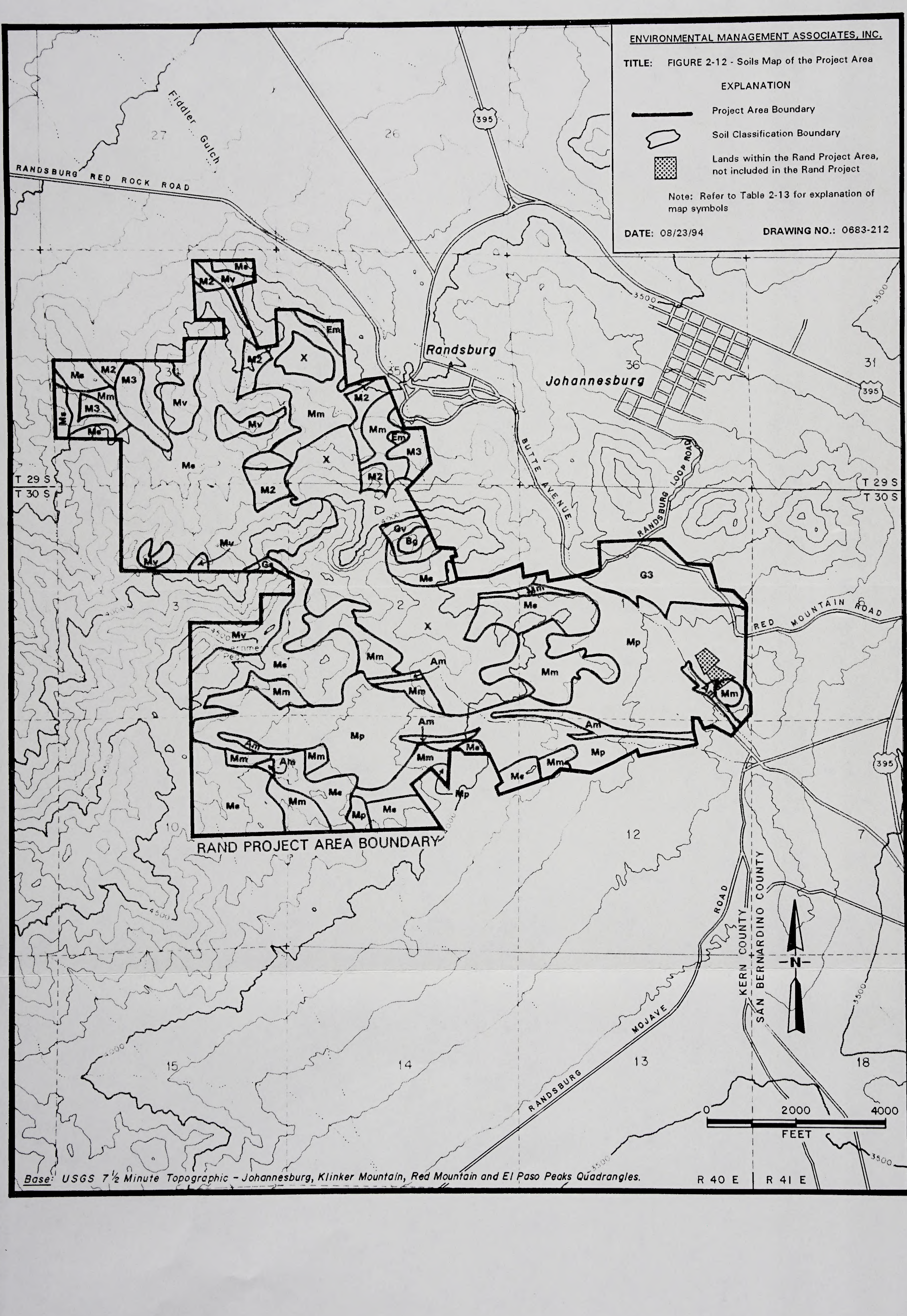
Slopes would be shaped for reclamation depending on the type of material, erodibility, and the considerations of the mining process. Overall slope grades would range from near 1 horizontal (1H):1 vertical (1V) (45 degrees) for the pit walls to near-flat. After closure, the pit highwalls would be left in a stable configuration, subject to natural processes.

Final grading of cuts and fills in unconsolidated material would create undulating land forms that are stable, do not allow for extensive pooling or ponding, and blend with the surrounding undisturbed topography. Final grading would minimize erosion potential and additional surface disturbance and would facilitate the establishment of post-mining vegetation. Sharp edges would be rounded and straight lines would be altered to provide contours which are visually and functionally compatible with the surrounding terrain.

Soil Salvage and Stockpile

Within the Rand Project area there are 12 soil map units (Figure 2-12; Table 2-13; Appendix C). Approximately 50 percent of the soils in the portions of the project area to be disturbed as part of the proposed project have surface horizons of between three (3) and six (6) inches and a total soil depth of between ten (10) and 20 inches. Another approximately 40 percent of the soils in the portions of the project area to be disturbed as part of the proposed project have surface horizons of between six (6) and nine (9) inches and a total soil depth of between 20 and 40 inches. RMC plans to stockpile as much topsoil as possible from these areas to be disturbed. The top 0 to 20 inches of soil material from all soils in the project area would be salvaged. In addition, the soils which are associated with active drainages which have soil depths in excess of 20 inches would be salvaged to the greatest depth possible. Prior to construction, soil material would be removed and stockpiled for later use during reclamation activities. Assuming that an average of ten (10) inches of soil material is salvaged, approximately 687,000 cubic yards of topsoil would be stockpiled at the proposed Lamont Valley topsoil stockpile area, or at other existing topsoil stockpiles (Figure 2-5). The Lamont Valley topsoil would be clearly identified with signs to assure that the material was not misidentified as waste rock material. The Lamont Valley topsoil stockpile would not be relocated without written approval from the BLM and Kern County.

The interim reclamation of the soil stockpile would consist of either seeding with a nitrogen-fixing species or an annual grass species, or on-site trials would be conducted with different species and/or planting techniques on portions of the stockpile. Concurrent with the soil salvage operations, RMC would transplant to the soil stockpile areas juvenile, less than four (4) feet, non-articulated Joshua trees, Golden cholla and Beavertail which are located in areas to be disturbed. RMC would try to avoid the removal of Joshua trees, Golden cholla and Beavertail during construction, operation and reclamation activities. Erosion control methods would be used to re-route any storm flows around the stockpiles to natural drainages at velocities that would minimize erosion.



ENVIRONMENTAL MANAGEMENT ASSOCIATES, INC.

TITLE: FIGURE 2-12 - Soils Map of the Project Area

EXPLANATION

Project Area Boundary

Soil Classification Boundary

Lands within the Rand Project Area, not included in the Rand Project

Note: Refer to Table 2-13 for explanation of map symbols

DATE: 08/23/94

DRAWING NO.: 0683-212

Table 2-13: Characteristics of Soil Series Within the Project Area[1]

SOIL NAME	SOIL MAP UNIT	FACTORS				
		Permeability	Water Capacity	Surface Runoff	Water Erosion	Wind Erosion
Fluventic Camborthids	Am: Floodplains	Moderately Rapid	Low	Slow	Low	High
Shallow Typic Haplargids	Bg: Granitic Butte	Moderate	Low	Moderate	Moderate	High
Typic Torriorthents	Em: Eolian Sand	Moderate	Very Low	Low	Low	Very High
Orthids-Argids-Orthents	Gp: Granitic Pediments	Moderate	Very Low to Moderate	Moderate to Rapid	Moderate to High	High
Shallow Torripsamments	Gs: Steep Granitic Terrain	Rapid	Very Low	Rapid	High	High
Camborthids- Rock Outcrop	Gv: Very Steep Granitic Terrain	Moderate	Low to Moderate	Rapid	High	High
Very Gravelly Typic Haplargids	M2: Gently Sloping Pediments	Slow	Low to Moderate	Moderate	Moderate	Low
Haplargids-Camborthids	M3: Moderately Sloping Pediments	Slow to Moderate	Low to Moderate	Moderate to Rapid	Moderate	Low
Shallow Typic Camborthids	Mm: Moderately Steep Hills	Moderate	Low	Rapid	Moderate	Low
Gravelly Typic Haplargids	Mp: Dissected Pediments	Slow	Moderate	Moderate	Moderate	Low
Camborthids-Lithic Torriorthents	Ms: Steep Metamorphic Terrain	Moderate	Very Low to Low	Rapid to Very Rapid	Moderate	Low
Torriorthents-Camborthids	Mv: Very Steep Metamorphic Terrain	Moderate	Very Low to Low	Rapid to Very Rapid	Moderate	Low
Unclassified	X: Mechanically Disturbed Land	N/A	N/A	N/A	N/A	N/A

[1] - Alexander, 1993

Revegetation Test Plots

As part of RMC's revegetation activities, a program of test plots to assess species and techniques for revegetation would be implemented. A plan specifying the test plot activities would be prepared and implemented. Results from the test plot activities would be summarized in the annual report submitted to the BLM and Kern County and appropriate recommendations incorporated into the ongoing reclamation activities.

Topsoil Reapplication

Sufficient stockpiled topsoil would be present at the Lamont Valley topsoil stockpile to cover all the areas to be revegetated under the Level Two and Three guidelines. Compacted areas would be ripped prior to reapplication of the topsoil. Topsoil would be placed on the prepared areas in the early fall, just prior to seeding which would occur in the late fall. Topsoil placement would be inspected periodically to ensure a sufficient depth of material is being placed. The surface would be left in a rough or furrowed state to reduce wind and water erosion and to increase available soil moisture in the topsoil layer.

Seedbed Preparation

Seedbed preparation, seeding, and transplant efforts for areas to be revegetated (Level Two and Level Three reclamation areas) would take place after grading, stabilization and growth media placement; however, when soil moisture conditions are so high that compaction would occur during seedbed preparation activities, those activities would cease until soil moisture conditions drop to acceptable levels. The seedbed preparation activities would be performed as follows:

- Compacted surfaces would be loosened and left in a rough condition by ripping.

- Based on the results of the topsoil testing, if soil fertility levels or soil constituents are inadequate to successfully implement the revegetation program, then soil amendments may be applied, and the surface disked, raked or treated to incorporate the amendments into the top 4 to 6 inches. Preference would be given to slow-release fertilizers, including mineral and organic materials that mimic natural sources, which would be added in amounts similar to those found in the reference soils under natural vegetation of the type being reclaimed. Soil amendments, including, but not limited to, wood chips, calcium chloride, organic mulches, gypsum and lime, may be incorporated into the soil to help mitigate compaction problems, improve water infiltration, neutralize acidic or alkaline conditions, modify soil structure, and enhance water holding capacity. Mulches, including rice straw, crushed rock, hay, biodegradable fibers, wood chips, wood fiber and jute, may be used, provided noxious weed seeds are not introduced to the revegetation site.

- The prepared surfaces would then be seeded using the mixtures and seeding rates as presented in Table 2-14. Species in this seed mix may include both spring and summer germinators. Seeding would either be by rangeland drill, broadcasting or hydraulic seeder, depending on working area and steepness of slope.

- In selected areas, RMC may consider the use of mulch on the relatively harsh sites, such as south-facing slopes.

- In selected areas, RMC may utilize irrigation to enhance revegetation and to promote stabilization of the surface material. This procedure would likely be conducted in, but may not be limited to, the spring season to simulate and supplement natural precipitation, and would likely not continue into the summer. This process would not be conducted on a recurring basis.

Seeding and Planting

The rocky terrain and soil materials in the project area may dictate broadcast seeding, although a range drill would be used in suitable flat terrain. An alternative to seeding for the revegetation activities would be to plant containerized juvenile creosote bushes at a rate of up to 75 percent of the density of creosote bushes in an adjacent undisturbed area. This technique may be used in areas where seeding may not be an acceptable alternative, or where seeding may not be feasible. In addition, the Joshua trees, Golden cholla and Beavertail which were salvaged during the construction phase would be transplanted to the reclaimed areas.

Table 2-14: Species for Use in Seed Mix for Final Reclamation of the Rand Project

SPECIES		APPLICATION RATE (lbs PLS/Acre[1])
SCIENTIFIC NAME	**COMMON NAME**	
GRASSES:		
Oryzopsis hymenoides	Indian Rice Grass	4
Stipa speciosa	Desert Needlegrass	4
	GRASSES TOTAL:	8
SHRUBS:		
Ambrosia dumosa	Burrobush	4
Larrea tridentata	Creosote Bush	4
	SHRUBS TOTAL:	8
GRAND TOTAL:		**16**

1 - PLS equals pure live seed: Broadcast Rate shown; drilled seeding rate equals half of broadcast rate.

Seeding Mixtures and Rates

The seed mixtures to be used on the site have been determined by pre-mining vegetation and habitat types that exist in the area, known climatic and soil conditions of the project area and, to a lesser extent, seed availability. The seed mixtures presented are preliminary in nature and would be finalized based on site-specific reclamation studies conducted on areas undergoing concurrent reclamation and consultation with the BLM and Kern County. The seed mixtures would be either broadcast seeded or drilled. Final choice of plant species would be dependent on commercial availability of seed. Commercial seeds would be purchased from as local a source as possible. In addition, RMC may collect seeds from the project area to use in on-site trials and during final reclamation. Any substitutions to the seed mix would be approved by the BLM and Kern County. For broadcast applications, equipment such as a "cyclone" spreader would be used to distribute 16 pounds per acre of pure live seed, followed by dragging with a light chain or other means to provide some soil cover on the seed. When possible, a range drill would be used for more effective seeding. An application rate of eight (8) pounds of pure live seed per acre would be used with the range drill and seeds would be placed at a depth of 2 to 3 inches.

Weed Control

During the initial stages of the revegetation process, invader (weed) species would be expected in the revegetated areas. As the revegetation process progressed, the natural succession of species would tend the force the invader species from the area. Weed species in revegetated areas would be managed: when they threaten the success of the proposed reclamation; to prevent spreading to nearby areas; and to eliminate fire hazard. Topsoil stockpiles and areas prepared for revegetation will be seeded as quickly as possible to prevent invasion by weeds. Methods to control undesirable species would be primarily through hand cultivation, although mechanical cultivation would be considered, based on the extent of the problem.

2.3.7.4. Facilities Closure/Dismantling

The tortoise exclusion fencing constructed for the project operations would be maintained inplace until revegetation was completed and determined successful for bond release by the BLM and Kern County. At that time, the fencing would be removed.

Topsoil Stockpiles

After growth media has been removed from the stockpiles for replacement on other sites, the surface would be loosened, if necessary, to alleviate compaction and seeded with the appropriate seed mixture for the area as described under the Level Three guideline.

Pits Closure

During active mining, reclamation in and around the pits would be limited to controlling erosion of the haul roads. Upon final closure, the mines would be reclaimed under the Level One guideline, leaving pit sidewalls in a stable condition, in accordance with Mine Safety and Health Administration regulations. A typical cross section of the final configuration of a pit wall is

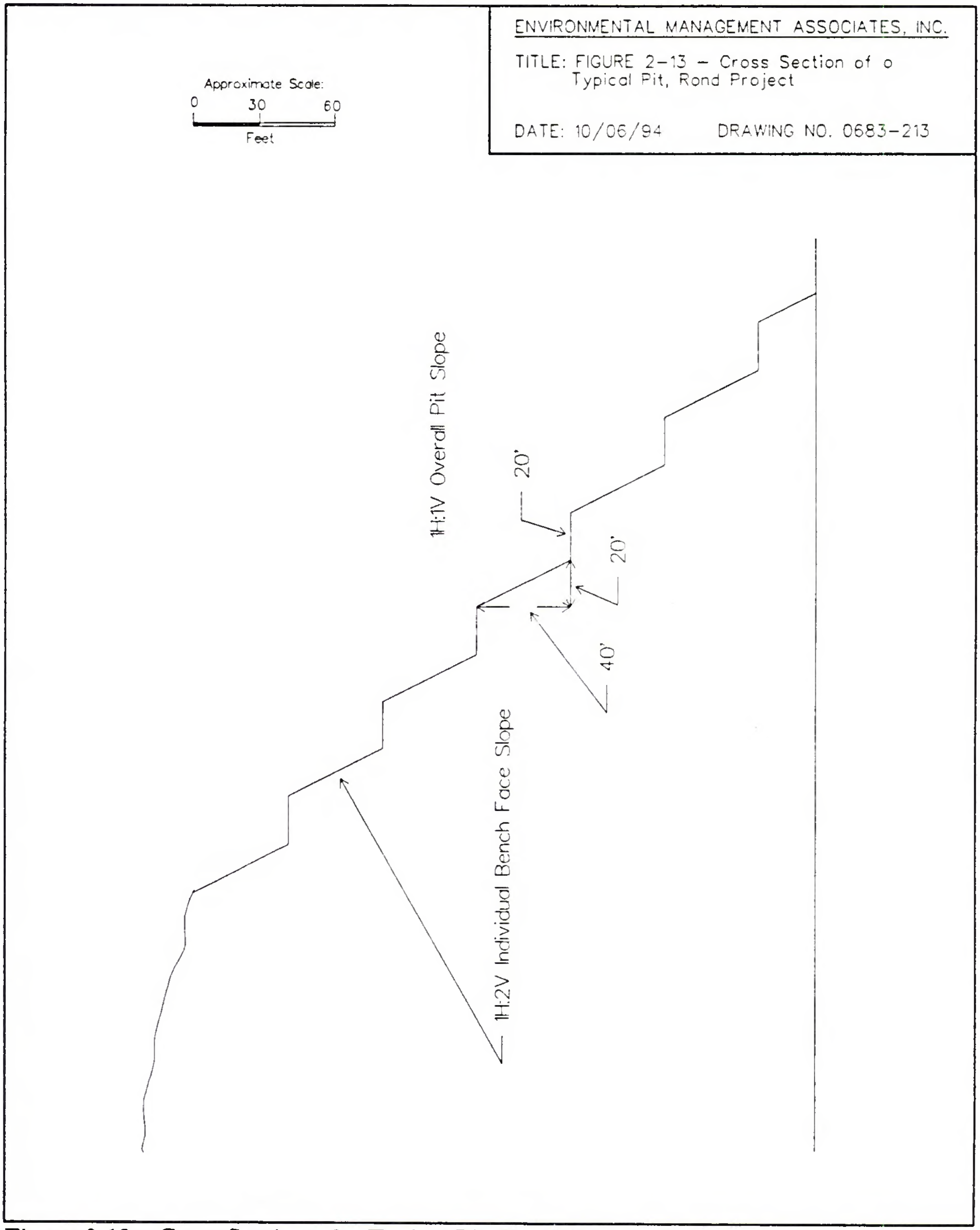


Figure 2-13: Cross Section of a Typical Pit, Rand Project

shown in Figure 2-13. A berm or 3-strand barbed wire fence would be constructed across the haul roads to prevent vehicle access to the pits. Access to all other portions of the open pits would also be limited by a 3-strand barbed wire and tortoise exclusion fence, which would be constructed during the initial phases of the operations and would be sufficient to protect the public, as well as livestock and wildlife. Signs would be posted on the fence around the pits, and any other locations which could pose a threat to public safety, as required by regulation.

The pits, including the currently permitted and extension portions, would encompass 328 acres in final configuration. Because groundwater has not been encountered in drilling to depths of greater than 500 feet in the areas within and surrounding the open pits, no infiltration of groundwater into the open pits is anticipated and, therefore, no surface impoundment of water in the open pits would occur. There would, however, be temporary accumulation of water in the open pits during and immediately after precipitation events. This water would then infiltrate into the surrounding rock or evaporate to the atmosphere. As discussed in Section 2.2.3, the rock remaining in the floor and walls of the open pits would have excess neutralization potential and, therefore, the waters that would infiltrate into the rock would not likely become acidic.

Waste Rock Stockpile Areas

The waste rock storage areas would be reclaimed under the Level Two guideline. A cross section of the final configuration for a typical waste rock stockpile is shown in Figure 2-14. Upon final mine closure, the tops of the waste rock stockpiles would be crowned to prevent water pooling, ponding, and erosion. Stockpiled topsoil material would be distributed on the tops and portions of the stockpile slopes prior to seeding with the proposed seed mixtures.

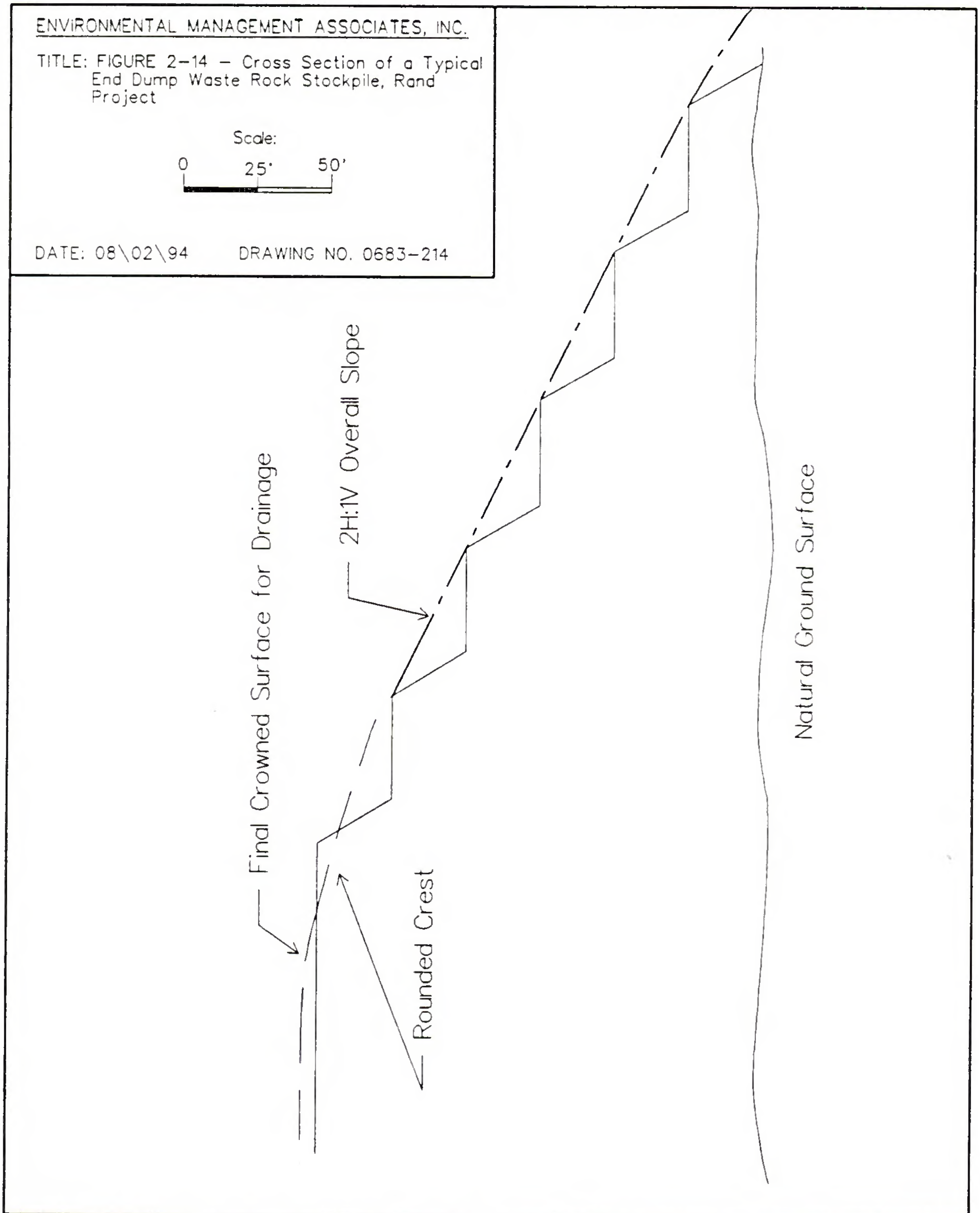


Figure 2-14: Cross Section of a Typical End-Dump Waste Rock Stockpile, Rand Project

Leach Pad Complexes

Laboratory analyses, RMC field experience and results from other existing mining operations show that the spent ore material can be neutralized by washing in place with fresh water at the end of the leach pad life. Spent ore which has been left on pads or which will be moved from a pad must first be rinsed until the following general requirements of the CRWQCB-LR have been met:

- Weak Acid Dissociable (WAD) cyanide in effluent rinse water are less than 0.2 mg/l; and
- Contaminants in any effluent from the processed ore which would result from percolating meteoric waters will not degrade surface or ground water.

If the above requirements cannot be achieved, the operator can be granted a variance, under 23 CCR Chapter 15 regulations, by the CRWQCB-LR if the operator can demonstrate that:

- The remaining solid material, when representatively sampled, does not contain levels of contaminants that are likely to become mobile and degrade the waters of the state under conditions that exist at the site; or
- The spent ore is stabilized in such a fashion as to inhibit meteoric waters from migrating through the material and transporting contaminants that have the potential to degrade water.

The ore on each heap leach pad would be neutralized, graded, and seeded in accordance with the Level Three guideline. Neutralization of the heap leach pile would be accomplished by rinsing to reduce cyanide levels to meet the requirements in the Waste Discharge Order, which must be issued by the CRWQCB-LR before use of the leach facility can commence. Sampling and laboratory testing would be conducted to evaluate the neutralization process at the conclusion of heap rinsing. After rinsing and neutralization is complete, the top of the heaps would be graded with a slight crown to reduce the amount of precipitation which would be retained on the heaps and percolate through them. The sides of the heap would be worked to a 2H:1V finished slope. Certain benches would remain. A typical cross-section of a reworked heap leach pile is shown in Figure 2-15.

Once neutralization of the heaps has been completed, which would likely require at least 12 months, all process waters and rinse solutions would be drained to the ponds for neutralization and evaporation. A neutralizing agent may be added to the process waters and rinse solutions to reduce the cyanide level to meet CRWQCB-LR standards. The waters would then be disposed of by either evaporation in place or land application. Process water ponds would then be reclaimed under the Level Three guideline. All fencing would be removed and the synthetic pond liners would be disposed of as required by the CRWQCB-LR. The pond areas would then be graded to blend with the surrounding topography. Prior to reclamation of the ponds, any solids in the ponds would be tested to determine appropriate disposal methods. Should the solids be determined hazardous through sampling, they would be removed and disposed of appropriately. The final neutralization and reclamation of the pond would not occur until the neutralization of the heaps was complete.

Access Roads

The main haul road, all other RMC links in the road network around the mine, and all remaining exploration roads would be graded, scarified, and revegetated in conformance with the Level Two guideline. As part of this reclamation plan, for those roads for which the roadbase material was placed above local grade, the roadbase material would be removed prior to site preparation for recontouring. The removed roadbase material would be deposited in a waste rock stockpile prior to grading, scarification and revegetation.

Buildings and Ancillary Facilities

Buildings and ancillary facilities would be reclaimed under the Level Three guideline. All portable and salvageable structures would be removed and

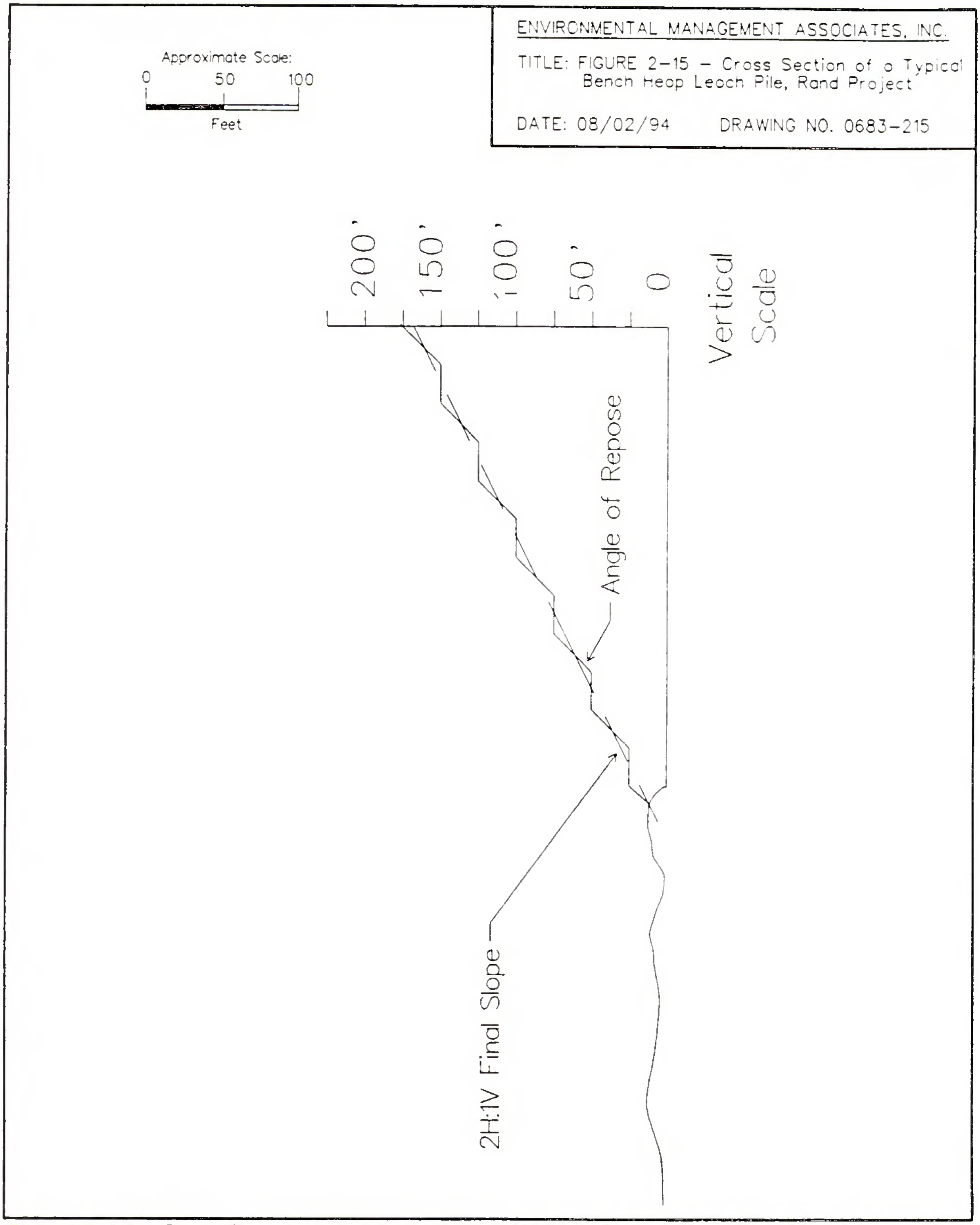


Figure 2-15: Cross Section of a Typical Bench Heap Leach Pile, Rand Project

taken off-site. Any permanent structures would be dismantled and removed off site. All building foundations would be broken up and buried under at least 1 foot of clean fill material. All surplus materials, storage containers and trash would be transported to a landfill authorized to accept this material. The remaining surplus waste products and all fuel oil and similar materials would be removed from the site and disposed of according to current state and federal regulations. Any soil material contaminated by regulated waste materials would be disposed of in accordance with state and federal requirements. The tortoise exclusion fencing constructed for the project operations would be maintained inplace until revegetation was completed and determined successful for bond release by the BLM and Kern County. At that time, the fencing would be removed.

2.3.7.5. Monitoring and Reclamation Success Evaluation

By planting in the fall or winter and utilizing the available soil moisture accumulated during winter, growth would be encouraged for most seeds in the seed mix which are spring germinators. Reclamation has a good chance for success in years with average and above-average precipitation, especially if adequate moisture is available during the April through June time period.

Following facility decommissioning, grading to desired slopes, distribution of topsoil/growth medium, and seeding, the principal components of reclamation would be completed and the bonds related to those activities should be released. However, the stability of the graded components and the resumption of pre-mining land uses would largely depend on the establishment of vegetation. Performance with quantitative determinations of revegetation success would trigger final bond release.

Revegetation monitoring would be conducted for a minimum of six (6) years following implementation of the post-closure revegetation activities, but would continue until the revegetation success, as defined in this section of the Proposed Reclamation Plan, has been achieved. At a minimum, monitoring activities would take place during the peak growth and flower time, usually April or May. Once the monitoring date is set, monitoring of the site during subsequent years would occur based on seasonal precipitation or other weather conditions.

2.3.7.5.1. Vegetation

The goal of reclamation is to establish a vegetative cover over the reclaimed area that promotes a stable physical condition and establishes site conditions that would promote the long-term development of a creosote bush scrub vegetation community typical of the local area. There are several terms used to describe the amount and type of vegetation in a given area. These terms include vegetation diversity, vegetation density, vegetation cover and vegetation species-richness. The following definitions for these terms are used in this Proposed Reclamation Plan:

Vegetative Diversity - The distribution and abundance of different plants species within a given reference area;

Vegetative Density - The number of individuals or stems of each species rooted within a given reference area.

Vegetative Cover - The vertical projection of the crown or shoot area of a species to the ground surface expressed as a percent of the total reference area; and

Vegetative Species-richness - The number of different plant species within a given reference area.

The terms vegetation density and vegetation cover provide similar measures of the amount of vegetation in a given area. The terms vegetation diversity and vegetation species-richness provide similar measures of the numbers of species within a given area.

The site conditions of low annual rainfall and variable annual conditions necessitate vegetation monitoring parameters that are not highly susceptible to annual fluctuation in climatic conditions. Given the reclamation goal and the site-specific conditions, the monitoring parameters selected by RMC are the vegetation density and vegetation diversity of the perennial herbaceous and shrub species in the project area. The intent of monitoring would not be to determine the total amount of vegetation in the reclaimed area, since the actual amount of vegetation may be greater than that identified during monitoring, depending on the time of year and the annual climatic conditions.

To establish the appropriate sample size to ensure a statistically valid sample of the vegetative population within a 80-percent confidence interval, an initial sampling of the vegetation density and vegetation diversity of the pre-existing perennial herbaceous and shrub species would be performed prior to construction. Based on the results of this initial sampling, the appropriate number of samples necessary to evaluate revegetation success during monitoring would be determined.

The specific plot size has been designed to address the site-specific conditions. Sample sites consisting of 16 meter by 16 meter plots would be established for the initial sampling and the revegetation success sampling. The actual number of sample sites that would be used during the monitoring of the revegetation activities would be determined based on the results of the initial site sampling.

Prior to construction of the leach pads and the waste rock stockpiles, at least four (4) sample sites would be determined, subject to review by the BLM and Kern County, consisting of 16 meter by 16 meter plots, which would be established in the initial sampling. Two (2) plots would be located adjacent to the proposed project facilities in areas that are anticipated to not be disturbed as a result of project activities. At least two (2) plots would be located on representative portions of the proposed leach pads and waste rock stockpiles. At each sample site, the two (2) plots would be staked and roped. Within the 16 meter by 16 meter plot the number, location and size of each species would be recorded. Each control plot would be photographed and permanently marked.

Monitoring would be conducted on a bi-annual (every two (2) years) basis. Sampling over a minimum of three (3) monitoring periods would be conducted. Results from the samplings would be analyzed to establish trends in the revegetation success. When the results of the monitoring show that there has been an establishment of 21 percent or more vegetation density and 15 percent or more vegetation diversity of the perennial shrub and herbaceous vegetation in the reclaimed and revegetated area, as compared to the initial sampling, then the revegetation effort would have been considered successful.

In the event of initial failure of the revegetation, the BLM and Kern County would be consulted regarding remediation alternatives and revegetation measures that may be undertaken.

2.3.7.5.2. Erosion

Techniques used to control the production of sediment include the overall grading design and the revegetation plan discussed above. Any storm water surface flows would be routed away from the heap leach facilities and topsoil stockpiles with diversion ditches. Additional methods to be employed, if necessary, would include berms, sediment ponds, check-dams composed of rice straw bales, sand bags, silt fences, or other temporary techniques to minimize impacts. Erosion control methods would be designed to handle a 20-year/1-hour intensity storm event, in accordance with standards established by 14 CCR 3706(d) (SMARA regulations), and deliver diverted storm waters to natural drainages at velocities that minimize erosion.

If excessive erosion and sedimentation are observed during the mining operations or exploration activities, then modifications to the erosion control methods would be made to ensure that land and surface water would not be adversely impacted.

2.3.7.5.3. Reporting

An annual report summarizing the findings of the monitoring program would be submitted to the BLM and Kern County. The report would include the acreage disturbed and reclaimed to date, and the acreage to be disturbed and reclaimed. In addition, the annual report would document the reclamation success and failures, extent of reclamation activities, and the results of the test plot activities. Information obtained during the previous years reclamation activities would be reviewed and any necessary modifications to the Proposed Reclamation Plan would be presented in the annual report for incorporation into the ongoing reclamation activities upon approval by the BLM and Kern County.

2.3.8. Financial Assurance

To establish an acceptable bonding instrument for the BLM, Kern County and the State Geologist, RMC would allocate funds to post an irrevocable letter of credit for an amount consistent with both the plan for phased construction and concurrent reclamation of the project and the reclamation cost estimates in the reclamation plan. An estimate of the cost of reclamation of the Rand Project is provided in Table 2-15. A separate financial assurance to cover the neutralization of the pads would be posted with the CRWQCB-LR to meet their separate bonding requirements. The amount of the CRWQCB-LR-held bond would be $2,063,182.50 as estimated by RMC, would be submitted prior to commencement of operations and would not be adjusted annually. Because RMC would construct the project in phases over several years, the amount of the bond would be adjusted on a yearly basis. Each year the new bond amount would reflect the amount of concurrent reclamation performed in the previous year and the amount of planned construction and operation activities in the next year. The amount of the bond would be adjusted in consultation with, and approval by, the appropriate agencies in the fourth quarter of every calendar year.

Table 2-15: Reclamation Cost Calculation Tables

COSTS FOR PHYSICAL RECLAMATION					
AREA	ACTIVITY	UNIT	UNIT COST ($)	QUANTITY	TOTAL ($)
Roads	Berms				
	D8N Bulldozer	Hour	150.00	37	5,550.00
	Scarify				
	14G Grader	Hour	125.00	11	1,375.00
	Topsoil				
	D8N Bulldozer	Hour	150.00	30	4,500.00
	621 Scraper	Hour	125.00	90	11,250.00
	Seed Set				
	D8N Bulldozer	Hour	150.00	27	4,050.00
	Seed	Lump Sum			5,880.00
	Broadcast	Lump Sum			4,200.00
Total Road Reclamation Cost					36,805.00
Waste Dump	Rip				
	D8N Bulldozer	Hour	150.00	50	7,500.00
	Topsoil				
	D8N Bulldozer	Hour	150.00	108	16,200.00
	621 Scraper	Hour	125.00	324	40,500.00
	Seed Set				
	D8N Bulldozer	Hour	150.00	100	15,000.00
	Seed	Lump Sum			17,640.00
	Broadcast	Lump Sum			12,600.00
Total Waste Dump Reclamation Cost					109,715.00
Leach Pad	Face				
	D8N Bulldozer	Hour	150.00	898	134,700.00
	Rip				
	D8N Bulldozer	Hour	150.00	3	450.00
	Topsoil				
	D8N Bulldozer	Hour	150.00	77	11,550.00
	621 Scraper	Hour	125.00	231	28,875.00
	Seed	Lump Sum			12,600.00
	Broadcast	Lump Sum			9,000.00
Total Leach Pad Reclamation Cost					197,175.00

COSTS FOR PHYSICAL RECLAMATION					
AREA	**ACTIVITY**	**UNIT**	**UNIT COST ($)**	**QUANTITY**	**TOTAL ($)**
Topsoil	Scarify 14G Grader	Hour	125.00	4	500.00
	Seed Set D8N Bulldozer	Hour	150.00	7	1,050.00
	Seed	Lump Sum			3,080.00
	Broadcast	Lump Sum			2,200.00
Total Topsoil Reclamation Cost					6,830.00
Plant Site	Concrete	Lump Sum			5,000.00
	Liner	Lump Sum			5,000.00
	Shape Berm D8N Bulldozer	Hour	150.00	19	2,850.00
	Topsoil D8N Bulldozer	Hour	150.00	7	1,050.00
	621 Scraper	Hour	125.00	21	2,625.00
	Seed Set D8N Bulldozer	Hour	150.00	10	1,500.00
	Seed	Lump Sum			1,120.00
	Broadcast	Lump Sum			800.00
Total Plant Site Reclamation Cost					19,945.00
Open Pit	Salvage Exterior Fence	No Cost			0.00
	New Fencing	Lump Sum			600.00
	Berm D8N Bulldozer	Hour	150.00	3	450.00
Total Open Pit Reclamation Cost					1,050.00
Rand Mine	Mob/Demob	Lump Sum			5,000.00
Total Mob/Demob Cost					5,000.00
Subtotal Reclamation Costs					376,245.00
Contingency at 10 percent					37,625.00
Administration at 5 percent					18,812.50
Total Reclamation Costs					432,682.50

2.3.9. Other Environmental Protection Measures

As part of RMC's proposed operations, a number of environmental protection measures beyond those discussion under reclamation, would be implemented.

In the event that cultural or paleontological resources, not previously identified, are discovered during development and reclamation activities, operations in the vicinity of the discovered resources shall cease immediately and RMC shall notify the BLM of any resources discovered on federal lands and KCPD of any resources discovered on private land. The BLM and KCPD will, as appropriate, evaluate the significance of the site and determine the need for mitigation. Rand shall not proceed with potentially disturbing activities on federal land until authorized by the BLM and on private land until authorized by KCPD.

The USFWS has recently issued the Biological Opinion for the Rand Project as part of the BLM's Federal Endangered Species Act Section 7 consultation process with the USFWS (USFWS, 1993)(Appendix K). As part of the Proposed Action to minimize impacts to listed wildlife species, RMC fully intends to comply with the terms, conditions and prescribed impact reduction measures contained in the Biological Opinion. Further, RMC would also implement the proposed specific recommendations and impact reduction measures to reduce inadvertent harm to desert tortoises and Mohave ground squirrel upon commencement of activity at the site as those identified for the Baltic Mine Project.

As part of the Proposed Action, RMC would conduct off-site reclamation activities, which would consist of the reclamation of 37 acres of historic surface disturbance in the nearby area, probably in the Rand or El Paso Mountains at site to be determined in consultation with the BLM. This reclamation would follow at least Level Two guidelines, as discussed in the Proposed Reclamation Plan portion of the Proposed Action.

Monitoring of the heap leach fields for any signs of wildlife deaths, ponding of the cyanide solution and equipment malfunction would be conducted three (3) times per day (once per shift), seven days per week. If there is any wildlife, migratory birds, threatened and endangered species, bat, or RMC-unidentified animal mortalities, assumed to be do to cyanide toxicity, then RMC would notify the BLM. Any mechanical malfunction in the emitters, pipelines or other equipment would be repaired immediately. Should any ponding of the cyanide solution on the heap leach be found, the area would be repaired by reducing the number of emitters in the area (thereby reducing solution flow), or by removal of the emitters, scarification of the heap surface under the emitters and reinstallation of the emitters.

Polypropylene mesh exclusion netting would be installed over the barren, pregnant and storm water ponds. The netting would be secured with steel cables over and under the material, and fastened to cement anchors installed into the ground. Metal chain-link fencing would also be installed at the process facilities.

The entire project area would be fenced with 3-strand barbed wire approximately 3 feet high, except a portion of BLM Route 85 which crosses the project area. The bottommost 1.5 feet of the fence would have 0.5 inch mesh hardware cloth. This mesh would be buried to a depth of 1-foot below ground level, or the bottom 1-foot would be bent at a right angle towards the outside of the fence, and covered with gravel and rocks to prevent animals from burrowing under the fence. The uppermost portion of the hardware cloth would extend not more than 2 inches above the lowermost wire strand. T-posts or other suitable anchoring posts would be placed at appropriate intervals (usually 10-16 feet spacing).

RMC would consult with the BLM as to the construction of new BLM transportation routes to mitigate the loss of routes which would result from the fencing of the project area under the Proposed Action. It is expected that RMC would incorporate loop routes, rather than spur roads, as recommended in the BLM's Rand Mountains/Fremont Valley Management Plan. Loop routes would provide variety for off-highway vehicle (OHV) recreationists, are thought to increase compliance with the route system and reduces the temptation for activities that are not consistent with the BLM management goals.

CHAPTER 3
ALTERNATIVES TO THE PROPOSED ACTION

3. ALTERNATIVES TO THE PROPOSED ACTION

This Chapter describes alternatives to the Proposed Action, including the No Action Alternative, features common to all alternatives, alternatives eliminated from detailed analysis, a description of the available resource opportunities resulting from the Proposed Action, and the Agency Preferred Alternative. Alternatives selected by the Lead Agencies for consideration in this EIS/EIR are based on potential impacts associated with the Proposed Action and issues identified through the scoping process.

Alternative designs and processes to the Proposed Action were developed through initial project scoping, consultation with other agencies and the public, and by Kern County and the BLM. These are required in the review of a proposal through the EIS/EIR process. Alternatives to be considered under NEPA and CEQA are those which could feasibly attain the Rand Project's basic objectives and are capable of either eliminating any of the significant adverse environmental effects of the Proposed Action or reducing them to a level of insignificance (even if such alternatives would be more costly or, to some degree, would impede the project's objectives). The range of alternatives is also guided by the "rule-of-reason". Alternatives are developed to satisfy an identified purpose or need, or in resolving issues presented as a result of the environmental review process. The EIS/EIR is required to explore and evaluate possible alternatives and, if an alternative is found to be infeasible or unreasonable and, thus, not considered further, the EIS/EIR must briefly explain the reasons for elimination.

The Rand Project is a proposal to extend existing operations at three (3) adjacent, approved, open-pit, heap-leach mine projects by mining additional gold and silver ore and waste rock at the current average operating rate of approximately 45,000 tons per day; continuing of the existing water use for an additional nine (9) to ten (10) years; construct facilities to process the additional ore and stockpile the additional waste rock; continue associated exploration activities; and continue implementation of wildlife impact reduction measures and reclamation activities. The purpose of RMC's Rand Project is to extend the operating life of the existing gold and silver open pit mining and heap leach operations on both public and private lands south of Randsburg, California. The objective of the Rand Project is to profitably mine ore, to process this ore to recover precious metals, and reclaim the project area.

3.1. No Action Alternative

The No Action (No Project) alternative forms the basis from which all impacts can be measured. Such action would generally not be consistent with the BLM multiple use mission and policy of making public lands available for a variety of uses, as long as these uses are conducted in an environmentally sound manner. The subject lands were not withdrawn for any special use and were open, unappropriated lands when unpatented mining claims were staked. If this alternative is implemented, activities in the project area would continue as described in Section 2.2, Previously Approved Operations. Surface disturbances that have been created by historic mining events but are proposed to be disturbed and reclaimed under the Rand Project would remain unreclaimed. Present uses in the area, which are limited predominately to mining, with grazing and recreation, would continue. The site would be available for future commercial gold processing proposals or for other proposals as permitted by BLM policy and/or County land use designations.

3.2. BLM Preferred Alternative/NEPA and CEQA Environmentally Superior Alternative

The BLM preferred alternative is the alternative which best fulfills the agency's statutory mission and responsibilities while giving consideration to economic, environmental, and technical concerns and other factors. The NEPA and CEQA environmentally superior alternative is the alternative that is determined to have the least adverse environmental effects, other than the No Action Alternative. The Proposed Action, as presented above, consists of several related components which are combined to describe the action. The preferred and environmentally superior alternative consists of the Proposed Action and the proposed mitigation measures for the Proposed Action, as modified by the mitigation measures developed by the BLM and Kern County, as discussed in Chapter 6 of the EIS/EIR. The BLM preferred alternative also contains provisions for the reclamation of previously disturbed federal lands not within the project area. RMC has agreed to include these lands as part of their proposed reclamation and environmental protection activities. This provision would result in no net loss of wildlife habitat on Federal lands under the BLM Preferred Alternative.

3.3. Alternatives Eliminated from Detailed Consideration

The EIS/EIR prepared as part of the approval process for the Baltic Mine Project analyzed a number of alternative mining and processing methods, gold processing techniques, and facility locations which were potentially applicable to the site-specific characteristics of the Baltic Mine Project area (USDI, 1992, page 2-48). These included: an underground mining alternative; an enlarged project alternative; a slower processing alternative; a faster processing alternative; a vat leaching alternative; a milling/leaching alternative; an in-situ leaching/carbon adsorption alternative; and a milling/flotation alternative. All of these alternatives were eliminated from detailed consideration in the Baltic Mine Project EIS/EIR because they were determined, for various reasons, not to be reasonable alternatives. The type and grade of the ore, type of waste rock, processing techniques, environmental setting and proposed impact reduction and reclamation techniques under the Rand Project Proposed Action are essentially identical to those under the Baltic Mine Project, as would be expected since the Baltic Mine Project area is a subset of the Rand Project area. As a result, the assessment of all these alternatives, as not being reasonable alternatives to the Proposed Action, in the Baltic EIS/EIR remains valid for this Rand Project EIS/EIR as well. Therefore, this EIS/EIR incorporates by reference the analysis of alternatives eliminated from detailed considerations in the Baltic Mine Project EIS/EIR (USDI, 1992, page 2-48 through 2-65).

However, because the scope of the Rand Project Proposed Action is slightly different than the Baltic Mine Project, three (3) alternatives analyzed in the Baltic Mine Project EIS/EIR but rejected require additional review in this EIS/EIR: the location alternative; the reduced project alternative; and the backfilling alternative.

3.3.1. Facility Location Alternatives

3.3.1.1. Alternative Heap Leach Pad Location

The proposed location of the Lamont Valley and Descarga area heap leach pads were selected by RMC after consideration of several environmental and operational factors. These factors were: proximity to the open pits;

efficiencies in the construction and operation of the heap leach facility, including a consolidated project layout; desire for gravity flow from the leach pads to the processing facility; avoidance of sensitive environmental resources; and community impacts.

Relocation of either or both of these heap leach pads from their proposed locations to other locations in the eastern or southern portion of the project area would increase the distance from the Yellow Aster open pit, which would contribute to higher costs, operational inefficiencies and increased haulage-related emissions. Locations in this portion of the project area would have higher potential to impact the desert tortoise and create a greater visibility impact because of the proximity to U.S. Highway 395 and Red Mountain. In addition, this area is the location of the "Baltic Channel" a potential auriferous placer resource (Taylor, 1993). Accordingly, there appears to be no environmental or operational advantage to be gained by relocating the leach pads to any other location within the project area.

Other alternative heap leach pad locations would be outside of the Rand Project area, to the north, east or south. All these locations would require the acquisition of additional lands and an increase in energy consumption and vehicle emission from the increase haulage distance. In addition, any locations to the north, east or south would require the construction of the facilities within desert tortoise critical habitat. Accordingly, there appears to be no environmental or operational advantage to be gained by relocating the leach pads to any location outside the project area.

3.3.1.2. Alternative Waste Rock Storage Areas

The major considerations in selecting locations for the waste rock stockpiles are: minimization of the truck haul distance and gradient from the open pit to the waste rock storage areas (and related costs); consolidation of mine facilities; adequate waste rock storage capacity; avoidance of sensitive environmental resources; and absence of economic mineral reserves or potential economic resources below the waste rock storage area.

Possible alternative locations for the waste rock storage exist both inside and outside of the project area. Disposal of the waste rock outside of the project area is undesirable because this would require the use of haul trucks outside the project area, increasing traffic and transportation costs, emissions and safety concerns, require land acquisition, and construction of the facilities would occur within desert tortoise critical habitat. Potential disposal of the waste rock at other locations within the project area, such as the area on the southeastern project boundary, were considered but eliminated because of potential impacts to the desert tortoise, which surveys indicated were likely more prevalent there than in other portions of the project area, and due to the possible location of additional economic gold reserves. This includes the area in the southeastern portion of the project area which is the location of the "Baltic Channel", a known auriferous placer resource (Taylor, 1993). Alternative locations in the Rand Project area were not considered reasonable because of the existing mining use of these areas.

3.3.1.3. Water Source Locations

RMC's planned source for the additional water necessary for the expansion associated with the Rand Project would be to increase pumpage from the existing RMC wells located in the Fremont Valley and transport the water to the project area via the existing pipeline.

Two (2) potential alternative water source locations which could be developed instead of the planned source, these being another source area in the Fremont Valley or a location in the Cuddeback Lake area, have been evaluated and rejected as reasonable alternatives.

Developing an alternative water source in the Fremont Valley would require the construction of a new well at a new location further from the existing wells, or require obtaining the use of an existing agricultural well, which generally have a capacity of 500 gpm or more, southwest of RMC's existing wells. Either scenario would require the construction of a new pipeline to transport the water to the project area. Both would result in additional activities and surface disturbance in an area of desert tortoise critical habitat, while the additional pumpage would continue to come from the Fremont Valley, the location of the existing and planned groundwater extraction. Because of the disturbance to the tortoise critical habitat and the continued production from the Fremont Valley, this alternative was not considered a potentially environmentally superior alternative and, therefore, was eliminated from further detailed consideration.

Developing an alternative water source in the Cuddeback Lake area would require the construction of a new well, or wells, or obtaining the use of an existing well or wells, to supply the additional water necessary for the expansion associated with the Rand Project. The Cuddeback Lake area is not considered a reliable source for this quantity of groundwater because of the limited production from the existing wells (Krieger and Stewart, 1978; Neste, Brudin & Stone, 1971; The Mark Group, 1987), and it is possible that the water resources may not be sufficient for the Rand Project. Use of either new or existing wells would require the construction of a new pipeline, up to 10 miles in length, to transport the water to the project area. This would result in additional activities and surface disturbance in an area of desert tortoise critical habitat. Because of the disturbance to the critical habitat and the reported limited groundwater potential, this alternative was not considered a potentially environmentally superior alternative and, therefore, was eliminated from further detailed consideration.

3.3.2. Reduced Project Alternative

Under this alternative, the total tons of ore and waste rock to be mined would be decreased from that proposed as the Proposed Action. The scale of the project would fall somewhere between the No Action Alternative (which is a continuation of the existing and previously approved mining operations) and the Proposed Action, depending on the actual amount of reduction in the project scope. The environmental consequences of these two (2) alternatives (the Proposed Action and the No Action Alternative) are addressed in Chapter 5 of this EIS/EIR.

The smallest reduced project alternative would likely be restricting the project to the expansion of existing facilities only. This would include the expansion of the Descarga heap leach pad and the expansion of the West Valley waste rock stockpile. However, since the Descarga heap leach pad expansion under the Rand Project is planned to only accommodate an additional six (6) million tons of ore, only that amount of ore, and an equally small amount of waste rock, could be removed, most likely from the Yellow Aster pit. No additional ore (or waste rock) could be removed from the Baltic or Lamont pits, as there would be no facilities to process the ore or stockpile the waste rock. Because the six (6) million tons of ore is such a small fraction (10 percent) of the 60 million tons of ore proposed to be mined under the Proposed Action, this "alternative" project is not appreciably different than the No Action Alternative, and is, thus, not considered an independently reasonable alternative.

The next smallest reduced project potentially feasible alternative would be to restrict the Rand Project to the full expansion of only one (1) of the three (3) pits, and the accompanying construction of the necessary heap leach pad and waste rock stockpile capacity. Most logically, this could be the complete mining of the Yellow Aster pit (52 acres of new surface disturbance); completion of the expansion of the West Valley waste rock stockpile (64 acres of new surface disturbance); and the construction of the necessary heap leach pad areas and processing plant in the Lamont Valley (possibly an additional 75 acres of new surface disturbance), plus some smaller additional areas for the topsoil stockpile, the haul roads, and other uses ten (10) acres). This would result in a project almost identical to the Baltic Mine Project in features, operation, size (201 acres of new surface disturbance vs. 200 acres for the Baltic Mine Project), and, because of the almost identical environmental setting, environmental impacts. This is also likely to be the smallest size expansion for the Rand Project which would be economically reasonable, given the grade of the ore.

As stated above, alternatives to be considered under NEPA and CEQA are those which could feasibly attain the Project's basic objectives and are capable of either eliminating any of the significant adverse environmental effects of the Proposed Action or reducing them to a level of insignificance. Thus, because of this potential alternative's similarities to the Baltic Mine Project, a reduced project of the size described above is probably economically reasonable. However, the Baltic Mine Project was determined to result in significant impacts to topography, water consumption and visual character of the area, and there is every reason to believe that both the Proposed Action and the reduced size project will also result in significant impacts to these resources. Since this reduced size project equivalent to the Baltic Mine Project would not likely eliminate or reduce to insignificance these probably significant impacts of the Proposed Action, and since this is the smallest sized project which is probably economically reasonable, there are no reduced size alternative projects which can be considered reasonable alternatives to the Proposed Action under NEPA or CEQA.

3.3.3. Backfilling Alternatives

The Proposed Action proposes the permanent disposal of waste rock and ore from the expanded mining operations to surface waste rock stockpiles and pads. An alternative to this permanent surface disposal would be to backfill the waste material to the open pits. This operation could reduce some of the long-term visual, biological and land use effects of the Proposed Action, however, this could also increase some of the long-term mineral resource effects. The actual mechanics of a backfilling operation is dependent on the specifics of the type of ore body, the mining method, and the physical characteristics of the area. Backfilling of a previously mined area is typically used at strip mines, where the mineral (frequently coal) exists in relatively well-defined horizontal or semi-horizontal zones or layers. Waste rock can be removed from one area and immediately deposited in an adjacent mined area which contains no residual mineral potential, thereby minimizing costly double handling of the waste material. The geometric relationship between ore and waste rock in strip mines generally favors placing overburden material into the shallow cuts of areas previously mined. Backfilling of conical, open pit mines is more constrained by the logistics of the mining operation and physical characteristics of the materials mined. For example, these open pit mines cannot be backfilled until all of the material has been mined out. However, two (2) types of backfilling methods are evaluated below as potential reasonable alternatives to the Proposed Action for the Rand Project; maximum backfilling and sequential backfilling.

3.3.3.1. Introduction

Open pits, such as the three (3) proposed for expansion under the Rand Project Proposed Action, are not generally amenable to backfilling, from both operational and economic standpoints. Surface storage of the waste rock material would first be required, increasing the area of surface disturbance. Placement of material back into the pit after completion of mining would increase operational and capital costs, increase energy consumption, and adversely affect air quality by increasing combustion and fugitive dust emissions. The increased costs of complete or partial backfilling of the material removed from a pit could render the commercial open pit mining operation economically noncommercial. However, the environmental advantages of backfilling are that it reduces the long-term visual contrast of the project and allows the pit area to be used for activities not otherwise possible without backfilling.

An additional consideration in evaluating the relative merits of backfilling is the conservation of mineral resources and energy. Complete or partial backfilling could be in conflict with objectives of federal and state mining statutes, if additional minerals could be extracted from the pit in the future. SMARA states that "...the reclamation of mined lands ... will permit the continued mining of minerals and will provide for the protection and subsequent beneficial use of the mined and reclaimed land" (Section 2711[b]). The protection of remaining mineralization at a reclaimed mine site is also incorporated into federal regulations, such that "reclamation may not be required where the retention of a stable highwall or other mine workings is needed to preserve evidence of mineralization" (43 CFR Part 3809.05[j]).

3.3.3.2. Project Constraints on Backfilling

Mineralization and Potential Reserves

The potential loss of additional mineral reserves, and the technical and economic constrains of backfilling for open pit mining, as discussed above, are applicable to the Rand Project. Maps of the three (3) Rand Project pits with cross sections showing the disseminated precious metal mineralization are shown in Figure 3-1, Figure 3-2, and Figure 3-3. The pit designs are the optimal possible based on the current geological, engineering and economic data. The configurations of the open pits are designed using a number of factors, including: grade of the mined material; precious metal recovery rates; precious metal prices; mining costs; processing costs; pit wall slope stability; and physical and legal boundary constraints. Based on systematic evaluation of these factors, the current pit designs would allow for the extraction of approximately 60 million additional tons of ore.

Gold mineralization found in the Rand Project deposits is generally disseminated, sometimes with no physical demarcation between ore and waste. In such circumstances, the mineral is mined to an economic "cut-off" grade. As shown in Figure 3-1, Figure 3-2, and Figure 3-3, precious metal mineralization extends beyond the planned limits of the pit floors and walls. The walls and floor of the pit contain gold mineralization which appears to be uneconomic to mine at the current price of gold, because of higher stripping ratio and/or lower gold grades. However, changes in external conditions, such as fluctuating metals prices and improvements in technology, can result in revised pit designs which increase the amount of economically extractable ore. If these materials left behind in the pit floor and walls are buried due to backfilling requirements, the cost of recovering them in the future may be so high that they become entirely lost as a resource (NRC, 1979). In addition to the loss of potentially recoverable ore, geologists rely on rock exposures, especially with evidence of mineralization, as a primary source of information to guide their search for additional mineralization. Backfilling would preclude or seriously hamper a geologist's ability to use the information in the pit walls in their

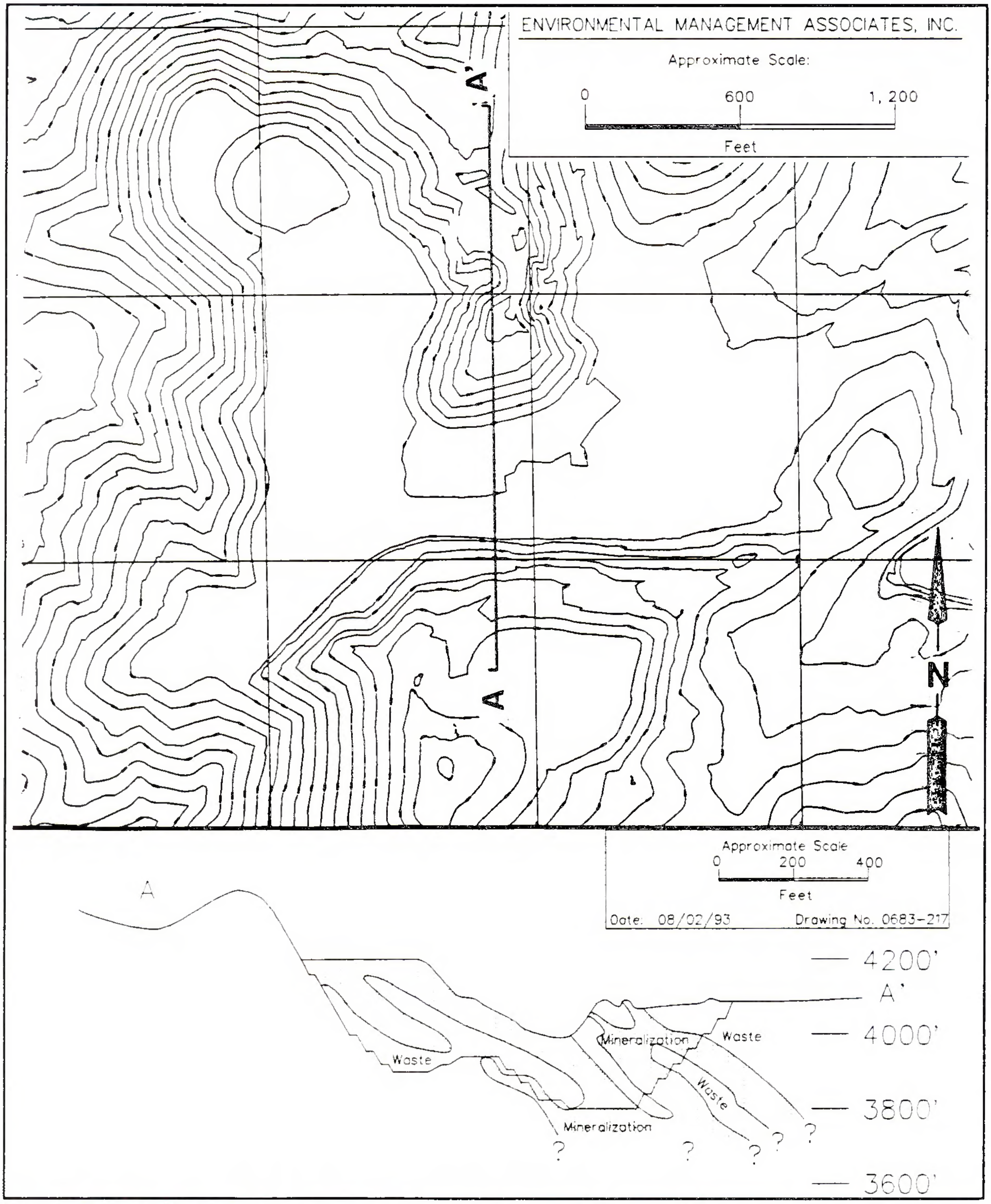


Figure 3-1: Yellow Aster Pit Design and Areas of Known Mineralization

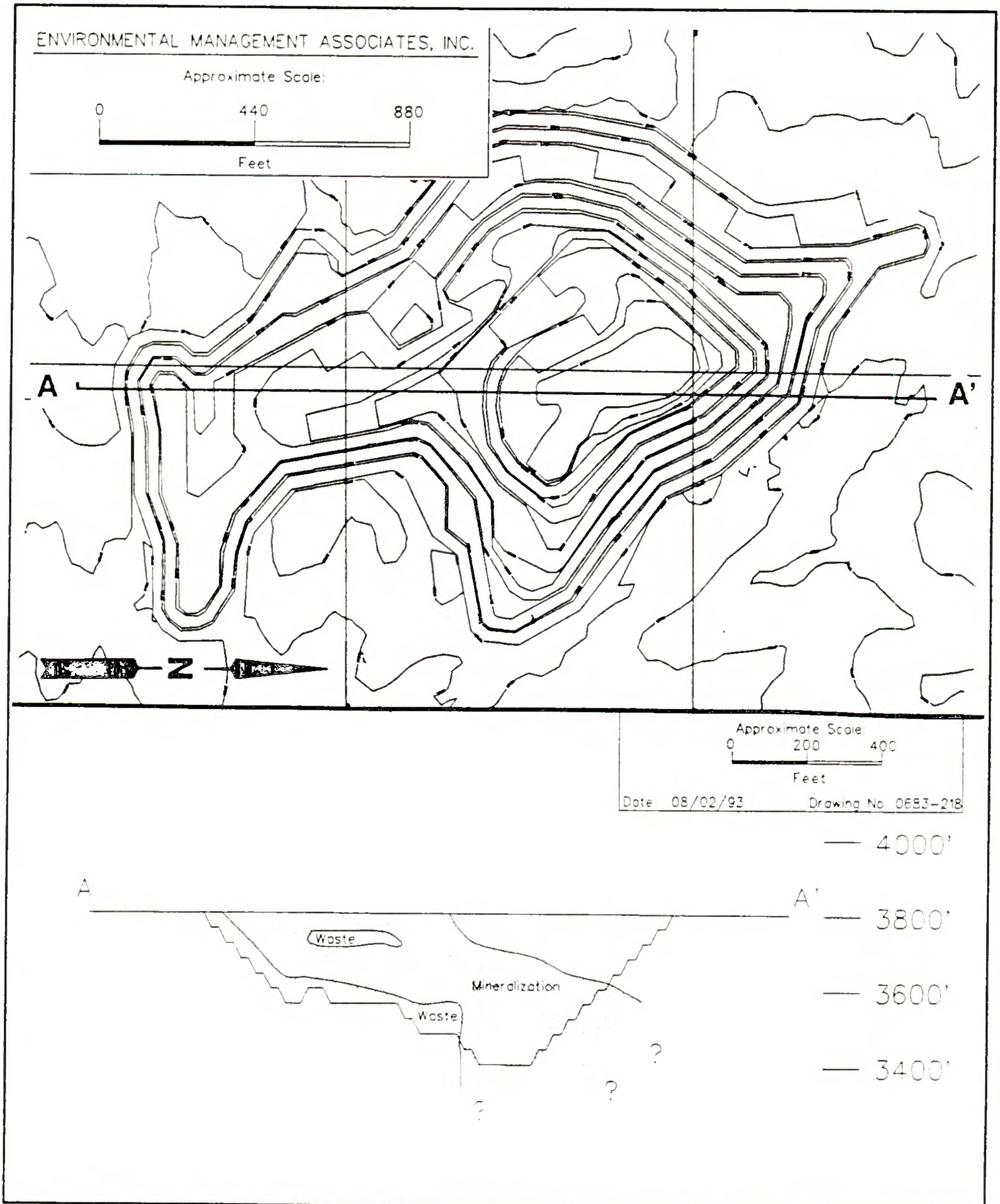


Figure 3-2: Baltic Pit Design and Areas of Known Mineralization

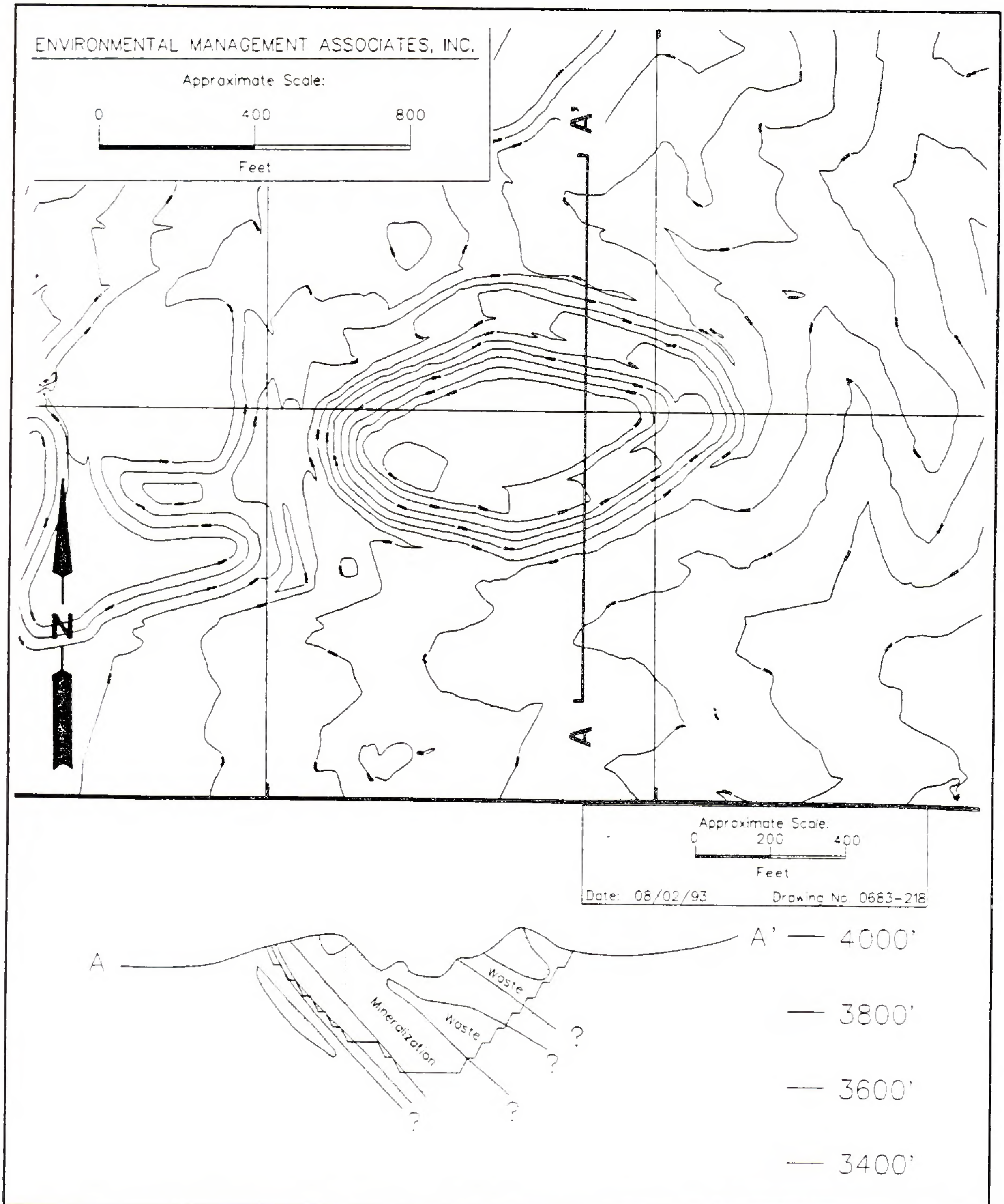


Figure 3-3: Lamont Pit Design and Areas of Known Mineralization

search for additional mineralization.

Technical Constraints of Backfilling

Once an open pit has been mined, it is generally not possible to replace all the material excavated from the pit, or to return the land surface to its original configuration, due to the physical constraints of the mined materials. Broken rock occupies a much greater volume than the same weight of solid rock. As a result of this expansion, or "swell factor", all of the rock mined from an open pit will not fit back into that pit. RMC's past experience in the Rand Project area is that the swell factor for the ore and waste in this area is approximately 30 percent. Thus, the total volume of ore and waste rock to be mined as part of the Rand Project (approximately 61 million cubic yards) would "swell" to approximately 80 million cubic yards. However, since the volume of the three (3) pits to be backfilled exceeds 80 million cubic yards (since the Rand Project only enlarges existing pits), this "swell factor" is not an issue for the Rand Project.

Economic Constraints on Backfilling

In contrast to the reclamation of strip mining operations, the cost of reclamation for most open pit metal mines greatly exceeds the value of the reclaimed land. Some of the highest reclamation costs can be generated by assuming the backfilling to original contour; on the order of $55 million to $3.2 billion for individual metal mines (NRC, 1979). Assuming a cost of $0.80 per ton (USDI, 1990a) for backfilling the mined material, the total cost for backfilling as part of the Rand Project could be in excess of $105 million. RMC has indicated that this would make the Rand Project no longer economically feasible. This conclusion is supported by an analysis for the backfilling of another open pit gold mine in California having similar characteristics, with the exception that the grade of the ore was greater than that at the Rand Project, presumably allowing the other project a greater ability to support the cost of backfilling. This analysis indicated that the project would have a negative net present value when the cost of backfilling was included (USDI, 1990a).

3.3.3.3. Maximum Pit Backfilling

This alternative would provide for the project to fill the open pits to the greatest degree possible with material mined under the Rand Project activities. This would essentially be a large earth moving project which would commence following the approximate nine (9) to ten (10) year operational period of the Rand Project. Rock that had been removed from the open pits during mining would be reloaded into trucks and returned to the pits. It is assumed that backfill material would include all the waste rock and spent ore mined as part of the Proposed Action, but not include materials mined by previously permitted operations. Assuming that the Yellow Aster, Baltic, and Lamont pits were refilled, approximately 80 million cubic yards of materials would be moved back to the pits. The backfilling project would result in the continued disturbance of approximately 500 acres as a result of continued operations at the waste rock stockpiles, open pits, and heap leach facilities. In addition, there would be continued consumption of the water, electricity and fuel, as well as continued emissions of dust and other pollutants from internal combustion engines, beyond the end of activities under the Proposed Action. Additional solid waste, such as tires, oils, filters, etc., would also be generated. However, backfilling of the pits would not likely significantly reduce the visual impact of the Rand Project area as a whole, as the pits are located in the upper reaches of the Rand Mountains and, as such, are not visible from U.S. Highway 395, the principally visual observation point for the Rand Project, and all existing waste rock stockpiles and heaps would not be reduced in this backfilling process.

Based upon these considerations, the potential loss of natural resources and economic disadvantages of maximum pit backfilling appear to be substantially greater than the potential environmental advantages. Replacement of the overburden in the mined-out pits would require several years of an economically unproductive activity and energy use, with related environmental impacts that would not otherwise occur. The economic burden of backfilling would place an unreasonable restriction on the statutory right of the federal claimant to remove mineral resources. This alternative would also promote the loss of potentially minable precious metal resources. This potential loss of mineral resources would also possibly generate a "taking" under the U.S. Constitution for the loss of a property right of the mineral claimant. As such, this alternative is judged to be not a reasonable alternative to the Proposed Action.

3.3.3.4. Sequential Pit Backfilling

This alternative would provide for the backfilling of the Rand Project open pits with waste rock during the operational life of the Proposed Action. Waste rock from one pit would be deposited in another pit that had completed mining activities. The material would be deposited in the pit using an end-dump method from the pit rim. This alternative would allow for as much material as possible to be backfilled during the operational life of the project, reduce the size of the waste rock stockpiles, and minimize impacts to wildlife habitat as much as possible. This sequential backfilling would be completed concurrent with mining operations.

If this method of backfilling were used, the Baltic open pit would likely receive waste rock from the Lamont open pit after the Baltic open pit had reached the end of economic mining. The amount of waste rock from the Lamont open pit would refill approximately 50 percent of the Baltic open pit. This amount of waste rock used to backfill the Baltic pit would proportionally reduce the height of the Lamont Valley waste rock stockpile and reduce the amount of surface disturbance in the Baltic open pit reclaimed to Level One and correspondingly increase the surface disturbance reclaimed at Level Two. The Lamont and Yellow Aster pits would likely not be backfilled.

During project operations under the sequential backfilling alternative, some waste rock stockpiles and all the heap leach piles would still be constructed as permanent surface disposal sites as they are planned under the Proposed

Action. This would result in a minor reduction of the overall visual impact of the Proposed Action. In addition, since the Baltic and Lamont open pits are located in the upper reaches of the Rand Mountains, they are not visible from U.S. Highway 395, and backfilling either or both of these pits would have very little effect in reducing the visual impacts. Based upon these considerations, it is expected that the potential loss of mineral resources are greater than potential minor visual impact advantages of this potential alternative to the Proposed Action. As such, this alternative is judged not to be a reasonable alternative to the Proposed Action.

CHAPTER 4
AFFECTED ENVIRONMENT

4. AFFECTED ENVIRONMENT

4.1. Mineral Resources

The northeastern Rand Mountains were prospected as early as the 1860s; however, it was not until 1893 that gold was actually discovered in the region in the El Paso Mountains, approximately 15 miles to the north and west of the Rand Mining District (Clark, 1970). The original Yellow Aster Mine was located in 1895 by Frederic Mooers, Charles Burcham and John Singleton and operated until approximately 1942. The location of the Yellow Aster Mine, as well as other historic mines in the area are shown on Figure 4-1. Subsequent to the start of mining operations in the Rand Mining District, the Stringer Mining District was created from the south and eastern portions of the Rand Mining District. Gold producing operations within this district included the Baltic and others (Halleran and Swope, 1987). Examination of the Baltic properties for silver followed the discovery of silver to the east, at the Kelly Mine, in 1919. The Baltic property was closed in 1925 after producing approximately 2,500 ounces of gold. The operation was idle by the 1930s, although the tailings were reworked sometime prior to 1962.

Removal of federal control over gold prices in 1972 triggered renewed interest in previously mined gold properties. The Randsburg area was investigated by various individuals and companies. In 1984 a drilling program to explore the Baltic area was implemented. Extensive exploration of the project area resulted in the delineation of a large, low-grade ore body that could be developed using open pit mining and heap leach recovery techniques. The development of an open pit mine and heap leach facility was proposed by Echo Bay Mines in 1987. The project was not fully permitted and no development activities were undertaken by Echo Bay Mines. RMC was also conducting exploration activities in this same area. RMC initiated activities in the Randsburg area in 1984 by acquiring the Yellow Aster Mine and developing a pilot test facility in the Descarga area. The Lamont Mine commenced operations in 1986, followed by the Yellow Aster Mine in 1989. RMC acquired the Baltic Mine Project in 1990 from Echo Bay Mines and proceeded with the permitting of a slightly modified version of the plan proposed by Echo Bay Mines. The Baltic Mine Project began operations in 1993. Since that time, exploration activities conducted by RMC

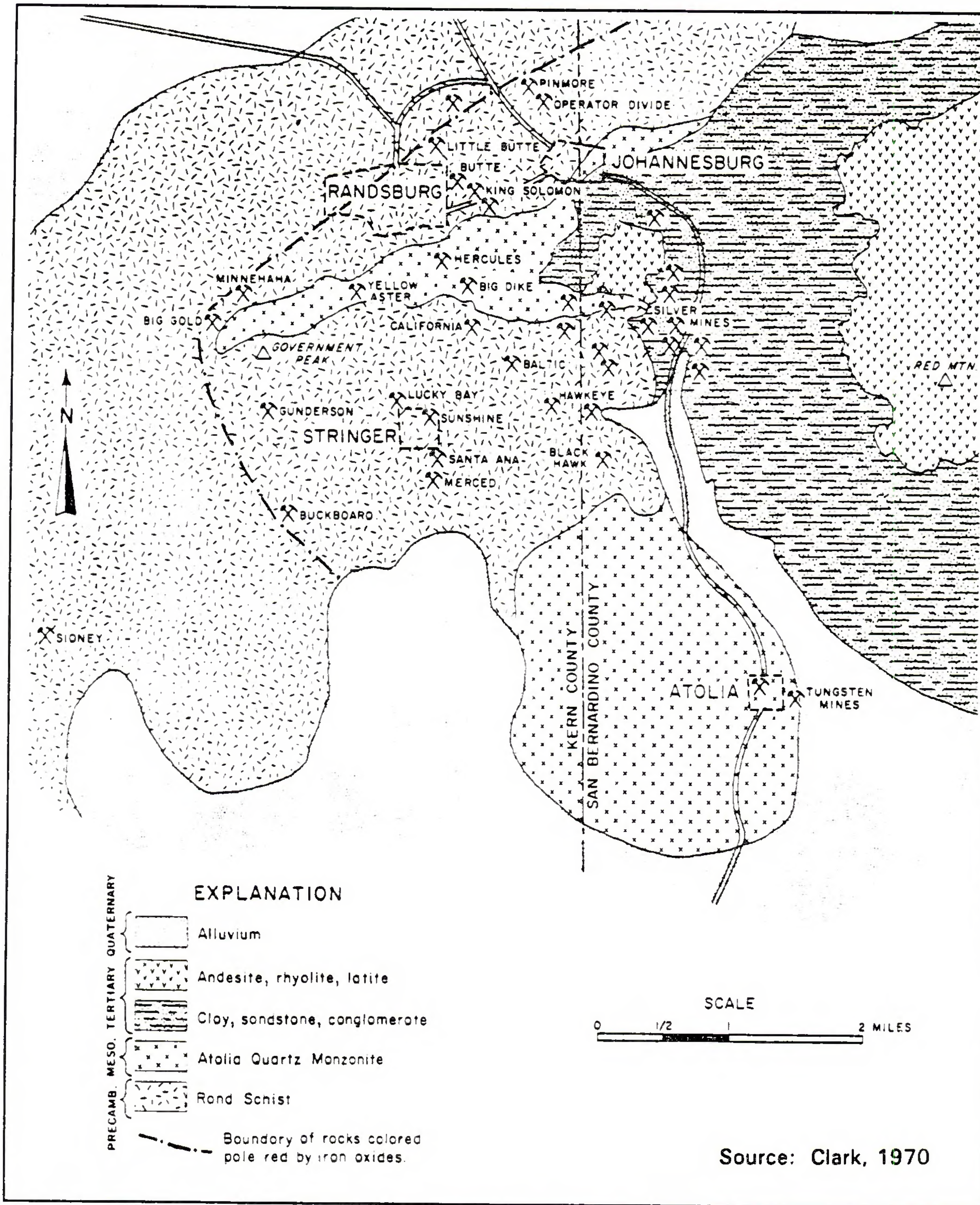


Figure 4-1: Area Geology and Historic Mine Location Map

have resulted in the delineation of additional ore reserves. These new reserves are present mostly within and adjacent to the Yellow Aster open pit area, but are also present within and adjacent to the Baltic and Lamont open pits. One (1) additional satellite orebody is also present to the west of the Lamont open pit, as shown on Figure 2-5.

4.2. Physiography and Geology

4.2.1. Physiography

The topography of the northeast portion of the Rand Mountains is rugged to rolling. Elevations range from 1,900 feet AMSL in Fremont Valley west of the project area to 4,741 feet AMSL at Government Peak on the western boundary of the project area. Topography of the project area consists of roughly east-west trending ridges with intervening valleys. The elevation of the project area varies from 3,300 feet AMSL in the northern portion of the project area to 4,741 feet AMSL at Government Peak.

Existing surface disturbance within the project area that pre-dates RMC includes the original Yellow Aster and Baltic Mines, as well as many other shafts, trenches, dumps, open stopes, adits and other facilities, which are best shown on the 1967 topographic map of the area (Figure 4-2). Approximately 761 acres of surface disturbance are associated with RMC's previously approved operations within the Rand Project area as outlined in Section 2.2.

4.2.2. Geology

The project is located in southeast California within the Mojave Desert Geomorphic Province of the Basin and Range Physiographic Province (Norris and Webb, 1976). The northeast portion of the Rand Mountains consists largely of the Atolia Quartz Monzonite of Mesozoic age and the Rand Schist of Precambrian Age (Figure 4-1) (see Appendix D for the Geologic Time Scale). These units have been intruded or covered by Tertiary age volcanic rocks of andesitic, latitic and rhyolitic composition (Clark, 1970). Subsequently, clays,


Base: USGS 7 1/2 Minute Topographic – Johannesburg, Klinker Mountain, Red Mountain and El Paso Peaks Quadrangles
ENVIRONMENTAL MANAGEMENT ASSOCIATES, INC.
TITLE: FIGURE 4-2 - Location Map of Historic Mines, Shafts and Adits in the Project Area
EXPLANATION
Project Area Boundary
Lands within the Rand Project Area not included in the Rand Project
DATE: 06/09/94
DRAWING NO.: 0683-402
Randsburg
Johannesburg
KERN CO
SAN BERNARDINO CO
Fiddlers
Gulch
Water Tank
Aqueduct
Landing Strip
Landing Strips
Substation
Water Tanks
Tailings Pond
Tailings Ponds
Trenches
Mine
Well
Radio Facility
MOJAVE ROAD
RANDSBURG
N
0
2,000
4,000
Feet

sandstones and conglomerates of the Paleocene Epoch mantled the older units at lower elevations on the east side of the project area. Quaternary alluvium has been deposited in the major valleys north and south of the project area (Figure 4-1).

The project is located in a structurally complex area. The Garlock Fault Zone is approximately six (6) miles northwest of the project area and the San Andreas Fault Zone is approximately 61 miles to the southwest (Figure 4-3). These two (2) faults have historic (<200 years) movement. Other regional faults are present in the area surrounding the project area and show movement during the Holocene Epoch (Leonoff, 1989). Geologic relationships in the mines in the Randsburg area indicate that faults which control mineralization are believed to be Tertiary in age and of a different structural orientation than the active Holocene faults. There is no evidence of post-Tertiary movement on the ore-related structures and the Holocene faults which do show active movement are located outside the boundaries of the project area.

The project area is within a county-designated seismic hazard IV area. Seismicity in the vicinity of the project area is moderate. A seismic hazard analysis of the area was prepared for the Baltic Mine Project in 1992 (Van Alstine, 1992). Table 4-4 identifies the faults on which an earthquake could potentially occur, their distance from the project area, their possible maximum magnitude and the maximum probable peak acceleration. The 100-year maximum probable earthquake which could most significantly affect the project area would be a magnitude 7.0 earthquake on the Garlock Fault, with a probable peak acceleration (ground shaking) in the project area of approximately 0.35 gravity (Van Alstine, 1992).

Monitoring for ground shaking from blasting at RMC's existing operations at the Yellow Aster and Baltic Mines are routinely conducted. A VME (Vibration Monitoring Equipment Co.) Blasting Seismograph is used to take individual measurements of particle velocities. Locations in the town of Randsburg are used to monitor the Yellow Aster blasts and locations in Red Mountain are used to monitor the Baltic blasts. The measured particle velocities never exceeded 0.1

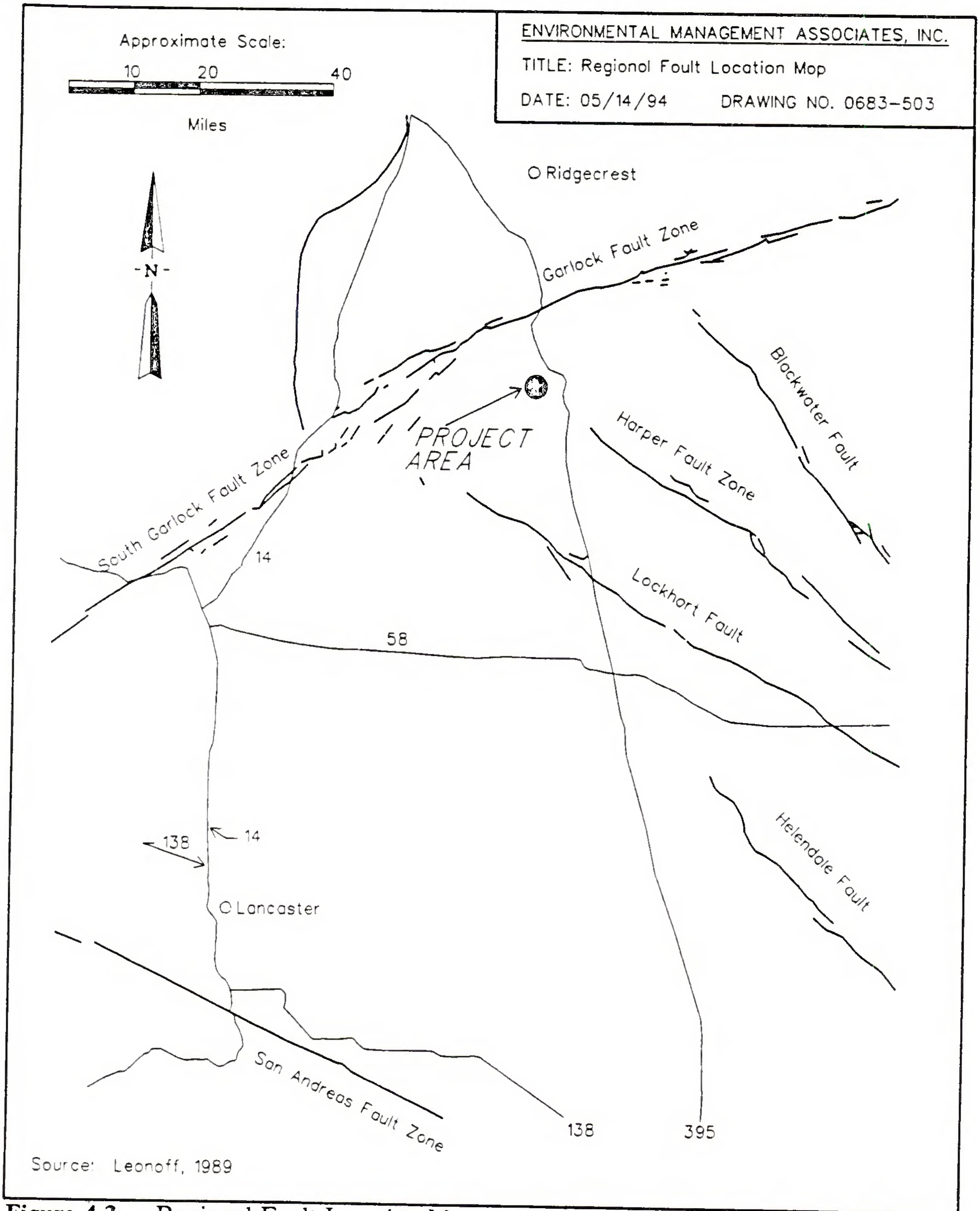


Figure 4-3: Regional Fault Location Map

inches per second (USDI, 1992).

Table 4-4: Summary of Probable Seismic Event Characteristics

FAULT	DISTANCE FROM PROJECT AREA (miles)	MAXIMUM PROBABLE EARTHQUAKE[1]	MAXIMUM PROBABLE PEAK ACCELERATION[2]
Harper	4	5.75	0.198
Garlock (east)	7	7.00	0.348
Garlock (west)	9	6.75	0.259
Lockhart	12	6.00	0.121
Blackwater	13	5.75	0.099
Sierra Nevada	22	6.50	0.096
San Andreas (Mojave)	61	8.25	0.111

Source: Van Alstine, 1992
[1] - Richter Scale as measured at the epicenter.
[2] - Measurements in gravity acceleration.

Analyses of materials at the Rand Project for naturally occurring radioactive materials (NORM) has not been conducted. However, some analyses from the general area for radon gas and uranium and thorium in soils have been conducted and can be used as an indication of the relative amount of NORM in the area. In 1990 the California Department of Health Services (DHS) conducted an initial phase survey of approximately 2,858 homes, where short-term radon detectors were placed in randomly selected homes (DHS, 1990). One sample was collected from the Randsburg area, the results of which indicated a radon isotope-222 level of 1.8 pico curies per liter (pCi/l) of air. This value is significant below the EPA recommend level of 4.0 pCi/l that which action should be taken to reduce radon level. Within approximately 15 miles of the project area approximately 70 soil samples were collected as part of the national uranium resource evaluation (NURE) (Hoffman, et al, 1991). The uranium values from these soil samples range from 0.5 to 5.5 ppm and average 1.6 ppm. The average crustal abundance of uranium is 2.5 ppm (Rose, et al, 1979). The thorium values from the same soil samples range from 2.0 to 28.0 ppm and average 7.6 ppm. The average crustal abundance of thorium is 10 ppm. In the immediate vicinity of the project area three (3) samples were collected. The uranium values from these three (3) soil samples range from 1.6 to 3.2 ppm and average 2.3 ppm. The thorium values from the three (3) soil samples range from 10.0 to 17.0 ppm and average 12.6 ppm. Using the radon value in comparison to the EPA recommended action level, and the uranium and thorium values in comparison to the average crustal abundance of those elements the project area and vicinity does not appear to have elevated levels of radioactive elements and, therefore, elevated NORM levels would not likely be expected within the project area.

4.3. Soils

A soil inventory of the 2,520-acre project area was conducted in January, 1993 (Alexander, 1993; Appendix C). The inventory identified and mapped the various soil series present in the project area, discussed the suitability of the topsoil material for reclamation activities and contained management recommendations for reclamation/revegetation activities in the area. Approximately 761 acres of surface disturbance currently exist as part of RMC's previously approved operations within the Rand Project area. From this disturbance approximately 130,000 cubic yards of topsoil have been stockpiled at various locations within the project area. The dominant soil map units identified from the mapping are generally representative of relic paleosoils which formed under moist conditions, as compared to the arid conditions of the current climate. Selected characteristics of the soil map units found are shown in Table 2-13. Approximately 50 percent of the soils in the undisturbed portion of the project area have surface horizons of between 3 and 6 inches and a total soil depth of between 10 and 20 inches, and approximately 40 percent of the soils in the undisturbed portion of the project area have surface horizons of between 6 and 9 inches and a total soil depth of between 20 and 40 inches.

4.4. Hydrology

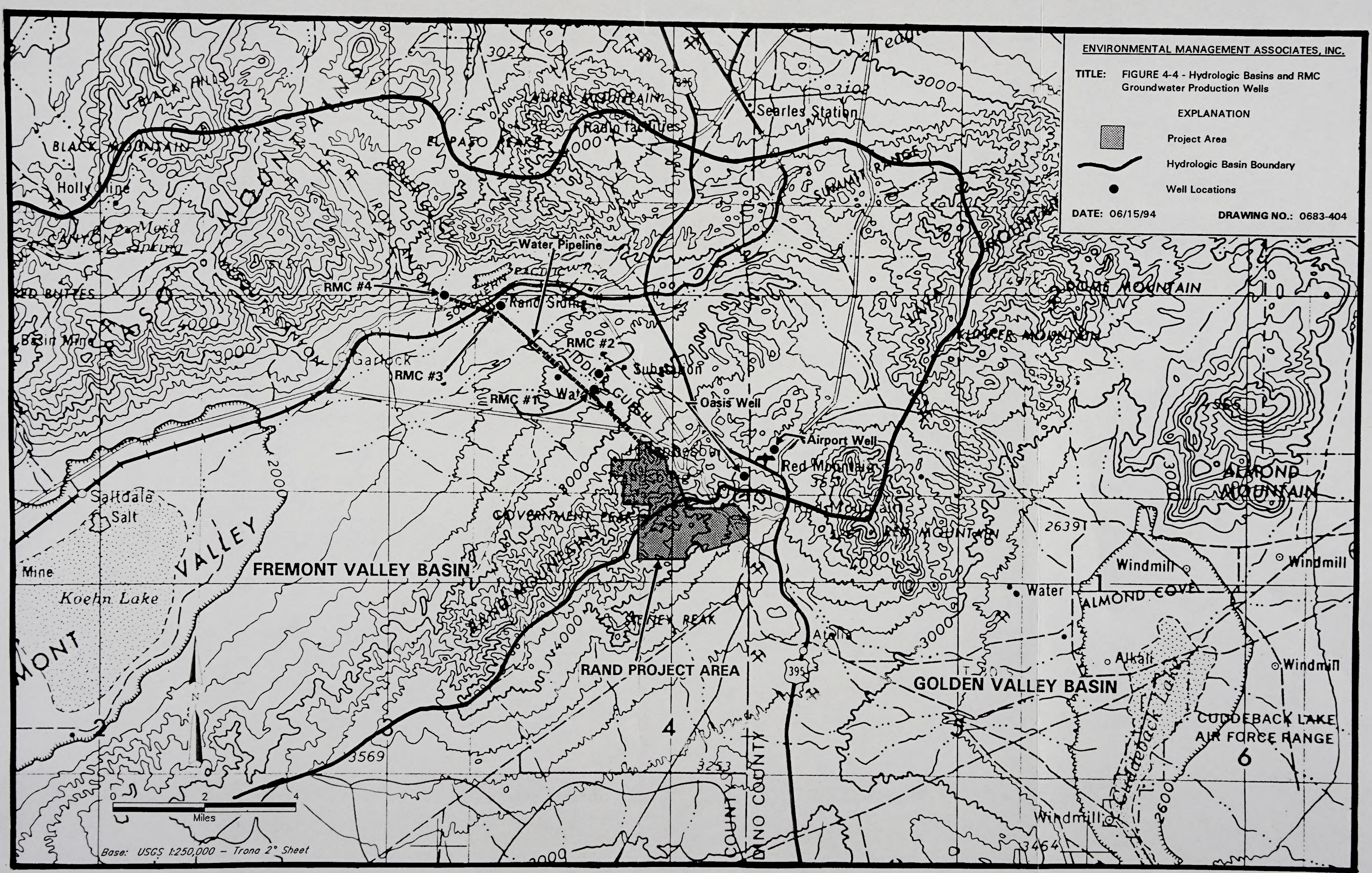
4.4.1. Surface Water

4.4.1.1. Surface Flows

Drainages in the northeastern portion of the Rand Mountains are ephemeral, with creeks and drainages mainly fed by precipitation from winter storms and summer thunderstorms. Hydrographic basin boundaries are shown on Figure 4-4. The project area is located in the Golden Valley Basin and the Fremont Valley Basin. The calculated 100-year/24-hour storm event in the area is approximately 3.5 inches of precipitation (Leonoff, 1989). Surface flows from precipitation events flow through the project area and are routed around certain process components (Figure 2-4). Within the 2,520-acre project area approximately 925 acres are currently within areas of internal drainage. These areas are the Yellow Aster, Descarga, Lamont and Baltic heap leach facilities, the Lamont and Baltic open pits and the areas up surface water gradient of the Lamont and Baltic open pits. No site-specific information on the quantity of the surface flows is available. No springs or seeps are located in the project area.

4.4.1.2. Water Quality

The surface water quality is affected by the natural conditions of the area, as well as the ongoing mining operations and development activities. A sample of surface stormwater runoff which originated from within the project area, but which was collected just southeast of the project area; had a naturally occurring background arsenic level of 0.58 parts per million (ppm) (USDI, 1992). RMC has sampled and analyzed materials mined from the ongoing operations to assess the potential for those materials to affect surface water quality. A complete discussion of the materials and sample analyses are presented in Section 2.2.3.3; however, a brief summary of the discussion follows.


ENVIRONMENTAL MANAGEMENT ASSOCIATES, INC.
TITLE: FIGURE 4-4 - Hydrologic Basins and RMC Groundwater Production Wells
EXPLANATION
Project Area
Hydrologic Basin Boundary
Well Locations
DATE: 06/15/94
DRAWING NO.: 0683-404
FREMONT VALLEY BASIN
GOLDEN VALLEY BASIN
RAND PROJECT AREA
RMC #1
RMC #2
RMC #3
RMC #4
Water Pipeline
Oasis Well
Airport Well
Searles Station
Rand Siding
Red Mountain
Koehn Lake
Saltdale
Garlock
ALMOND MOUNTAIN
ALMOND COVE
CUDDEBACK LAKE AIR FORCE RANGE
Miles
Base: USGS 1:250,000 - Trona 2° Sheet

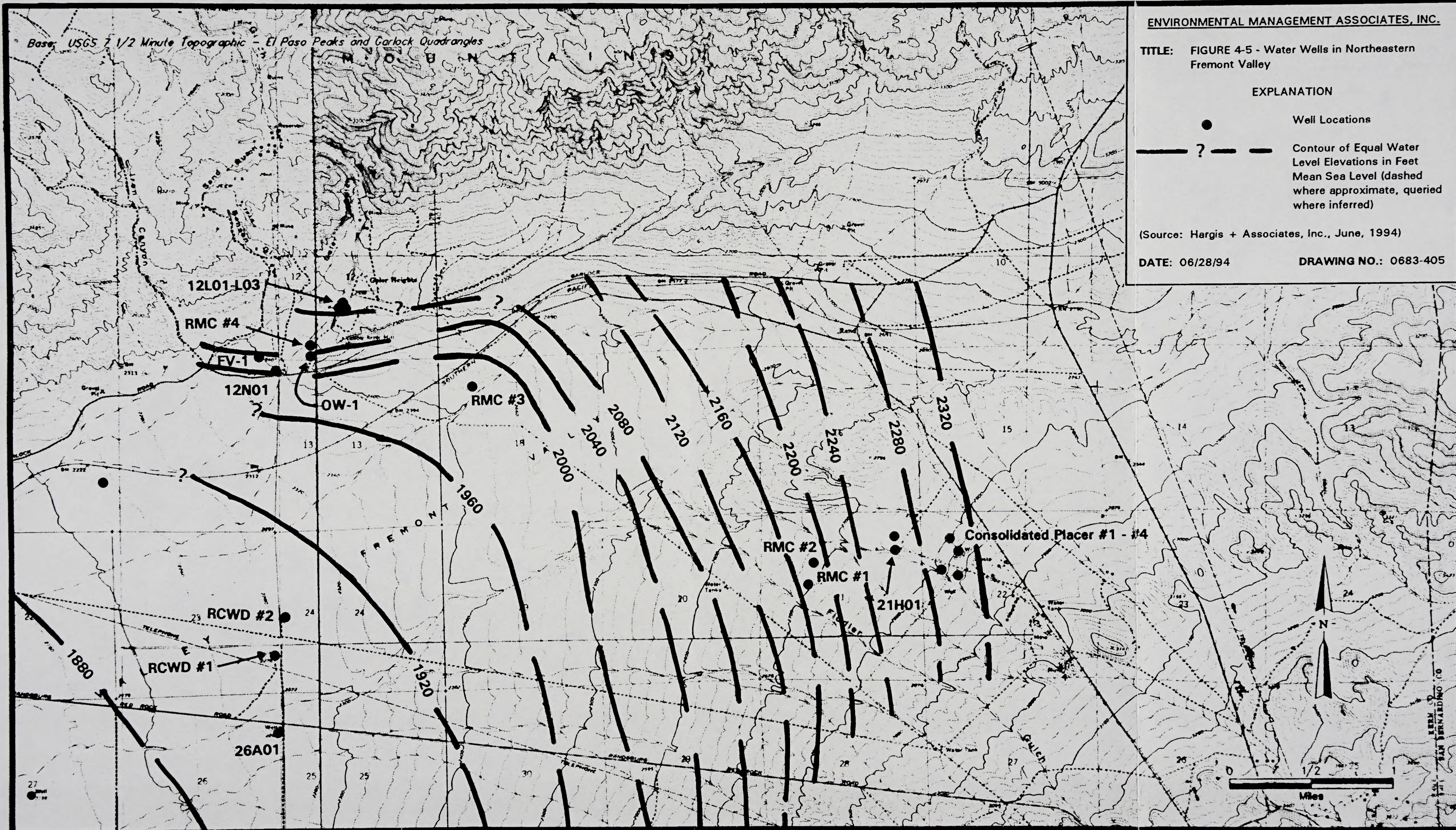
The difference between the acid potential and the neutralization potential is the net neutralization potential, which is expressed in units of tons of calcium carbonate per thousand tons of material. To assess the net neutralization potential, the material which would become waste rock was analyzed and the total sulfur content was used to determine acid generating potential. The neutralization potential was determined by direct titration. In theory, a sample could be expected to generate acidic solutions at some point in time if the net neutralization potential is less than zero. However, actual experience has shown that net neutralization potential values between -20 and 20 may be able to generate acidic solutions (SRK, et al, 1989).

All materials sampled have an excess basicity, and therefore have a low acid generating potential. The STLC-deionized water analyses of the waste rock and ore-grade materials for the Rand Project were below the STLC values. There was no significant difference between the STLC values obtained for the leached ore-grade material and the fresh ore-grade material. Therefore, the data for the fresh ore-grade material can be used as representative of the potential leachate which might be generated for the spent ore waste.

4.4.2. Groundwater

As previously stated, the project is located within the eastern portion of the Fremont Valley Basin and the northwestern portion of the Golden Valley Basin. Within the mining portion of the project area, previous mineral exploration drilling by RMC, to a depth of 500 feet, has not encountered any groundwater. This is primarily because the portion of the project area where mining and processing operations occur is a topographically uplifted area comprised of igneous and metamorphic bedrock, whereas the region's dominant groundwater resources exist in adjacent valleys which contain thick alluvial deposits.

Existing groundwater supply wells for the project are located in the northeastern portion of the Fremont Valley, northeast of Koehn Lake, northwest of the project area (Figure 4-5 and Figure 2 of Appendix E). No domestic water



ENVIRONMENTAL MANAGEMENT ASSOCIATES, INC.

TITLE: FIGURE 4-5 - Water Wells in Northeastern Fremont Valley

EXPLANATION

● Well Locations

——— ? — — Contour of Equal Water Level Elevations in Feet Mean Sea Level (dashed where approximate, queried where inferred)

(Source: Hargis + Associates, Inc., June, 1994)

DATE: 06/28/94

DRAWING NO.: 0683-405

wells are located within or adjacent to the mining and processing portion of the project area. The water wells nearest the mining and processing operations are the Oasis and Airport wells approximately 1 mile northeast of the Baltic heap leach pad (Figure 4-4). The Oasis well currently does not produce water, while the Airport well currently produces approximately ten (10) gpm for 24 hours, every two (2) weeks for irrigation purposes (Friel, 1994). All other nearby wells are located in the Fremont Valley, approximately 6 miles northwest of the mining and processing operations. Well depths and water table elevations for these wells are provided in Table 4-5.

The Fremont Valley is a 200-square mile, northeast-southwest trending, structurally-controlled valley to the west and north of the project area. The valley is bounded on the southeast by the Rand Mountains, on the northwest by the El Paso Mountains, and on the northeast by a set of low hills. The elevation of the valley floor varies from 1,900 feet AMSL at Koehn Lake to approximately 3,300 feet AMSL on the alluvial fans adjoining the bordering mountain ranges. Groundwater storage capacity in 1976 for the entire Fremont Valley was estimated at 4.8 million acre-feet, and groundwater storage above the 500-foot depth (beyond the 500-foot depth is considered uneconomical for agriculture) excluding the saline water under Koehn Lake was about two (2) million acre-feet (Guerrero, 1994). The U.S. Geological Survey (USGS) has estimated the groundwater recharge southwest of Koehn Lake at 9,500 acre-feet per year from precipitation, runoff from the surrounding mountains and underflow from the southwest (Koehler, 1977). The area lying northeast of Koehn Lake, in the northeast portion of Fremont Valley, does not receive any recharge from underflow and receives only a small quantity from stream runoff (Koehler, 1977).

Two (2) water districts produce groundwater from the Fremont Valley: the Rand Communities Water District (RCWD), from an area northeast of Koehn Lake, in the northeastern portion of the valley; and the Antelope Valley-East Kern Water Agency, producing from the southwestern portion of the valley (Figure 1 of Appendix E). The districts are separated by Koehn Lake, which is an ephemeral lake or playa. Groundwater use in Fremont Valley is predominantly from agricultural users southwest and, to a lesser degree, immediately northeast of

Koehn Lake. Water use from the aquifers northeast of Koehn Lake also includes the existing RMC wells, the RCWD wells, and other mineral development operation wells to the southeast of the RMC wells. Table 4-5 lists selected water wells in the Fremont Valley northeast of Koehn Lake, as well as available information on their construction and use (also see Figure 4-5).

Wells drilled southwest of Koehn Lake typically yield 1,500 gpm, while wells drilled northeast of Koehn Lake generally yield between 300 and 1,000 gpm (Broadbent, 1989). Measurements of the depth to groundwater during the last four (4) years in the northeastern portion of the Fremont Valley range from 240 to 560 feet below ground surface (bgs). Static water levels measured in well RMC #4 and the RCWD wells during May, 1994 ranged from approximately 325 to 375 feet bgs (Hargis + Associates, 1994). The groundwater gradient in the northeastern portion of the Fremont Valley is variable due to variation in aquifer characteristics, but in general is to the southwest at approximately 0.03 feet per foot (Hargis + Associates, 1994).

RMC currently pumps an annual average of approximately 400 gpm (605,000 gpd), from their wells for use in heap leaching and dust control at their Yellow Aster, Baltic, Lamont and Descarga facilities. During hot summer months, when water consumption is highest, production increases to an average of 580 gpm. In cool winter months, production falls to as low as 220 gpm. As water consumption would be expected to decrease beginning in fiscal year 1997, these existing RMC operations would be expected to consume an average of approximately 190 gpm for the remaining 6-year mine life. RMC's standard pumping procedure is to pump well #4, 20 hours per days, 365 days per year. This is periodically supplemented by wells #1 and #2 at approximately ten (10) gpm each and well #3 at 100 gpm.

The two (2) RCWD wells, located approximately two (2) miles south of RMC well #4, pump at approximately 100 gpm for ten (10) hours per day (60,000 gpd) (Hargis + Associates, 1994). The RCWD operates only one (1) well at a time, alternating wells on a monthly basis. The RCWD wells are completed with screened intervals from 300 to 547 feet bgs and from 450 to 590 feet bgs in wells

Table 4-5: Information on Selected Fremont Valley Water Wells

WELL NAME	DATE DRILLED	LOCATION	WELL DEPTH	PRODUCTION IN GPM	WATER TABLE DEPTH (DATE)	WATER ELEVATION
Oasis Well	1947	SW¼, SW¼, S 31 T29S, R41E	380	NP (1)[2]	267 (4/94)	NK
Airport Well	1957	NW¼, NE¼ S 31 T29S, R41E	800	14	700 (4/94)	NK
CPD-1	NK[1]	NW¼, NW¼, S 22 T29S, R40E	840	40	509 (9/93)	2311
CPD-2	NK	NW¼, NW¼, S 22 T29S, R40E	800	70	548 (9/93)	2234
CPD-3	1942	SW¼, NW¼, S 22 T29S, R40E	860	NP (94)	396 (1/42)	2444
CPD-4	1993	SW¼, NW¼, S 21 T29S, R40E	1,100	117	573 (9/93)	2227
Boral Well	NK	SE¼, NE¼, S 21 T29S, R40E	650	35	560 (10/92)	2220
RMC-1	NK	NW¼, SW¼, S 21 T29S, R40E	838	10	523 (5/94)	2161
RMC-2	1987	NW¼, SW¼, S 21 T29S, R40E	800	10	527 (5/94)	2157
RMC-3	1990	NW¼, NW¼, S 18 T29S, R40E	770	100	453 (5/94)	1970
RMC-4	1990	SW¼, SW¼, S 12 T29S, R39E	1,045	500	326 (5/94)	2095
RCWD-1	1954	SE¼, SE¼, S 23 T29S, R39E	600	100	375 (4/94)	1905
RCWD-2	1979	NW¼, SW¼, S 24 T29S, R39E	600	100	375 (4/94)	1905
28H01	NK	NE¼, SE¼, S 28 T29S, R39E	500	1000	240 (2/94)	1860
29M01	NK	NW¼, SW¼, S 29 T29S, R39E	265	800	69 (2/67)	1911
29N01	1942	SW¼, SW¼, S 29 T29S, R39E	165	350	66 (2/58)	1914
32C01	1949	NE¼, NW¼, S 32 T29S, R39E	NK	1164	79 (2/58)	1911
33H01	1956	SE¼, NE¼, S 33 T29S, R39E	460	1100	180 (8/78)	1915
3C01	1956	NW¼, NW¼, S 3 T30S, R39E	610	1600	240 (8/78)	1920

1 - NK = Not Known
2 - NP = Not Producing; number in parentheses is last known production from well.

RCWD-1 and RCWD-2, respectively. The pump for RCWD-2 is set at approximately 450 feet bgs (Hambrick, 1994). It is assumed that the pump in RCWD-1 is also set at 450 feet bgs.

As many as six (6) agricultural irrigation wells are also presently producing groundwater. As shown in Table 4-5, these wells produce an average of 5,000 gpm (7,200,000 gpd) (Hargis + Associates, 1994). The potential recharge of the agricultural irrigation is 16 percent of the total pumpage by the six (6) wells. Other wells produce lesser quantities of groundwater for mineral/industrial purposes. The well located in the NE¼ of Section 21, Township 29 South, Range 40 East, MDB&M, is intermittently used by Boral Resources for their asphalt plant; the well produces approximately 21 gpm (30,000 gpd). The four (4) wells located in the northeastern portion of the Fremont Valley in the NW¼ of Section 22, Township 29 South, Range 40 East, MDB&M are used by Consolidated Placer Dredging for their placer mining operation, which is expected to continue to operate until 1999; three (3) of the four (4) wells produce a total average of approximately 150 gpm (216,000 gpd). The potential recharge of CPD is 75 percent of the total pumpage by their three (3) wells. Therefore, CPD operations have a net potential groundwater usage of approximately 37.5 gpm. All other wells shown on Figure 4-5 have intermittent, minor production (Hargis + Associates, 1994).

Over the period 1958 to 1976, groundwater levels in the aquifers in the southwestern portion of Fremont Valley fell a maximum of 240 feet due to the large use of groundwater for agricultural activities (Koehler, 1977). The northeast part of the Fremont Valley is not utilized as extensively for agriculture, and historical water level data has showed lower rates of water table decline (Koehler, 1977). Limited data from northeastern Fremont Valley wells indicates water table declines in the vicinity of well RCWD-1 of approximately 30 feet over 30 years, or approximately 1.0 foot per year between 1953 and 1976. After 1979, well RCWD-1 continued to decline at a rate of 1.0 foot per year, while well RCWD-2 declined at a rate of 3.0 feet per year (Hargis + Associates, 1994).

Hydrologic modeling of the northeastern Fremont Valley was recently completed, and was performed to evaluate the impacts of RMC groundwater withdrawals, along with valley's additional groundwater wells, on the northeastern Fremont Valley aquifer in general, and the RCWD wells in particular (Hargis + Associates, 1994). Field investigations conducted for the modeling included water level measurements, and groundwater sample collection in June, 1993; drilling, constructing and developing a 1,007-foot deep observation well in May, 1994; and performing a 12-hour constant discharge aquifer test of RMC well #4. The modeling was performed on 6-year, 12-year and 16-year time periods using a MODFLOW numerical model. Four (4) case scenarios were deployed in the modeling: Case 1 evaluated the effects of the existing RMC groundwater production, from well RMC-4 pumping alone, and assumed RMC pumpage ceased after six (6) years and did not include regional pumpage; Case 2 evaluated the effects of the proposed Rand Project groundwater withdrawals for a 16-year period and also did not include regional pumpage; Case 3 evaluated the effects of the existing RMC-4 water well production without the increased pumpage due to the Rand Project for six (6) years, in conjunction with regional pumpage continuing for 16 years; and Case 4 evaluated the effects of the Rand Project and regional pumpage over a 16-year period. Cases 1 and 3 are described in the following paragraphs concerning the affected environment; Case 2 is described more thoroughly in the environmental consequences discussion in Chapter 5; and Case 4 is described under the cumulative impacts discussion in Chapter 9. The results of the modeling for Cases 1 and 3 are provided in Table 4-6.

Table 4-6: Results of Northern Fremont Valley Groundwater Modeling - Cases 1 and 3[1]

Model Run	Drawdown in the vicinity of RMC-4 (feet)			Drawdown in the vicinity of RCWD Wells (feet)		
	6 yr	12 yr	16 yr	6 yr	12 yr	16 yr
Case 1 - Current RMC Production	2.8	0.5	0.2	1.3	0.5	0.3
Case 3 - Current RMC production, with regional wells	21.9	35.0	41.7	23.5	38.3	44.4

[1] Hargis & Associates, Inc., June, 1994

The projected water table decline in the vicinity of the RMC well #4, based on the Case 1 existing groundwater withdrawals after six (6) years, was predicted to be 2.8 feet. The impact in the vicinity of the RCWD wells after six (6) years was predicted to be 1.3 feet; and 0.3 feet of decline from current RMC pumpage was predicted in the vicinity of the RCWD wells after 16 years. Less than 1 foot of drawdown was calculated in the vicinity of the remaining modeled wells in the northern Fremont Valley due to the existing RMC water withdrawal rates (Case 1). Modeling Case 3 indicated that, under current conditions which would have RMC ceasing groundwater production in six (6) years, drawdown in the vicinity of the RMC well #4 would be 41.7 feet after 16 years, while in the vicinity of the RCWD wells drawdown would be 44.4 feet after 16 years, due mostly to current pumpage from the valley's other existing wells. At the end of 16 years, 4.4 feet and 51.8 feet of drawdown was calculated in the vicinity of the Consolidated Placer Dredging (CPD) (projected to operate for a 5-year period to 1999) and agricultural wells respectively (Hargis + Associates, 1994).

Because the static water level is approximately 70 feet above the pumps in the RCWD wells (Hambrick, 1994), the current rate of water table decline from RMC groundwater pumpage in the northeast Fremont Valley will not likely impact the production from the wells in the short to intermediate term.

Chemical data on the quality of groundwater in the northeastern Fremont Valley is limited, but indicates that three (3) types of groundwater are present which include: a magnesium-sulfate-type water and a sodium-magnesium-sulfate-type water in the portion of the aquifer north of the Garlock fault; a sodium-sulfate-type water and a sodium-bicarbonate-type water in the central portion of the area; and, a sodium-chloride-type water and a sodium-sulfate-type water in the southwestern portion of the area (Hargis + Associates, 1994). Groundwater with high concentrations of dissolved solids is present but generally limited to shallow groundwater in the area of Koehn Lake. Measurements of dissolved solids from these waters are on the order of 50,000 to 100,000 ppm (Koehler, 1977). Better quality groundwater, with lower concentrations of dissolved solids, is present below the lower quality groundwater in the area of Koehn Lake, as well as to the northeast and southwest of Koehn Lake. Measurements of dissolved solids from these waters are on the order of 500 to 1,000 ppm (Koehler, 1977). There appear to be several aquifers, which are probably separated by impermeable clay lenses that generally separate the lower and higher quality groundwater (Koehler, 1977).

Water samples from the RMC well #4 indicate a sodium-sulfate type groundwater with 910 mg/l TDS (Hargis + Associates, 1994). Trace concentrations of iron, lead, zinc, tetrachloroethylene (PCE) and 1,1,1 trichloroethane (1,1,1,-TCA) were also detected in the sample from RMC well #4. The iron, lead and zinc are all below their respective state and federal Maximum Concentration Levels (MCLs). The PCE and 1,1,1-TCA may be associated with cleaning of the well equipment before installation (Hargis + Associates, 1994). These values were also below their respective state and federal MCLs. Water samples from RCWD well #2 indicate a sodium-bicarbonate type groundwater with a TDS of 490 mg/l, which is slightly below the MCL of 500 mg/l. All other values were also below their respective MCLs.

4.5. Air Resources

4.5.1. Meteorology

Weather data collected from 1960 to 1989 in China Lake, located approximately 25 miles north of the project area, and from 1937 to 1980 in Randsburg, are summarized in Table 4-4. The climate is characterized by hot, dry summers and mild, dry winters with local variations due to elevation and slope aspects. Temperature extremes can vary up to approximately 30° F throughout the year from the warmest average maximum temperature to the coldest average minimum daily temperature. Winters are cool with temperatures in the 50s during the day and dropping into the 30s or less at night. Summer temperatures can rise into the 100s during the day, approximately 66 days per year, and drop into the 60s at night. Because temperature is affected by elevation, the temperatures taken at China Lake generally would be higher than actual temperatures around the project area, which is approximately 1,600 feet higher than China Lake. Annual average rainfall in China Lake is 4.28 inches and in Randsburg is 5.66 inches. The maximum recorded rainfall event in China Lake was 2.18 inches.

Snowfall in the area would average approximately one (1) to two (2) days per year with an average measurable snow depth of 1 inch per occurrence. Weather information from China Lake, approximately 25 miles north of the project area, was used to describe the wind speed and direction in the project area. Based on a 30-year average for the period from 1960 to 1989, the average wind direction in China Lake is 209 degrees and the wind speed is 5.7 knots (BLM, 1992). In China Lake the strongest surface winds occur in late winter and spring as cold fronts move through the area. Strong surface winds with a prevailing speed of 15 knots or greater can be expected 15 days per year and strong gusts of 40 knots or more can be expected ten (10) days per year. Dust devils can occasionally occur due to the rapid heating of the ground surface, producing winds up to 30 knots in the vicinity of the phenomenon. However, because wind tends to increase in speed and follow mountain ranges, these speeds and directions may not be representative of the project area.

Table 4-7: Available Weather Data from Ridgecrest and Randsburg

PERIOD	AVERAGE TEMPERATURE (°F)[1]			RAIN(inches)	
	Minimum	Mean	Maximum	China Lake[1]	Randsburg[2]
January	0.0	43.3	77.0	0.71	1.08
February	9.0	49.3	88.0	0.70	1.12
March	17.0	54.7	92.0	0.59	0.72
April	28.0	61.4	102.0	0.15	0.32
May	34.0	70.5	107.0	0.12	0.08
June	40.0	79.7	115.0	0.05	0.01
July	50.0	85.6	118.0	0.23	0.10
August	50.0	84.0	113.0	0.31	0.22
September	39.0	76.2	110.0	0.25	0.26
October	21.0	64.7	103.0	0.17	0.21
November	15.0	52.0	89.0	0.50	0.56
December	2.0	43.2	86.0	0.50	0.88
Mean Annual	47.4	63.7	80.1	4.28	5.66

[1] China Lake data from BLM, 1992
[2] Randsburg data from USDI, 1992

4.5.2. Air Quality

Both ambient air quality and the emission of air pollutants are regulated under Federal and California laws and regulations. Ambient air quality standards have been established for seven (7) "criteria" pollutants. Several of these "criteria" pollutants are sometimes emitted by precious metal mining operations or created by chemical reactions in the air from pollutants emitted from precious metal mining operations. Table 4-8 lists these ambient air quality standards.

Table 4-8: Air Quality Standards and Data[a]

POLLUTANT	STANDARDS		MONITORING STATION		
	California	Federal	Trona	China Lake	Mojave
Ozone (ppm)	1 hour: 0.09	1 hour: 0.12	High: 0.08 Second High: 0.07	-	-
NO_2 (ppm)	1 hour: 0.25	-	High: 0.13 Second High: 0.10	-	-
	-	Annual Average: 0.053	0.014[b,c]	-	-
SO_2 (ppm)	1 hour: 0.25	-	High: 0.06 Second High: 0.05	-	-
	24 hour: 0.04	24-hour: 0.14	High: 0.013[c, d] Second High: 0.011[c, d]	-	-
	-	Annual Average: 0.03	0.004[b,c]	-	-
PM_{10} ($\mu g/m^3$)	24-hour: 50	24-hour: 150	High: 37.6 [d, e]	High: 22.5[d,e]	High: 25.8[d, e]
	Annual Geometric Mean: 30	-	42.0[c]	20.1[c]	25.13[c]
	-	Annual Arithmetic Mean: 50	48.5[c]	21.5[c]	28.6[c]
TSP ($\mu g/m^3$)	-	-	92.5[c, f]	25.3[c, f]	-

[a] Unless otherwise noted, data is for the fourth quarter of 1992
[c] Data is for 1989
[e] Data for Second Quarter 1993
Source: California Air Resources Board, 1989; Flynn, 1994

[b] Annual Mean - All Hours
[d] 24-hour Mean
[f] Annual Geometric Mean

The project area is located within a portion of the Southeast Desert Air Basin which is under the jurisdiction of the Kern County Air Pollution Control District (KCAPCD). This portion of the basin is designated as an "unclassified" area for PM_{10} (particulate matter less than 10 microns in size) and a non-attainment area for ozone under Federal standards (Flynn, 1994). Under California standards, the area is considered a non-attainment area for both ozone and PM_{10} (Flynn, 1994). The portion of San Bernardino County which borders the southeast portion of the project area is classified as a "moderate non-attainment area" for PM_{10} under the Federal standard and is unclassified under the State standard (De Salvio, 1994). In addition, the southern boundary of the Searles Valley Planning Area (SVPA) is located approximately 8-10 miles north of the project area (SVPA PM_{10} SIP, 1991). This area is classified as non-attainment for PM_{10} under both State and Federal standards and is classified as a "moderate non-attainment" area for ozone under the State standard. However, the air quality of the project area is generally good due to the limited population of the area, the absence of concentrated industrial activity and the lack of natural emission sources.

The nearest ongoing monitoring station for atmospheric pollutants is in Trona, California, approximately 30 miles north of the project area (California Air Resources Board, 1989). Air quality data collected from the Trona station, as well as TSP (total suspended particulates) and PM_{10} data collected from other stations, are presented in Table 4-8. As shown on Table 4-8, TSP levels in the region vary greatly. High winds and the adjacent dry lake beds in Trona may account in part for the high PM_{10} and TSP levels experienced at that monitoring station.

PM_{10} is the main pollutant of concern since high winds or increased surface disturbance can elevate PM_{10}/TSP concentrations. Principal existing sources of PM_{10}/TSP in and around the project area are vehicular traffic on unpaved roads and current and historic mining sites. No data are available regarding the existing ambient PM_{10} levels in or immediately adjacent to the project area, although emissions from both historic and current mining sites in the area are a concern of the BLM and the residents of the Randsburg area. Under contract to RMC, WZI, Inc. prepared an analysis of the estimated PM_{10} emissions and impact assessment from the existing RMC mining operations within the project area

(WZI, Inc., 1993/1994; Appendix F). Table 4-9 is a summary of the calculated maximum hourly and annual PM_{10} emissions from these operations during 1994. Since the existing RMC mining operations do not require either crushing or screening of the ore prior to placement on the heaps, all of the significant PM_{10} emissions result from fugitive sources, including drilling, blasting, loading, hauling, dozing, and wind erosion.

Table 4-9: Estimated PM_{10} Emissions From Existing RMC Mining Operations (1994)

FUGITIVE PM_{10} EMISSION SOURCE	ESTIMATED PM_{10} EMISSIONS		
	Maximum Pounds/Hour	Pounds/Year	Tons/Year
Ore Drilling (1001)	0.178	292.5	0.15
Waste Drilling (1001)	0.178	450	0.23
Ore Blasting (1002)	752	66,150	33.08
Waste Blasting (1002)	752	102,232	51.12
Truck Loading Ore (1003)	5.985	20,475	10.24
Truck Loading Waste (1003)	0.218	1,147	0.57
Hauling (1004)	2.69	20,220.1	10.11
Ore Dozing (1005)	3.81	1,601	0.80
Waste Dozing (1005)	11.55	6,933.6	3.47
Waste Wind Erosion (1006)	3.23	28,313	14.16
TOTALS	N/A	247,824.20	123.93

Hydrocarbons or reactive organic gases (ROGs) are not strictly criteria air pollutant, but are recognized as precursors of photochemical oxidants, including ozone, which is a criteria air pollutant and which is formed through atmospheric photochemical reactions. Additionally, ROGs (also known as reactive organic compounds (ROCs)) are precursors to suspended particulate matter. Oxides of nitrogen (NO_x) and oxides of sulfur (SO_x), forms of which <u>are</u> criteria pollutants, are also precursors to photochemical oxidants (ozone) and suspended particulate matter. Table 4-10 below presents a list of the known secondary pollutants caused by the emissions of ROG (ROC), NO_x, and SO_x.

Table 4-10: Secondary Pollutants from Emissions of ROG, NO_x, and SO_x

PRECURSOR	SECONDARY POLLUTANTS
Reactive Organic Compounds (ROCs)	a) photochemical oxidant (ozone)
	b) the organic fraction of suspended particulate matter
Oxides of Nitrogen (NO_x)	a) nitrogen dioxide (NO_2)
	b) the nitrate fraction of suspended particulate matter
	c) photochemical oxidant (ozone)
Oxides of Sulfur (SO_x)	a) sulfur dioxide (SO_2)
	b) sulfate (SO_4)
	c) the sulfate fraction of suspended particulate matter

SOURCE: South Coast Air Quality Management District (SCAQMD) Permit Application Training Program Manual. Page 2-1.

Principal sources of ROGs in the atmosphere include vehicular and industrial emissions and unsaturated hydrocarbon emissions from vegetation, including trees. No data are available regarding the levels of hydrocarbons in the ambient air in the project area or immediate vicinity, but they are presumed negligible due to the lack of significant emission sources, including the existing RMC projects, which have few sources of ROGs (principally vehicular and mining equipment, as well as stationary diesel engines used by water well pumps). Similarly, no data are available regarding existing levels of sulfur dioxide (SO_2) and nitrogen dioxide (NO_2) in the ambient air in the immediate project area. The levels of these pollutants are also presumed to be small because of the lack of local sources, including the existing RMC projects, which have few sources (again, principally vehicular and mining equipment, as well as the diesel engines for the water well pumps and the furnace). However, the cement plants in Mojave and Tehachapi are upwind sources of substantial NO_2 emissions.

Federal Prevention of Significant Deterioration (PSD) regulations require that the maximum allowable increase in particulate matter (TSP) in Class I airsheds (those areas provided the greatest protection from increases in ambient concentrations of air pollutants) resulting from emissions from a major stationary source is 5 $\mu g/m^3$ (annual geometric mean) and 10 $\mu g/m^3$ (24-hour maximum).

Specific types of facilities which emit, or have the potential to emit, 100 tons per year or more of PM_{10}, or any facility which emits, or has the potential to emit, 250 tons per year or more of PM_{10}, is considered a major stationary source (however, fugitive emissions are not counted as a part of emissions calculations for PSD). Since the existing RMC project emit essentially only fugitive PM_{10}, this project is not subject to the PSD regulations. Only two (2) Class I airsheds occur within 100 kilometers of the proposed project area. These include the Dome Land Wilderness, approximately 80 kilometers northwest of the project area, and Death Valley National Monument, located approximately 80 kilometers northeast of the project area.

Both Federal and California laws and regulations also regulate the emission and public notification requirements of the significance of emitted air toxics (or hazardous air pollutants), some of which are typically emitted by precious metal mining operations. California's Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB2588, California Health and Safety Code Section 44360 et seq.) requires specified facilities to submit comprehensive air toxics emission inventory plans and reports to local air pollution control districts, to be used to conduct a regional health risk assessment (HRA) of approximately 400 toxic substances identified by AB2588. In addition to requiring such an inventory, AB2588 established standards and requirements for health risk assessments and public notification of potential health risks. To provide further guidance and a standards for the preparation of individual HRAs, the California Air Pollution Control Officers Association (CAPCOA) published guidelines for the preparation of HRAs. This document was produced in consultation with the California Air Resources Board (CARB) Air Toxicology Unit and the CARB Special Projects Section, Toxic Air Contaminant Identification Section.

In compliance with AB2588, RMC had prepared and submitted to the KCAPCD estimates of the air toxic emissions from the RMC mining operations within the project area during the 1990 and 1992 calendar years. In response to supplemental requests from the KCAPCD, RMC also had prepared an HRA for the 1990 calendar year air toxic emissions following the CAPCOA Guidelines.

To provide a background level against which to compare the potential health risks from the air toxics to be emitted by the Proposed Action, WZI, Inc., under contract to RMC, prepared an assessment of the estimated air toxic emissions and an assessment of the existing potential health risk from RMC mining operations within the project area projected for calendar year 1994 (Appendix F). As with previous assessments of potential health risk, this assessment followed the CAPCOA Guidelines as well as guidance provided by the KCAPCD.

The primary source of air toxic contaminants resulting from RMC activities are fugitive dust emissions. RMC sampled waste and ore rock and road bed material from the current operation during 1993 which were analyzed by a third-party laboratory. The laboratory's analysis provided WZI, Inc. with an estimated toxic fraction of the dust emitted by RMC operations. Estimates used by WZI, Inc. as to pre-project and project emissions of dust emissions were based upon production plans provided by RMC using emission factors provided by CARB, EPA, and the KCAPCD as well as recent source tests. These emission factors produce generally conservative results, although actual dust emissions may be higher or lower then those calculated because of the uncertainty surrounding site-specific input parameters.

In the preparation of their air toxics assessment, WZI, Inc. utilized a post-processor, ACE2588, which has been widely used in California for compliance with AB2588. ACE2588's inputs include the concentrations calculated by the air dispersion model (ISC2 or equivalent), air toxic emissions by source, unit risk factors of each toxic compound, and information relating to multiple pathway effects related to health risk. The output of ACE2588 includes the concentration of each toxic compound in $\mu g/m^3$, receptor estimated total excess cancer risk, source and pollutant contributions to total cancer risk at specified receptors, receptor maximum acute exposure, and receptor maximum chronic exposure.

The multi-pathway analysis performed by WZI, Inc. was based on assumptions listed in the CAPCOA Guidelines dated January 1992. Based on the CAPCOA Guidelines, the determination of the maximum offsite cancer risk, the maximum individual offsite cancer risk at an existing receptor, and the combined inhalation and noninhalation risk are calculated for each receptor location. The inhalation risk is calculated by multiplying "ground level" concentrations of an air toxic by the air toxic-specific unit risk factor (from the CAPCOA Guidelines). The non-inhalation risk for each air toxic at a receptor location is calculated by multiplying the average daily dose by the potency slope (also included within the CAPCOA Guidelines). The average daily dose of each substance was calculated using the results of the dispersion model (ISC2) and the multipathway exposure algorithms found the CAPCOA Guidelines. The estimated risks for individual substances are then added to provide the total excess cancer risk for the receptor locations. The estimated risks for individual substances were added to provide the total excess cancer risk for the receptor locations. (CAPCOA Guidelines, p. III-33).

The CAPCOA Guidelines make it clear that there are many areas of uncertainty in making such health risk assessments, and following the guidelines will typically result in very conservative estimates (that is, the estimates of potential or actual health risk are too high), and so are best used in comparisons of relative risk. The WZI, Inc. assessment concluded that the maximum estimated excess cancer risk from emissions from the existing RMC projects at any of the population areas near the project (Randsburg, Johannesburg, Red Mountain and Dog Patch) was 0.0000029, or 2.9 additional cases of cancer per one (1) million population, at Dog Patch. The KCAPCD defines this risk level as not significant. For comparison purposes, for the general population of the United States, the risk of developing cancer is 0.333, or 333,333 cases of cancer per one (1) million population.

4.6. Vegetation and Range Resources

4.6.1. Vegetation Communities

The project area is located at elevations between 3,300 and 4,741 feet AMSL within the creosote bush scrub vegetation community (Dodge, 1993; Rado, 1993b; Brown, 1988; and McMains, 1987). The most recent vegetation study of the project is attached as Appendix G. Common perennial species in this community include creosote bush (*Larrea tridentata*), mormon tea (*Ephedra spp.*), burrobush (*Ambrosia dumosa*) and blackbush (*Coleogyne ramossisima*).

The Descarga area is dominated by creosote bush, which has been severely disturbed by historical mining operations and human habitation due to its close proximity to the town of Randsburg (Dodge, 1993). Understory shrubs are infrequent, but the Descarga plant site area contains four (4) to five (5) Joshua trees (*Yucca brevifolia*). The Baltic Mine area consists of creosote bush scrub species; a few Joshua trees are also present. The area has also been heavily disturbed from historical mining operations and OHV use (Dodge, 1993). The Yellow Aster open pit expansion area contains creosote bush, which dominates at the lower elevations, but ceases to appear above approximately 4,100 feet AMSL. Mormon tea is quite abundant in this area, and a few Joshua trees were observed at the hill summit (approximately 4,376 feet AMSL) (Dodge, 1993). Blackbush was found to be particularly abundant in this area (Brown, 1988). Large Joshua trees were observed around the Yellow Aster pit area (Gould, 1989).

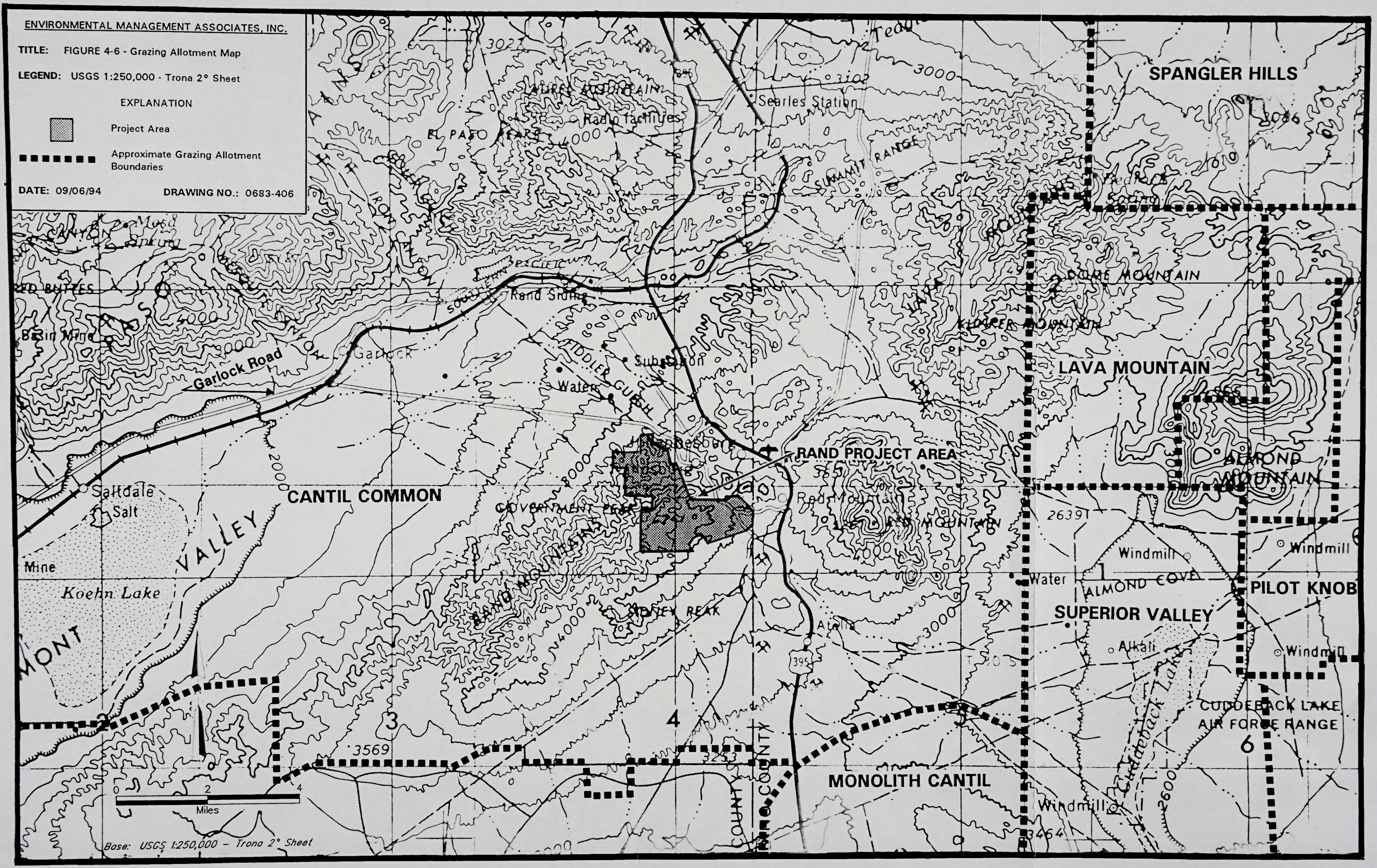
The Lamont Valley area, which includes the Lamont open pit, Lamont Valley heap leach and waste rock stockpile facilities, and the satellite open pit area, are dominated by creosote bush with an understory of blackbush, burrobush, bladder sage (*Salazaria mexicana*), and other perennial and desert shrubs (Dodge, 1993; McMains, 1987). Cholla (*Opuntia echinocarpa*) was frequently observed in the area. Numerous articulated and non-articulated Joshua trees were present. The Lamont Valley area has also been heavily disturbed by OHV use, with numerous roads and trails in the area (Dodge, 1993). The West Valley area contains creosote bush, along with burrobush and bladder sage. The steep, west-facing slope is subject to sheet erosion and consequently has poorly developed soils. Due to poorer soil quality, the vegetation found in the West Valley area is somewhat more sparse than in other portions of the Rand Project area. A few Joshua trees were observed on the hillsides and one cottontop cactus (*Echinocactus polycephalus*) with many stems was observed in the West Valley area (Dodge, 1993).

Two (2) of the vegetation surveys of the project area have identified *Eschscholzia minutiflora* (Little Gold Poppy) in several locations (Rado, 1993b; Faull, 1991). The survey conducted by Faull identified one of the subspecies, Red Rock Poppy (*Eschscholzia minutiflora twisselmannii*), which is a Category 2 federal candidate species. A Category 2 federal candidate species is one which is not protected under the Endangered Species Act, but is under review for listing pending additional information. This subspecies was identified in three (3) locations in Section 1, Township 30 South, Range 40 East, MDB&M, within the Baltic Mine area of operations (Faull, 1991). Approximately 250 plants were found in an undisturbed area of Fiddler Gulch area, approximately 500 plants were found in an undisturbed area in the extreme southeast quarter of Section 1, and approximately 26 plants were found adjacent to the east side of the Baltic Mine processing facility. The Rado survey identified the species in several locations in the eastern portion of the project area.

Because this species is extremely sensitive to precipitation, identification of this species can be difficult from year to year. The two (2) surveys which did identify the species were conducted in the spring of a very wet precipitation year. In addition, the identification of the subspecies is even more difficult and has to be made at a specific point in the germination cycle. Because of the very low amount of precipitation since the spring of 1993 only the populations of the Red Rock Poppy southeast of the Baltic Pit and the Little Gold Poppy north of the mine offices have been observed in 1994.

4.6.2. Range Resources

The project area is located entirely within the Cantil Common Allotment, which has been used for sheep grazing for approximately 130 years (Figure 4-6). Fifteen (15) permittees graze sheep in common in the allotment (USDI, 1983). Because this allotment is an ephemeral allotment, the permitted use of the allotment varies year-to-year depending on the annual forage production. The grazing capacity of land within this allotment varies depending primarily upon precipitation, and forage production can vary from less than 200 pounds per acre (lb/acre) to more than 5,000 lb/acre. Grazing in the allotment was not

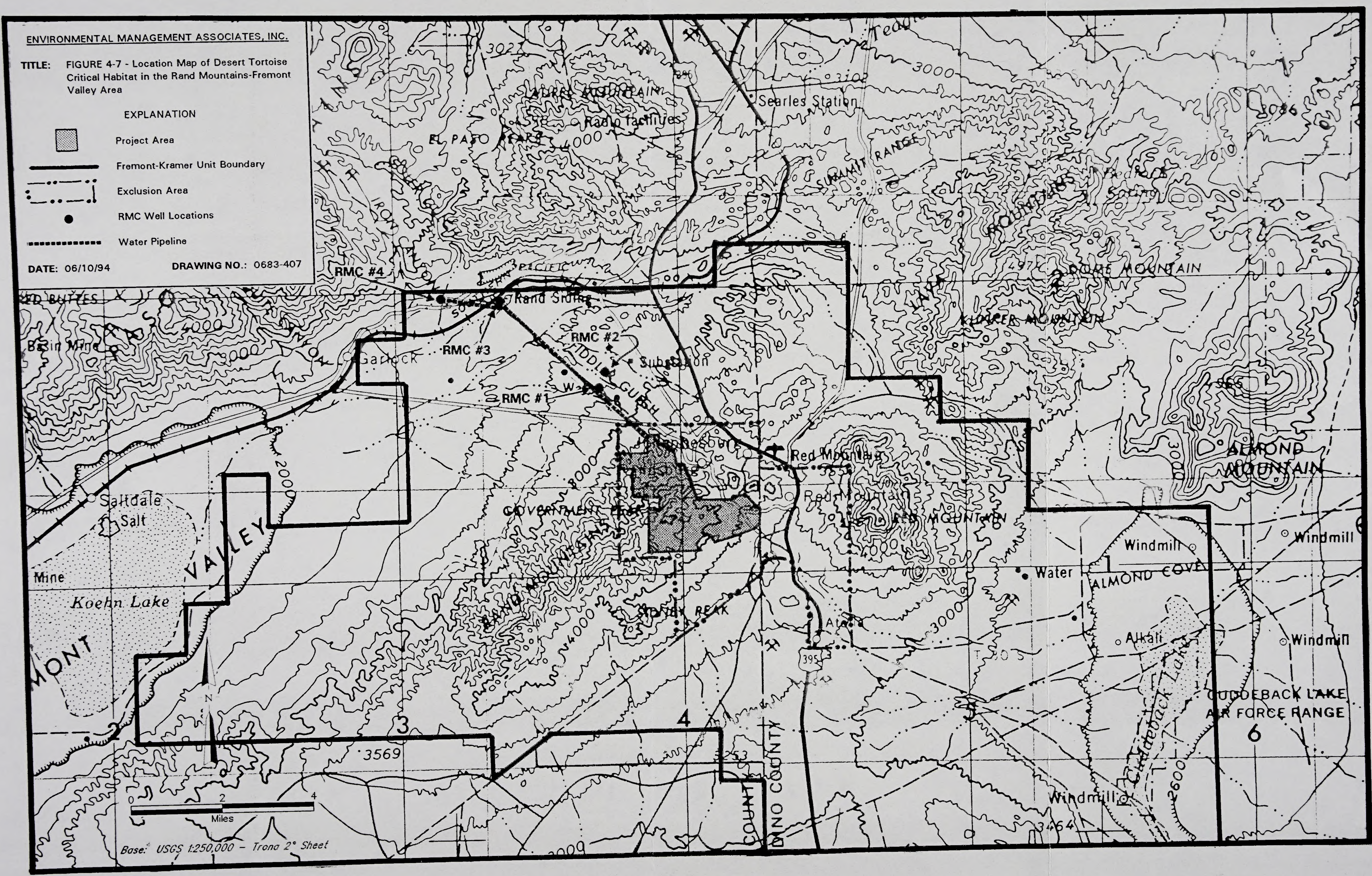

ENVIRONMENTAL MANAGEMENT ASSOCIATES, INC.
TITLE: FIGURE 4-6 - Grazing Allotment Map
LEGEND: USGS 1:250,000 - Trona 2° Sheet
EXPLANATION
Project Area
Approximate Grazing Allotment Boundaries
DATE: 09/06/94
DRAWING NO.: 0683-406
SPANGLER HILLS
Searles Station
Radio facilities
EL PASO PEAKS
SUMMIT RANGE
Rand Siding
Garlock
Garlock Road
Substation
Water
FIDDLER GULCH
LAVA MOUNTAIN
ALMOND MOUNTAIN
RAND PROJECT AREA
Red Mountain
CANTIL COMMON
Saltdale
Salt
VALLEY
Mine
Koehn Lake
MONT
GOVERNMENT PEAK
RAND MOUNTAINS
SIDNEY PEAK
Windmill
Water
ALMOND COVE
PILOT KNOB
SUPERIOR VALLEY
Alkali
CUDDEBACK LAKE AIR FORCE RANGE
Cuddeback Lake
3
4
5
6
2
3569
3253
3464
26391
395
MONOLITH CANTIL
KERN COUNTY
INYO COUNTY
0 2 4
Miles
Base: USGS 1:250,000 – Trona 2° Sheet

allowed from 1989 through 1990 and in 1994 due to below-average precipitation and, therefore, limited forage production (Sjaastad, 1994). Grazing was allowed in the allotment during 1991 through 1993; however, grazing was only allowed in that portion of the allotment north of the Garlock Road. The area south of the Garlock Road, which includes the entire project area, was excluded from grazing to protect desert tortoise habitat (Harris, 1993). In addition, the BLM is currently evaluating livestock use of the portion of the allotment within the Rand Mountains/Fremont Valley Management Area to determine what, if any, additional restrictions may be necessary on the use of the allotment for sheep grazing to protect the desert tortoise (Sjaastad, 1994). Management of this area is further discussed in Section 4.11, Land Use and Wilderness.

4.7. Wildlife Resources

A biological (botanical and wildlife) survey of the project area was conducted in spring of 1993 (Rado, 1993b) (Appendix H). This survey covered the 2,520 acre project area, including both those portions of the project area which previously had not been surveyed as well as those portions which had been previously surveyed. Information from the previous surveys was incorporated into this current survey (McMains, 1987; Brown, 1988, 1992; Gould, 1988; Rado, 1990, 1991, 1992, 1993a; and O'Farrell Biological Consulting, 1990). As discussed in Chapter 2, the Proposed Action is defined to include implementation of the reclamation plan and measures designed to reduce impacts to the desert tortoise (*Gopherus agassizii*), a federally listed threatened species that has a geographic range that encompasses the proposed project area, and the Mohave ground squirrel (*Spermophilus mohavensis*), a state-listed threatened species known to occur within this area. The USFWS has released a draft of their inventory of critical habitat for the desert tortoise, which includes the water pipeline and water well portions of the project area and the areas immediately surrounding the project area (Figure 4-7).

The entire project area consists of creosote bush scrub habitat (Rado, 1993b), and the various wildlife species which have been observed in this habitat are typical of the central Mojave Desert, including resident and migrant birds, small mammals and reptiles. A complete species list for the project area is included in Appendix H. The


ENVIRONMENTAL MANAGEMENT ASSOCIATES, INC.
TITLE: FIGURE 4-7 - Location Map of Desert Tortoise Critical Habitat in the Rand Mountains-Fremont Valley Area
EXPLANATION
Project Area
Fremont-Kramer Unit Boundary
Exclusion Area
RMC Well Locations
Water Pipeline
DATE: 06/10/94
DRAWING NO.: 0683-407
RMC #4
RMC #3
RMC #2
RMC #1
Rand Siding
Garlock
Searles Station
Radio facilities
EL PASO PEAKS
SUMMIT RANGE
Red Mountain
RED MOUNTAIN
ALMOND MOUNTAIN
GOVERNMENT PEAK
RAND MOUNTAINS
STODDARD PEAK
Saltdale
Salt
Mine
Koehn Lake
VALLEY
Windmill
Water
ALMOND COVE
Alkali
CUDDEBACK LAKE AIR FORCE RANGE
395
3569
Miles
Base: USGS 1:250,000 - Trona 2° Sheet

dominant species include desert cottontail (*Sylvilagus audubonii*), desert woodrat (*Neotoma lepida*), coyote (*Canis latrans*), western pipistrelle bat (*Pipistrellus hesperus*), black-throated sparrow (*Amphispiza bilineat*), common raven (*Corvus corax*), red-tailed hawk (*Buteo jamaicensis*), chukar (*Alectoris graeca*), horned lark (*Eremophila alpestris*), barn owl (*Tyto alba*), rockwren (*Salipinctes obsoletus*), western whiptail lizard (*Cnemidophorus tigris*), desert spiny lizard (*Sceloposus magister*), desert tortoise (*Gopherus agassizii*), long-nosed snake (*Rhinocheilus leconteii*), gopher snake (*Pituophis melanoleucus*) and sidewinder (*Crotaus cerastes*).

Observations of sensitive wildlife species include desert tortoise (*Gopherus agassizii*), Mohave ground squirrel (*Spermophilus mohavensis*), Townsend's big-eared bat (*Plecotus townsendi*), and prairie falcon (*Falco mexicanus*). The desert tortoise (*Gopherus agassizii*) is a Federal and State-listed threatened species and the Mohave ground squirrel (*Spermophilus mohavensis*) is a Federal Candidate 2 species and State-listed threatened species (Rado, 1993b). Townsend's big-eared bat, a Federal Candidate 2 species, as discussed below, has also been identified in a few locations within the project area. The Le Conte's thrasher (*Toxostoma lecontei*) was identified in the project area during a previous field investigation (McMains, 1987), but was not observed during the 1993 field study (Rado, 1993b). The Le Conte's thrasher is a CDFG Species of Concern. Other Federal and state-listed threatened or endangered species or other sensitive species not identified in the project area, but known to occur in the region, include the golden eagle (*Aquila chrysaetos*), ferruginous hawk (*Buteo regalis*), northern harrier (*Circus cyaneus*), prairie falcon (*Falco mexicanus*), burrowing owl (*Athene cunicularia*) and American badger (*Taxidea taxus*) (Rado, 1993b). All birds are considered migratory birds under the Migratory Bird Treaty Act with the exception of three (3): English sparrow (*Passer domesticus*), starlings (*Sturnus vulgaris*), and barnyard pigeons (*Columba livia*).

A survey for bats has been conducted over portions of the project area, which included the Baltic Mine area, Lamont Valley area and the West Valley area (Brown, 1993) (Appendix I). One hundred thirty (130) mine openings were surveyed either by entering or observing the entrances after dusk. Of the 97 mines entered only three (3) had guano and none had bats. Of the 15 mines observed, Townsend's big-eared bat exited from six (6) mines, small *Myotis* sp. (probably *californicus*) flew in and out of several mines, and a western pipistrelles bat was observed flying. The location of the these mines are shown on Figure 4-8 and in Appendix I. During the survey, the distinctive communication sound of pallid bats (*Antrozous pallidus*), a CDFG Species of Concern, was heard in the vicinity of the shaft in the West Valley area.

The 1993 biological assessment survey included a detailed assessment of the desert tortoise and the Mohave ground squirrel habitat within the project area (Rado, 1993b) (Appendix H). A total of 15 live desert tortoise, 22 carcasses (including disarticulated animals), nine (9) skeletal fragments, 89 burrows/pallets, and 16 scat were observed (Rado, 1993b). All observed live desert tortoise appeared to be in good health. Desert tortoise were widely distributed over the project area, but the distribution was uneven, with the highest concentration of tortoise sign and actual tortoises in the south portion of the project area, in Lamont Valley and the ridge to the south and southeast (Figure 4-8) (Rado, 1993b). The number of carcasses and skeletal fragments are disproportionately high compared to the number of live tortoise. This is probably due to avian predators bringing tortoise into the project area from low-lying areas, which is supported by the high number of carcasses observed on hilltops, ridgelines and steep slopes.

In addition to the 1993 biological assessment survey for desert tortoise, an assessment of the Mohave ground squirrel habitat within the project area was conducted (Rado, 1993a). The project area lies within the geographic range of the State-listed threatened Mohave ground squirrel. There are, however, no specific studies that provide information on the density of Mohave ground squirrel in the project area. Mohave ground squirrel have been observed in the project area, though none were observed during the 1993 studies (Rado, 1993a and 1993b). Mohave ground squirrel may potentially occur on those portions of the project that are vegetated, and assuming an average density of 15 to 20 animals per square mile, between 24 and 32 individuals may reside on the project area (Rado, 1993a).

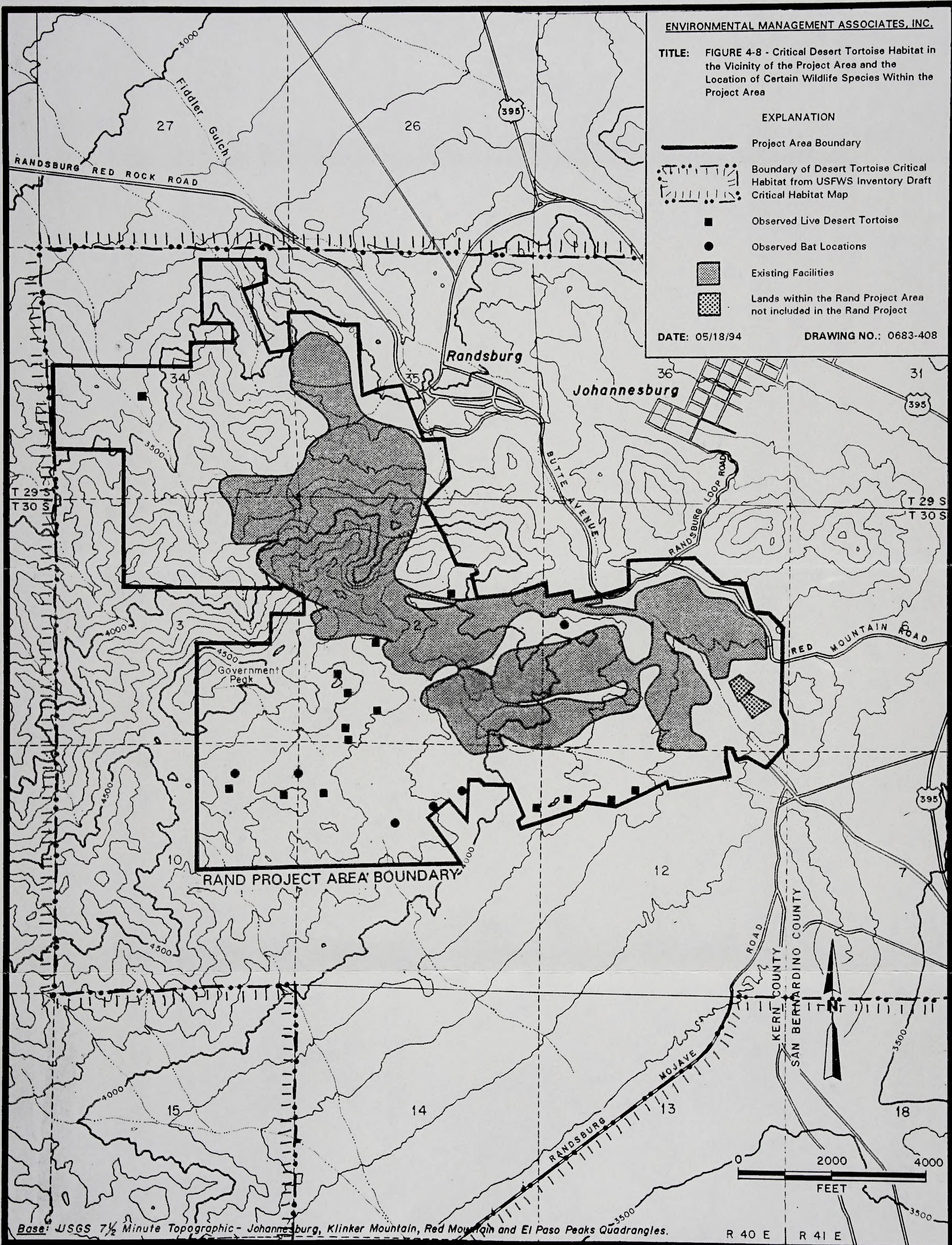
ENVIRONMENTAL MANAGEMENT ASSOCIATES, INC.

TITLE: FIGURE 4-8 - Critical Desert Tortoise Habitat in the Vicinity of the Project Area and the Location of Certain Wildlife Species Within the Project Area

EXPLANATION

- Project Area Boundary
- Boundary of Desert Tortoise Critical Habitat from USFWS Inventory Draft Critical Habitat Map
- Observed Live Desert Tortoise
- Observed Bat Locations
- Existing Facilities
- Lands within the Rand Project Area not included in the Rand Project

DATE: 05/18/94 DRAWING NO.: 0683-408



4.8. Cultural and Paleontological Resources

4.8.1. Cultural Resources

Four (4) cultural resources inventories have been conducted on both public and private land within the project area (Halleran and Swope, 1987; Pruett, et al, 1988; Yohe and Swope, 1991; Parr and Swope, 1994). These inventories documented a total of 215 historic sites, the majority of which consist of prospect holes, shafts, or adits located within the Randsburg and Stringer Mining Districts. Two (2) of these sites were destroyed through development on private lands. At the present time, 213 historic sites remain. No prehistoric sites have been found. The most recent survey (Parr and Swope, 1994) identified 212 sites, while the one (1) remaining site was identified by previous studies (Halleran and Swope, 1987; Yohe and Swope, 1991). Due to the poor condition of these sites and the limited amount of data they possess, the BLM has determined that none of these sites meet the criteria for inclusion to the National Register of Historic Places.

4.8.2. Paleontological Resources

Because of their igneous and metamorphic origin, the rock units in the northeastern portion of the Rand Mountains are not likely to contain fossils. There are no known paleontological resources within or adjacent to the project area.

4.9. Visual Resources

The visual resources of the project area were investigated for this EIS/EIR using methods outlined in Section 8400 of the BLM Manual. Using these methods, the resources are analyzed by considering the scenic quality, viewer sensitivity and the distance between the viewer and the proposed modification of the landscape. The BLM visual resource management (VRM) system, which was developed by the BLM for identifying, evaluating and classifying visual resources of public lands, assigns a management class rating from I through IV by inventorying and evaluating both scenic quality and the sensitivity of a landscape (Table 4-11). The BLM is currently managing the public lands within the project area with a VRM rating of III.

The landscape characteristics of the project area consist of a complex terrain of hills, ridges and valleys that support a creosote bush scrub vegetation community. The landscape color consists of browns, tans and grays. Vegetation colors are generally browns, greens, yellows and tans. Because of the limited vegetation cover, landscape colors meld with vegetation colors from distant view points.

Table 4-11: BLM Visual Resource Management Classes

CLASS	DESCRIPTION
I	The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
II	The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color and texture found in the predominant nature features of the characteristic landscape.
III	The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention, but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
IV	The objective of this class is to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic element.

Source: USDI, 1986

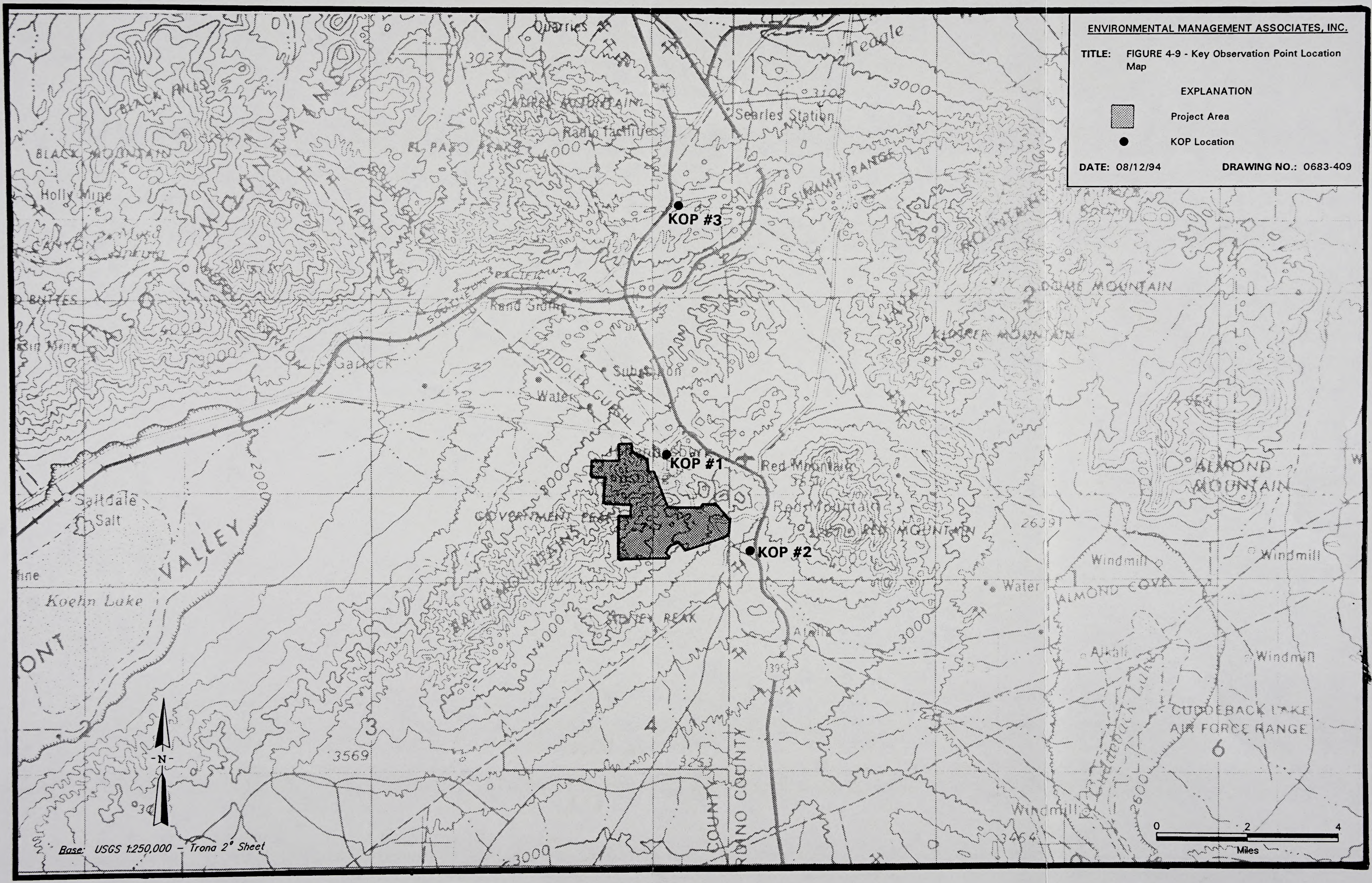
The significant majority of the visitors to the project area would be mine employees, contractors, other mine-related personnel and OHV users. Access to the actual mining operations in the Randsburg area has been limited by the company for safety and security reasons. The project area is not visible from any major travel routes or recreation areas, except for a very limited middle to background view 1 mile southeast of the project area for vehicles traveling north on U.S. Highway 395 and for a distant view for vehicles traveling south on U.S. Highway 395 in Fremont Valley.

The project area is also visible for County roads to the north and south of Randsburg, particularly for vehicles traveling south from U.S. Highway 395 into Randsburg. The project area is in the foreground to middleground for visitors on the local roads. Because mine employees and other related persons are the dominant potential viewers, and because of the limited recreational opportunities in the area to attract other viewers besides OHV users, the viewer sensitivity to the visual resources is currently considered to be low to slightly moderate.

Contrast ratings were conducted from three (3) selected viewing locations. These Key Observation Points (KOPs) were selected to represent the view from the road approaching the project area from the southeast and two (2) panoramic overviews of the project area (Figure 4-9). The visual contrast rating sheets are included in this document as Appendix J. KOP #1 was sited to represent a view of the project area when approaching from the north on the road connecting U.S. Highway 395 to Randsburg. Persons viewing the project area from KOP #1 would have a foreground view of a gently sloping surface to the south; the middleground would be composed of the historic mining town of Randsburg with evidence of historic mining activity; and from the middleground to the background would be to historic and active mining operations on the ridge south of Randsburg.

KOP #2 represents a view of the project area from U.S. Highway 395 approximately 1 mile south of Red Mountain. This site is the only point at which the project area is even partially visible from a major public road south of Red Mountain at a distance where mining-related land forms could be distinguished. The project area would be situated in the middleground and background at the low point in the mountain range. The middleground would also be dominated by the evidence of historic mining activities.

KOP #3 represents a view of the project area from U.S. Highway 395, approximately 6 miles north of the project area. From this portion of the highway individuals travelling south would have a foreground and middleground view of moderately sloping surfaces to the south, down to Fremont Valley, with the highway, railroad, other roads and a powerline creating linear features through this view. The middleground has moderately sloping surfaces increasing in elevation to the south,


ENVIRONMENTAL MANAGEMENT ASSOCIATES, INC.
TITLE: FIGURE 4-9 - Key Observation Point Location Map
EXPLANATION
Project Area
KOP Location
DATE: 08/12/94
DRAWING NO.: 0683-409
KOP #1
KOP #2
KOP #3
Searles Station
Radio facilities
Rand Siding
Garlock
Substation
Water
Red Mountain
RED MOUNTAIN
DOME MOUNTAIN
ALMOND MOUNTAIN
ALMOND COVE
Windmill
Alkali
Saltdale
Salt
VALLEY
Koehn Lake
GOVERNMENT PEAK
RAND MOUNTAINS
CUDDEBACK LAKE AIR FORCE RANGE
SUMMIT RANGE
BLACK MOUNTAIN
Holly Mine
Quarries
3000
4000
3569
N
0
2
4
Miles
Base: USGS 1:250,000 – Trona 2° Sheet

towards the town of Randsburg in the background. Beyond Randsburg to the south, in the mountains that form the skyline, mining-related land forms, which are conical in form, can be distinguished from the surrounded landscape.

Two (2) sets of photographic simulations of the project area are presented in Appendix J (Photograph J-1 through Photograph J-6). The first set of photographic simulations are for KOP #1 (Photographs J-1, J-2, and J-3), which is a view from the north, looking southwest at the waste rock stockpiles, Yellow Aster open pit and other facilities. The second set of photographic simulations are an aerial view of the project area from the northwest (Photographs J-4, J-5, and J-6). Each set of photographic simulations has three (3) photographs: one of the current conditions at the project area (Photographs J-1 and J-4); another of the project area after completion of the currently approved operations (Photographs J-2 and J-5); and the third, of the project area after the completion of the Proposed Action (Photographs J-3 and J-6).

As stated above, Photographs J-1 and J-4 (Appendix J) show the project area's current condition for reference purposes. At the completion of the currently approved operations, including reclamation (Photographs J-2 and J-5), the Yellow Aster, Lamont and Baltic open pits will have expanded. The North Waste rock stockpile will be slightly expanded. The Baltic waste rock storage area will expand and appears as a stepped mesa. The Yellow Aster heap leach will be expanded, as will the West Valley waste rock stockpile.

4.10. Noise

The project area is located in a sparsely populated rural area, with the nearest residences located approximately 500 feet east of the Descarga operations, approximately 3,000 feet southeast of the Baltic open pit at Dog Patch and approximately 3,000 feet northeast of the Yellow Aster open pit in Randsburg. The principal existing sources of noise in the area are the existing mining operations at the Yellow Aster Mine, Lamont Mine and Baltic Mine operations, sonic booms from military aircraft, vehicle traffic on nearby roads, including U.S. Highway 395, and off-highway vehicle activity. Electrical powerlines, wind and, to a lesser extent, birds and rain showers contribute to the existing ambient noise level.

The local terrain is complex, which produces areas in which the noise from the existing mining and exploration operations may be sheltered or focused.

Limited noise measurements are available for the area, and the existing noise levels are known to be elevated relative to what would normally be expected in a rural desert areas like the project area. In conjunction with the vibration monitoring conducted by RMC in the towns of Randsburg, for the Yellow Aster Mine, and Red Mountain, for the Baltic Mine, over-pressure (air vibration or shock waves) monitoring was conducted. No over-pressure was observed in Randsburg or Red Mountain due to blasting.

Current RMC mining operations result in identifiable noise patterns, which include engine noise and back-up alarms from haul trucks, engine noise from loaders and other vehicles, blasting, and miscellaneous equipment noise from the process plants, shop and offices. The haul truck engine noise is generally generated during the traveling from the open pits to the waste rock stockpiles and heap leach pads and back to the open pits. The haul truck back-up alarm noise is generally generated at the open pits, waste rock stockpiles and heap leach pads during the loading and unloading of material from the haul trucks. As a result, this noises are generated on a 24-hour per day basis. The noise from blasting occurs once per day, during the day. Noise from loader operations occurs when the haul trucks are filled with material from the open pits; therefore, the noise generation is from within the open pits on a 24-hour per day basis.

The noise generated by these operations is typical of most mining projects and could be intense, up to 95 dBA at 25 feet. Blasting can cause very short-duration noise levels in excess of 100 dBA at 25 feet. Assuming an average reduction of six (6) dBA when the distance from a noise source is doubled, the impacts to the nearest residences, which are approximately 500 feet east of the Descarga operations, can range from 63 to 76 dBA. Noise levels at the residences approximately 3,000 feet northeast of the Yellow Aster open pit can be in the range of 50 to 60 dBA adjacent to the outside of the residential structure. This is a maximum noise level, because as operations progress, a majority of the equipment operations and blasting is occurring in the open pits, which is below grade. The walls of the pits absorb some of the noise and tend to direct the rest of the noise upward, thus reducing the noise levels at the residence. This analysis is consistent with the over-pressure (air vibration or shock wave) monitoring conducted in Randsburg for the Yellow Aster Mine. In the vicinity of the Baltic operations, RMC has conducted an acoustical analysis (Walker, Celano & Associates, 1994; Appendix K). Monitoring was conducted over periods up to 22 hours in February, March and May of 1994 at three (3) locations in the Dog Patch area. The analysis of the collected data indicates that the composite noise exposure in the Dog Patch area, computed per National Research Council recommendations, is in conformance with the outdoor noise requirements of the Kern County Noise Element of the County General Plan (Walker, Celano & Associates, 1994). Some recreational users and other residents of the area, such as those in Randsburg, Dog Patch and Red Mountain, may be affected by blasting noise, but operational noise likely results in minimal impacts to the human environment.

4.11. Land Use and Wilderness

The main portion of the project area is located within portions of Sections 34 and 35, Township 29 South, Range 40 East and Sections 1, 2, 11 and 12, Township 30 South, Range 40 East, MDB&M. Land use within the project area consists of mineral exploration and development, public recreational use, wildlife habitat and livestock grazing. Mineral activities, wildlife habitat and livestock grazing have been discussed previously.

4.11.1. Land Use Classifications

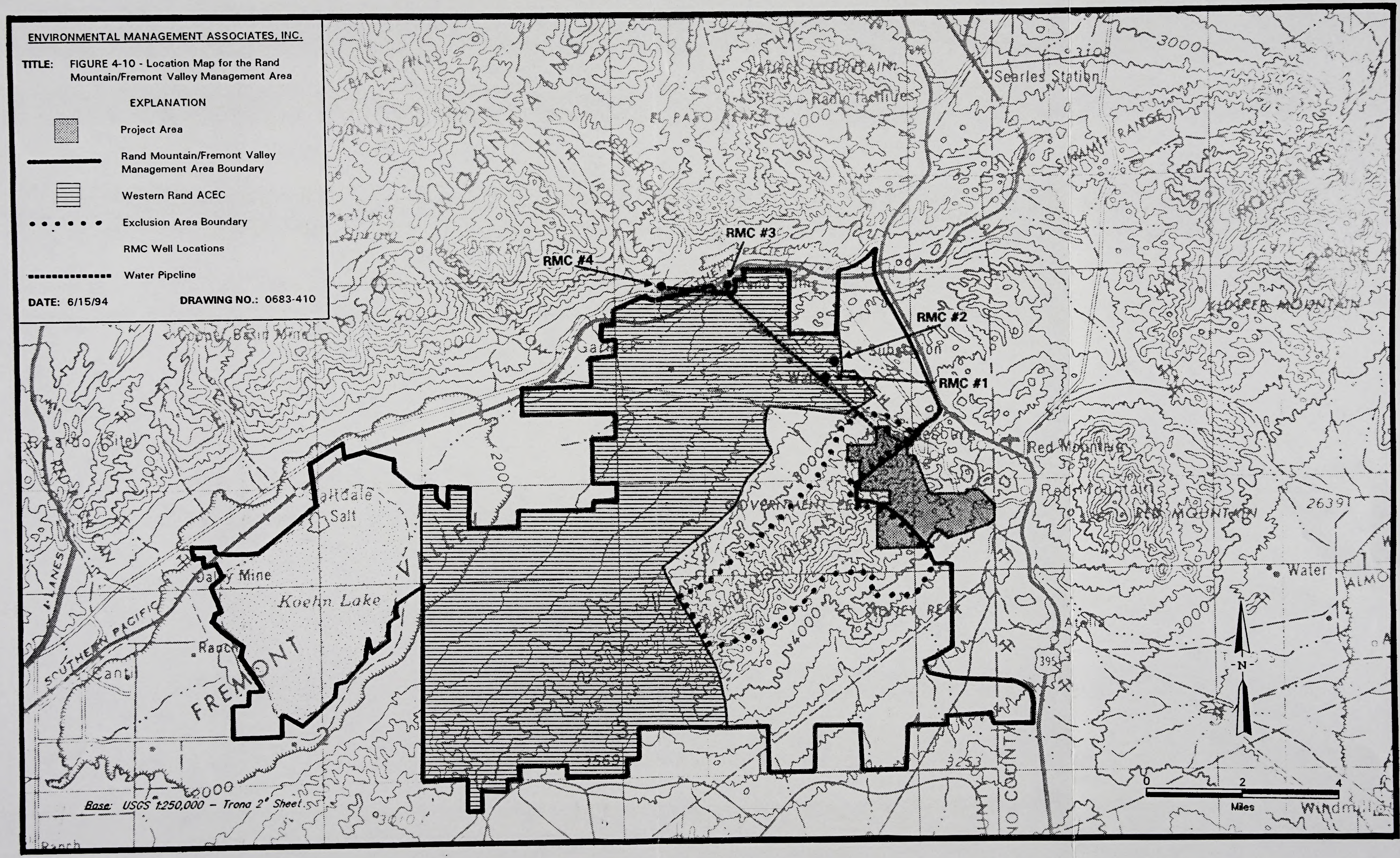
The project is located within the California Desert Conservation Area in a Class M multiple-use class area (see Section 1.2.4). In addition, the project area is located adjacent to and partially within the Rand Mountains/Fremont Valley Management Area (RMFVMA). The location of the project area in relationship to the RMFVMA is shown on Figure 4-10. The Mojave Desert Tortoise Natural Area (DTNA) is located approximately 11 miles southwest of the project area.

The project area is located to the southeast and partially within the recently expanded Western Rand Area of Critical Environmental Concern (Western Rand ACEC) (Figure 4-10). The only portions of the existing project actually within the Western Rand ACEC are the RMC water supply wells #1, #2, and #3 and a portion of the existing pipeline right-of-way.

The management of the RMFVMA, as described in the RMFVMA Plan, dated April, 1993, is directed towards ensuring that a viable population or populations of the desert tortoise continue in the RMFVMA. The portion of the Rand Mountains to the east of the RMFVMA, which includes the Rand Project area, was not included in the management area because of the limited amount of public land and low quality of the tortoise habitat (USDI, 1993). The portion of the Rand Project area within the RMFVMA is located within a 6,080 acre portion of the RMFVMA along the crest of the Rand Mountains which remains Land Use Class M and continues to allow for mineral entry as well as other use activities. A portion of the existing water supply pipeline, along with associated ongoing maintenance activities, that serves the RMC operations is located in a portion of the RMFVMA that would be designated land use Class L within the expanded Western Rand ACEC.

The BLM is also in the process of developing the West Mojave Coordinated Management Plan (Mojave Plan) (Gum, 1993). The Rand Project area is also within lands to be covered by this plan. The Mojave Plan will be designed to manage critical habitat for the desert tortoise and the Mohave ground squirrel through the designation of seven (7) management areas. The management areas will be subdivided, based on four (4) zones of management activities. The Rand Project area is currently located within an area identified for the continuation of existing types of activities (Gum, 1993).

The BLM has issued a number of right-of-ways within and surrounding the project area. These include a powerline withdrawal (SO 11/11/1929; Wdl Pwr S Cl; 241; 20"); a powerline right-of-way (R 2817; 12.5"; 3/4/1911); two (2) telephone cable right-of-ways [(CACA 23092; 5'; UNDGD)(CACA 15546; 5'; UNDGD)]; and three (3) telephone line right-of-ways [(LA 0125334; 15'; 3/4/1911)(LA


ENVIRONMENTAL MANAGEMENT ASSOCIATES, INC.
TITLE: FIGURE 4-10 - Location Map for the Rand Mountain/Fremont Valley Management Area
EXPLANATION
Project Area
Rand Mountain/Fremont Valley Management Area Boundary
Western Rand ACEC
Exclusion Area Boundary
RMC Well Locations
Water Pipeline
DATE: 6/15/94
DRAWING NO.: 0683-410
RMC #1
RMC #2
RMC #3
RMC #4
Searles Station
Red Mountain
Koehn Lake
FREMONT
SOUTHERN PACIFIC
Salt
Water
395
N
0
2
4
Miles
Base: USGS 1:250,000 - Trona 2° Sheet

0152574; 15'; 3/4/1911) (LA 0119205; 15'; 3/4/1911)].

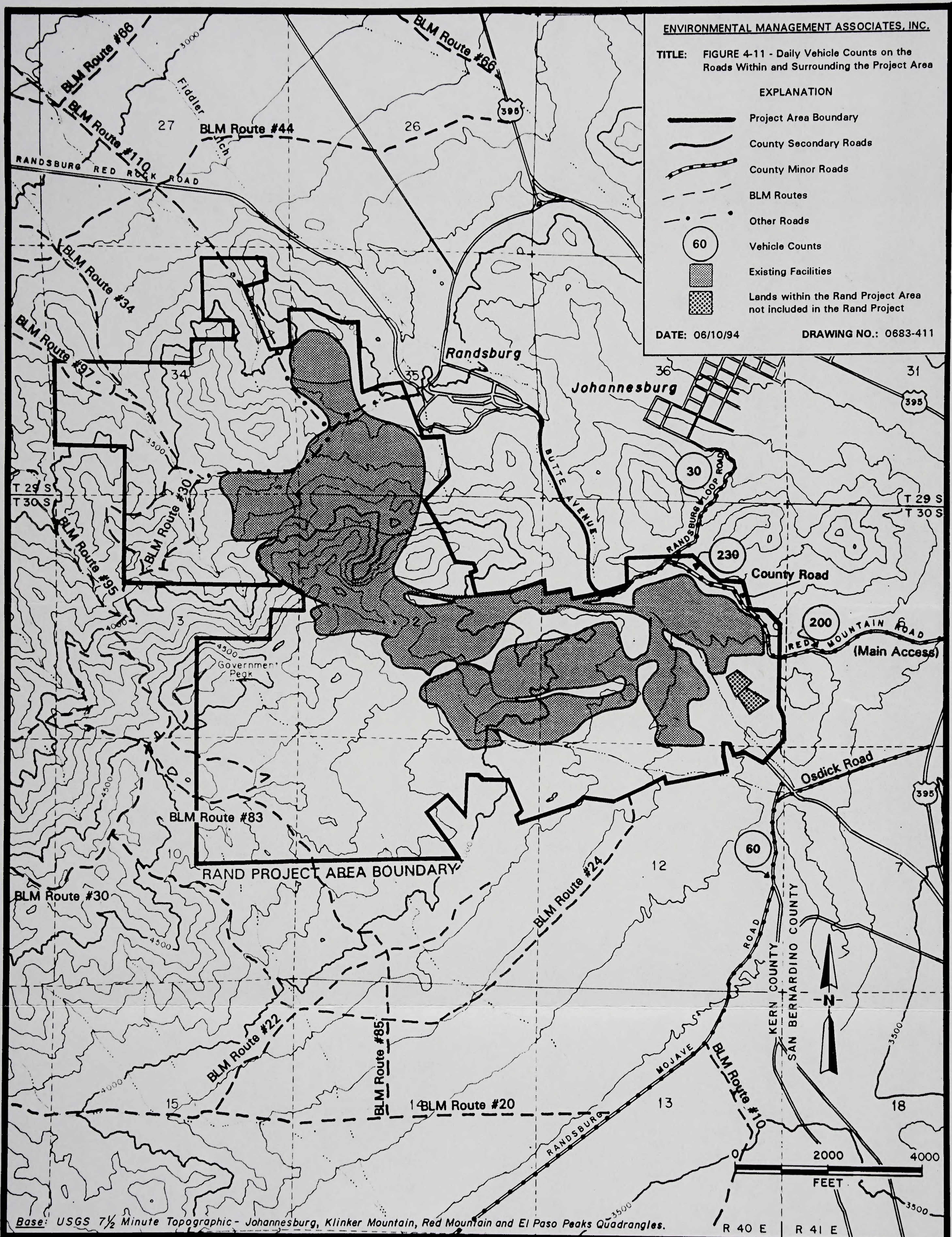
The project area is located in Kern County zoning districts NR20 (Natural Resources District 20 ac. min.) and A1 (Limited Agriculture District), and the county land use map indicates a Resource designation. Uses allowed under this designation include general agricultural uses, residential uses and resource extraction and energy development uses. Mining activities are allowed in these zoning districts upon issuance of a Conditional Use Permit.

4.11.2. Road System

A county secondary road and several minor roads are located adjacent to the project area. Kern County has conducted vehicle counts of traffic use on these county roads and has been supplied with vehicle count data on U.S. Highway 395 from Caltrans. The most recent information is for 1990 (Cannon, 1991). This traffic information has been modified to reflect the recent closure of a portion of Butte Avenue and the construction of the relocated county road around the Baltic Mine Project (Figure 4-11). As revised, approximately 230 trips per day are made on Butte Avenue south of Randsburg. Of these 230 trips, 30 trips continue on the Randsburg Loop Road into Johannesburg and the remaining 200 trips continue on the relocated road around the Baltic Mine Project facility to Red Mountain and either enter on to U.S. Highway 395 or stop in Red Mountain. Of these 200 trips, 60 continue on U.S. Highway 395 for approximately 0.5 miles and then exit on to the Randsburg-Mojave Road. Kern County has designated Butte Avenue as a secondary road and all other county roads in the project area as minor roads. BLM routes for OHV use in the area surrounding the project area are shown on Figure 4-11.

4.11.3. Recreation Resources

Public recreational use of the Rand Mountains area consists mostly of OHV use, both by individuals and by OHV enthusiast organizations (Phillips, 1991). Identified BLM routes for OHV use in the area surrounding the project area are shown on Figure 4-11. The Spangler Off Highway Vehicle Area is located



ENVIRONMENTAL MANAGEMENT ASSOCIATES, INC.
TITLE: FIGURE 4-11 - Daily Vehicle Counts on the Roads Within and Surrounding the Project Area
EXPLANATION
Project Area Boundary
County Secondary Roads
County Minor Roads
BLM Routes
Other Roads
60
Vehicle Counts
Existing Facilities
Lands within the Rand Project Area not included in the Rand Project
DATE: 06/10/94
DRAWING NO.: 0683-411
BLM Route #66
BLM Route #110
BLM Route #44
BLM Route #34
BLM Route #97
BLM Route #30
BLM Route #95
BLM Route #83
BLM Route #24
BLM Route #22
BLM Route #85
BLM Route #20
BLM Route #10
RANDSBURG RED ROCK ROAD
Fiddler
Randsburg
Johannesburg
BUTTE AVENUE
RANDSBURG LOOP ROAD
30
230
County Road
200
RED MOUNTAIN ROAD
(Main Access)
Osdick Road
60
395
Government Peak
RAND PROJECT AREA BOUNDARY
KERN COUNTY
SAN BERNARDINO COUNTY
MOJAVE ROAD
RANDSBURG
N
T 29 S
T 30 S
R 40 E
R 41 E
0
2000
4000
FEET
27
26
34
35
36
31
3
2
6
10
12
7
15
14
13
18
3000
3500
4000
4500
Base: USGS 7½ Minute Topographic - Johannesburg, Klinker Mountain, Red Mountain and El Paso Peaks Quadrangles.

approximate 8 miles north of the project area, on the east side of U.S. Highway 395. Numerous organized OHV events have been held around the area in the past; however, in recent years the number of these events has been reduced (USDI, 1993). The unorganized OHV casual use in the area has increased due to restrictive limitations in the surrounding areas. Four-wheel vehicle use of the area is generally to the west of Government Peak; access to Randsburg is generally via travel on the Randsburg-Mojave Road to the Red Mountain area, and then in to Randsburg (Grimsley, 1993). Motorcycle use appears to be more widespread than the four-wheel vehicle use; also occurring to the north and south of Government Peak. Access to Randsburg by the motorcycles is to the north from the Government Peak area, on BLM Routes 30 and 34, to an undesignated dirt road in Section 34, which leads directly in to Randsburg (Figure 4-11). Randsburg is a destination of choice for OHV recreationists, and long distance trips can start from several locations. Many of the OHV used in the area are not licensed for highway or county road use.

There are approximately 65 miles, or 120 acres, of OHV routes in the northeastern Rand Mountains that are currently used (USDI, 1989 and 1993). The approval of the RMFVMA Plan in 1993 established a network of designated OHV routes within the RMFVMA. These designated routes total approximately 22 miles, or 40 acres, of road. Of the remaining 43 miles, or 80 acres, of routes approximately 38 miles, or 70 acres, will eventually be closed under the RMFVMA Plan.

In addition to OHV use, other recreational uses of the area include hunting for chukar, target shooting and miscellaneous other recreational uses. The nearest public parks or recreation areas are the Randsburg city park and the Red Rock Canyon State Park, located approximately 20 miles west of the project area.

4.11.4. Wilderness

The closest existing wilderness areas to the project area are the Death Valley Wilderness, which is approximately 50 miles to the northeast, and the Domeland Wilderness, which is approximately 50 miles to the northwest. There are 21

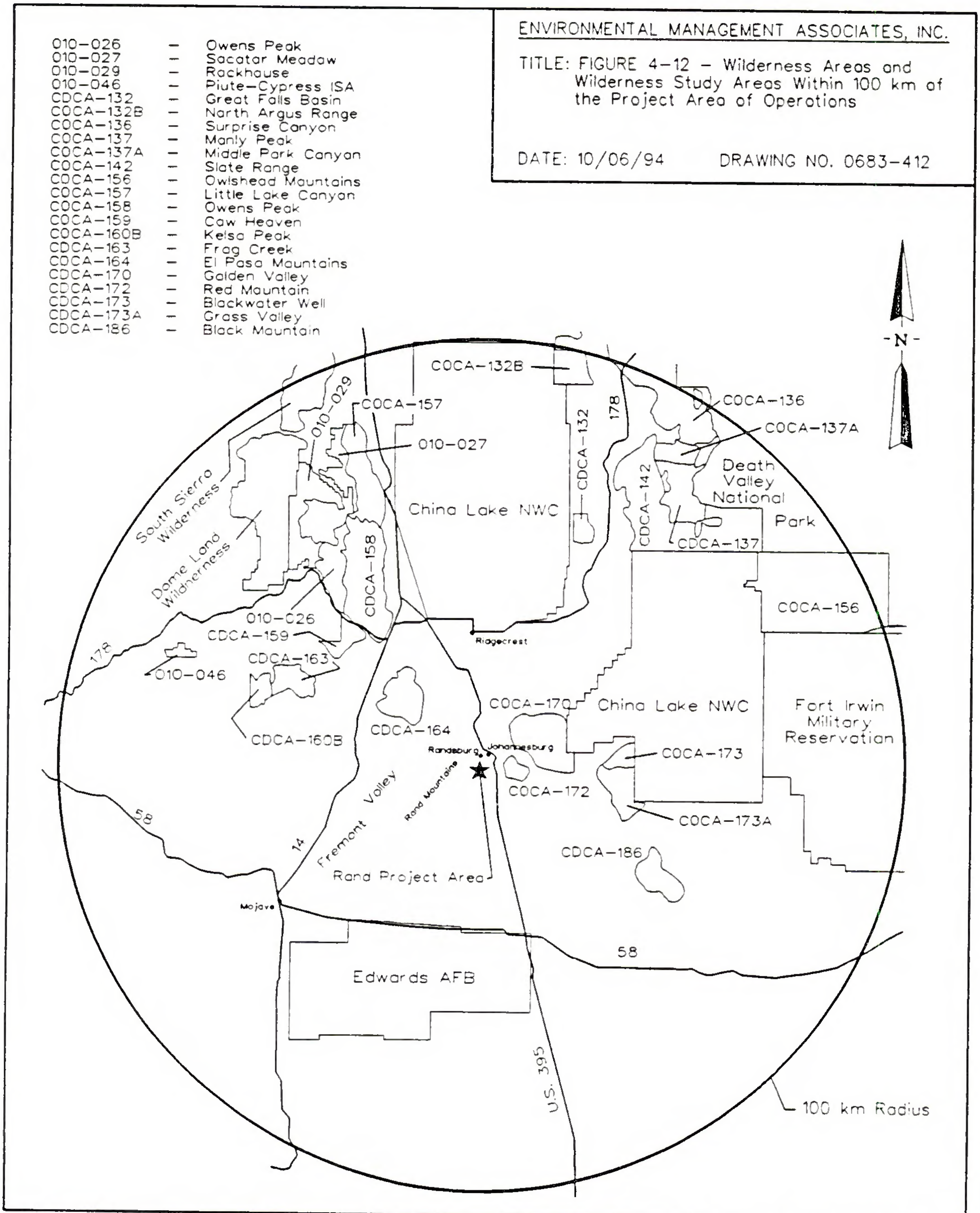


Figure 4-12: Wilderness Areas and Wilderness Study Areas Within 100 km of the Project Area of Operations.

Wilderness Study Areas (WSAs) within 60 miles (100 kilometers) of the project area (Figure 4-12). The closest WSA to the project area is the Red Mountain WSA, which is approximately two (2) miles to the east. Under the current version of the California Desert Protection Act (CDPA), 13 of the 21 WSAs would be designated as wilderness areas. Of these 13 areas, the closest ones to the project area are the Golden Valley WSA and the EL Paso Mountains WSA, which are 5 miles northeast and 10 miles northwest of the project area, respectively. The CDPA, in its current form, would also reclassify Death Valley as a National Park and expand its boundaries.

4.12. Socioeconomics

The nearest population center to the project area is the town of Randsburg, approximately 1 mile north of the project area. Most services are obtained in Ridgecrest, approximately 25 miles north of the project site. Based on information obtained from the Ridgecrest Chamber of Commerce, Ridgecrest serves a population exceeding 38,000, which includes China Lake, Inyokern, Johannesburg, Randsburg, Red Mountain, Trona, Argus Westend, Kern River Valley Area and Owens Lake Area (Ridgecrest Chamber of Commerce (RCC), 1986).

The economy of Ridgecrest has been based principally on support of the Naval Air Weapons Station (NAWS) at China Lake since the NAWS was established in 1943. The NAWS and industries directly related to the NAWS are the major source of employment in the Ridgecrest area. Other employers in the area are manufacturing plants, tourism, mining and the government (RCC, 1993).

Information on current housing availability for the Rand Communities (Randsburg, Johannesburg, Red Mountain and Atolia) and the surrounding area is not documented. Electricity in the project area is provided by SCE, telephone service is provided by Contel, and water service is provided by the Rand Communities Water District. One (1) elementary school is located in Johannesburg, approximately 1 mile north of the project site, while all other education is provided in Ridgecrest. Road maintenance is provided by the governmental division (state, county, or city) otherwise responsible for each particular road. The Kern County Sheriff's

Department provides law enforcement to the Randsburg area out of the Ridgecrest substation located about 25 miles to the north. Fire protection is provided by the Kern County Fire Department Station in Randsburg. Ridgecrest has an 76-bed hospital, three (3) medical clinics, 19 physicians/surgeons and one (1) ambulance service (RCC, 1993).

The existing RMC operations employ approximately 140 individuals as regular employees for the mining, leaching, technical and administrative duties at the existing RMC operations. This provides a total annual payroll of approximately $6,000,000.00 (Stillar, 1994). In addition, RMC pays approximately $200,000.00 per year in property taxes. Approximately $10,800,000.00 in operating and maintenance supplies are purchased from local vendors, and approximately $600,000.00 of power is purchased from the electrical utility. These jobs, and the amount of local expenditures, result in secondary economic benefits through increased local service employment. Using the BLM's mining employment multiplier for the California desert area of 2.666 (Anderson, 1989), approximately 373 secondary jobs have been created as a result of RMC's existing operations.

Mining and processing operations are conducted 24 hours per day, seven (7) days per week, 365 days a year. Most of the salaried staff works one (1) shift per day, five (5) days per week. Thirty-two (32) of the employees (approximately 25 percent) live locally, in the towns of Randsburg, Johannesburg and Red Mountain. Eighty-seven (87) of the employees (approximately 65 percent) reside in Ridgecrest and commute to the mine site each day. The other 21 employees (approximately 15 percent) reside in other communities in the regional area and commute to the mine site each day. Because carpooling is prevalent in this area, there are approximately 40 trips per day between Ridgecrest and the other communities in the region and the project site. The traffic is spread over a 24-hour period. Currently, the use of U.S. Highway 395 between Ridgecrest and the project area is approximately 4,000 vehicles per day (Cannon, 1991). Traffic from RMC's existing operations is approximately 1.0 percent of the daily use of U.S. Highway 395.

4.13. Other Resources

The existing operations are not located: in or adjacent to wilderness areas or WSAs; in an area of prime and unique farmland; in a floodplain; on a wild and scenic river; or in an area of traditional Native American religious concern.

CHAPTER 5
ENVIRONMENTAL CONSEQUENCES

5. ENVIRONMENTAL CONSEQUENCES

5.1. Proposed Action

5.1.1. Mineral Resources

Implementation of the Proposed Action would result in the removal of an additional 132 million tons of material during the extended operation of the project. In addition, the continued expansion of the open pits, waste rock stockpiles, heap leach pads and other project facilities may affect the development of other mineral resources in the immediate vicinity of the project area. The continued expansion of the open pits would allow for easier access to deeper mineralization and development of additional processing facilities may allow adjacent mineral occurrences to be mined economically. Conversely, placement on the land surface of the waste rock stockpiles and heap leach facilities may make other potential undiscovered mineral occurrences which may be located beneath these facilities inaccessible due to the increased material covering them; however, the portion of the project area where these facilities would be located has been explored and the likelihood of undiscovered mineral occurrences in those areas is low.

5.1.2. Physiography and Geology

The Proposed Action would permanently alter the topography of the project area, including the disturbance of approximately 511 acres and the removal of approximately 60 million tons of ore and 72 million tons of waste from the enlargement of the three (3) existing open pits and the new satellite pit. The Yellow Aster open pit would increase by 1,000 feet in length, 1,300 feet in width and 300 feet in depth. The Lamont open pit would increase by 1,800 feet in length, 300 feet in width and 140 feet in depth. The Baltic open pit would increase by 300 feet in length, 200 feet in width and 40 feet in depth. When mining is completed: the Yellow Aster open pit would be 4,400 feet in length, 3,000 feet in width and 800 feet in depth; the Lamont open pit would be 4,000 feet in length, 1,100 in width and 380 feet in depth; and the Baltic open pit would be 2,400 feet in length, 1,500 feet in width and 440 feet in depth. The satellite open pit would be approximately 2,300 feet in length, 1,000 feet in width and 400 feet in depth. In total, the open pits, both existing (193 acres) and proposed (132 acres), would cover 325 acres.

Implementation of the Proposed Reclamation Plan as part of the Proposed Action for the project would result in the reclamation of the 511 acres disturbed under the Proposed Action and 62 acres of previous RMC disturbance from the Lamont and Descarga operations which are not now covered by a SMARA Reclamation Plan. Although reclamation of the project area would occur, the ore and waste rock would be permanently removed from the open pits. The waste would be placed in the waste rock stockpiles and the ore would be placed on the leach pads. Once reclamation was completed on the project, new, permanent landforms, many with heights of over 200 feet above previous ground surface, would still remain. The heap would have overall slopes of 2H:1V, and the waste rock stockpiles would be terraced with an overall slope at 2H:1V. The slope configurations for the heap would be similar to those used at the existing RMC facilities, and no slumping or slope failure at the facility is anticipated. The open pits would be constructed in igneous and metamorphic rock, and the pit walls would have 20-foot safety benches and overall slopes of 45 degrees. Previous experience by RMC at the existing open pits shows that this configuration is stable, and no slumping or slope failure of the enlarged pits is anticipated. The slope configurations for the waste rock stockpiles would also be similar to those used at the existing RMC facilities, and thus no slumping or slope failure at the new facilities is anticipated.

RMC proposed off-site reclamation would regrade 37 acres of historic surface disturbance that would not otherwise be reclaimed.

The Proposed Action would create conditions which could potentially be affected by geologic hazards, which include seismic activity and slope stability. The project is located in an area of moderate seismic activity. If a seismic event did occur, the possible hazards would include horizontal and vertical ground accelerations and ground failure. The project facilities have been designed to meet or exceed building code requirements for earthquake safety applicable to the area. Appreciable ground shaking from blasting in the pits is expected to be localized to the project area. Based on the monitoring done in Randsburg for the Yellow Aster Mine and Red Mountain for the Baltic Mine, it is expected that the surrounding areas would experience no to minimal ground shaking as a resulting of continued blasts.

5.1.3. Soils

Impacts from the Proposed Action on the soil resources in the project area would result from disturbance of the soils during salvage operations, the burial of some soils by new facilities, increased erosion, and decreased soil biological activity. The Proposed Action would result in the disturbance of approximately 511 acres of soils. The loss of the soil resource would be minimized by the salvaging and stockpiling of the soil horizons. Approximately 687,000 cubic yards of soil, (equal to an average of 10 inches of soil over the 511 acres to be disturbed), would be stockpiled from the areas to be disturbed under the Proposed Action. Although the soil salvaging is directed towards removing and stockpiling all soil "A" horizons (which range from 0 to 6 inches in thickness) from the areas to be disturbed, there would still be between 7 and 37 inches of soil material (mostly "B" and "C" horizons, but possibly some "A" horizon) that would not be salvaged and either combined with waste material in the waste rock stockpiles or covered by the construction of the heap leach facilities and waste rock stockpiles.

Some minimal erosion of the residual soils in disturbed areas is expected from surface runoff and precipitation events prior to the completion of reclamation of these areas. In addition, wind erosion would also likely occur. However, RMC would water and or apply a palliative, such as sodium lignosulfonate, to all active project operation areas, which would minimize the amount of wind erosion.

Soil biological activity would be significantly reduced or eliminated during stockpiling as a result of anaerobic conditions and/or compaction within the deeper portions of the stockpiles. After reclamation and redistribution of the stockpiled soils has occurred, soil biological activity should begin to return and in the long term develop to pre-salvage levels.

After reclamation of the project, erosion in an amount greater than the normal losses from erosion of undisturbed areas is expected. Using the Revised Universal Soil Loss Equation (RUSLE), a slope of 2H:1V would have erosion losses in the range of 3.0 to 4.1 tons per acre per year. However, it can be anticipated that soil erosion losses in the project area would decrease over time as vegetation density increased.

5.1.4. Hydrology

5.1.4.1. Surface Water

The Proposed Action would result in surface disturbance within the high-order drainages that trend both southeast towards the Cuddeback Lake area and northwest towards the Fremont Valley. As a result of these activities an additional approximately 538 acres would become internally drained. This would be an approximate 30-percent decrease in the area subject to surface water runoff from the project area. Some increase in sedimentation in these drainages would result from activities in the non-internally drained areas, however this would be offset by the decrease in sedimentation to these drainage due to the increase in internally drained areas. This increased sedimentation would be from the waste rock stockpiles, the topsoil stockpile and roads. All flows upstream of the open pits would be captured by the pits. However, sedimentation in flows from disturbed areas downstream of the pits would occur. The surface flows on the heap leach facilities would be controlled and retained for evaporation. Surface flows upstream of the heap leach facilities would be diverted around the facilities via ditches. Because of the implementation of the runoff control measures and concurrent reclamation, proposed as part of the Proposed Action, it is anticipated that there would be only a minimal increase in sedimentation of ephemeral surface waters as a result from implementation of the Proposed Action.

Surface flows (runoff) from the unreclaimed waste rock stockpiles would be less than that from the reclaimed waste rock stockpiles due to the greater infiltration rates of the unreclaimed waste rock. Runoff from the heap leach areas would be captured and not allowed to enter the surface drainage system until after neutralization and reclamation. The open pits are areas of internal drainage, and all waters within the pits would collect and either evaporate or infiltrate. Neutralization of process facilities fluids prior to facility closure would minimize the possibility of leaching chemicals from those fluids into surface waters.

If a greater than 100-year/24-hour storm event occurs, simultaneously with a 24-hour power outage, flows from the heap leach facilities could exceed the design capacity of the ponds. This could result in the discharge of solution from the ponds into the drainage in the Lamont Valley area and eventually flow into the Mohr Pit, where the solution would likely collect and infiltrate. In the Descarga area the discharge would be into a small drainage just west of Randsburg, which eventually flows into Fiddler Gulch (Figure 2-9). The total water holding capacity of both heap leach facilities is somewhat less than the quantity of water that would enter the facilities from a 1,000-year storm event. If, in the extremely unlikely possibility, of a 1,000-year storm event occurring simultaneously with a 24-hour power outage, approximately 7.3 acre-feet of diluted process fluid would be released from the Lamont Valley heap leach facility into the drainage in the Lamont Valley, and approximately 1.6 acre-feet of diluted process fluid would be released from the Descarga heap leach facility into the drainage west of Randsburg. The cyanide concentration of that fluid would be equal to the concentration of cyanide in the operating solution as diluted by the storm waters, which would be a maximum theoretical cyanide concentration of approximately 42 ppm. However, in reality the concentration would be approximately 14 ppm because of the pH change that would occur in the fluid as it was diluted by the storm meteoric water, causing much of the cyanide to be released and diluted in the atmosphere. In addition, as the fluid was released from the ponds it would flow into storm waters generated by the 1,000-year event, further diluting the cyanide concentration. Therefore, within a short distance of the facility the cyanide concentration in surface waters would probably be significantly less than one (1) ppm.

5.1.4.2. Groundwater

In the Fremont Valley, impacts to groundwater would be associated with the production of water from the groundwater wells. RMC currently pumps an average of 400 gpm (576,000 gpd), for the Yellow Aster-Descarga, Lamont and Baltic operations. For the Rand Project, groundwater pumpage is projected to decrease to an average of 345 gpm (496,000 gpd) during a 16-year period beginning in 1995. The proposed groundwater production rate would be greatest during the first 11 years of the Rand Project (1995 to 2005), with an average annual pumping rate of approximately 450 gpm (648,000 gpd). The maximum average estimated production rate during this phase would be approximately 500 gpm (720,000 gpd). Groundwater production is proposed to decrease during the last five (5) years of the Rand Project (2006 to 2010), at which point the pumping rate would average 110 gpm (158,000 gpd).

As described in Chapter 4, groundwater modeling was performed to evaluate the impact of the Rand Project on groundwater conditions and vegetation in the northern Fremont Valley in general, and the RCWD wells in particular (Hargis + Associates, 1994). The modeling assumed that the groundwater production factors listed above for the Rand Project occurred 24 hours per day and 365 day per year. Modeling Case 2, which did not include the influence of regional wells, indicated a water table decline in the vicinity of RMC well #4 after 16 years of approximately 5.3 feet (see Table 5-1 and Figure 5-1). In the vicinity of the RCWD wells, approximately 2.0 miles to the south of RMC's well #4, a predicted drawdown of 4.1 feet after 16 years would occur. Because there is approximately 70 feet of water above the pumps in each well, the predicted water table declines associated with the Rand Project should not significantly affect production from the RCWD wells.

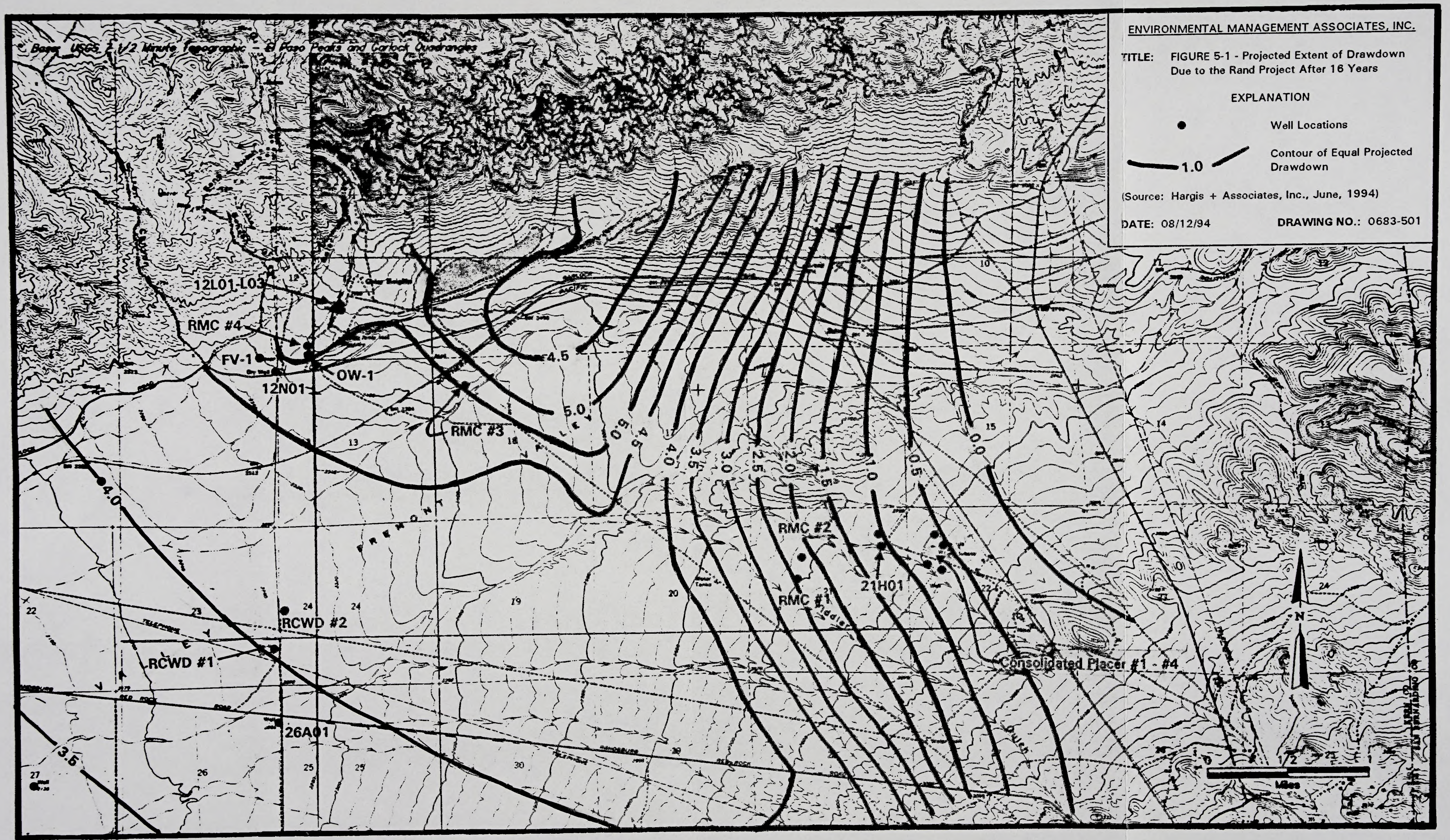

ENVIRONMENTAL MANAGEMENT ASSOCIATES, INC.
TITLE: FIGURE 5-1 - Projected Extent of Drawdown Due to the Rand Project After 16 Years
EXPLANATION
Well Locations
1.0
Contour of Equal Projected Drawdown
(Source: Hargis + Associates, Inc., June, 1994)
DATE: 08/12/94
DRAWING NO.: 0683-501
12L01-L03
RMC #4
FV-1
OW-1
12N01
RMC #3
RMC #2
RMC #1
21H01
RCWD #2
RCWD #1
26A01
Consolidated Placer #1 - #4
FREMONT
4.5
5.0
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
N
Miles

Table 5-1: Results of Northern Fremont Valley Groundwater Modeling - Case 2[1]

Model Run	Drawdown in the vicinity of RMC-4 (feet)			Drawdown in the vicinity of RCWD Wells (feet)		
	6 yr	12 yr	16 yr	6 yr	12 yr	16 yr
Case 2 - Proposed Rand Production	19.6	15.1	5.3	4.7	5.8	4.1

[1] Hargis & Associates, Inc., June, 1994

The difference in projected water level responses for the model Cases 1 and 2 (without and with the pumpage associated with the Rand Project, respectively) was used to provide a comparison of the water level impacts at the end of the existing mining operation versus those modeled at the end of the Rand Project. The difference in projected drawdowns due to the Rand Project pumpage is approximately 16.8 feet in the vicinity of RMC well #4 and 3.4 feet in the vicinity of the RCWD wells after six (6) years (Figure 5-2). The maximum difference in projected drawdowns due to the Rand Project pumpage in the vicinity of the RCWD wells is approximately 5.3 feet after 12 years.

The RMC consumption of groundwater is considered a temporary use because of the limited time frame of the project. Impacts to groundwater, particularly in conjunction with other operations in the area, are discussed further in Section 9.6.2, Cumulative Impacts to Groundwater.

Since no groundwater has been located in the immediate Rand Project area, there are no anticipated impacts from mining and heap leaching to groundwater in the project area. The Proposed Action could potentially degrade the quality of any unknown groundwater in the project area through the infiltration of leachate from the waste rock stockpiles, the seepage or spillage of cyanide solution from the heap leach facilities into the groundwater, or the infiltration of collected waters in the bottom of the open pit. However, the potential for any of this occurring is considered low.

ENVIRONMENTAL MANAGEMENT ASSOCIATES, INC.

TITLE: FIGURE 5-2 – Cross-section of Projected Drawdown due to Rand Project Pumpage Versus Current Pumpage

EXPLANATION

Water Table

Projected drawdown after 6 years without increased pumpage due to Rand Project (Model Case 1)

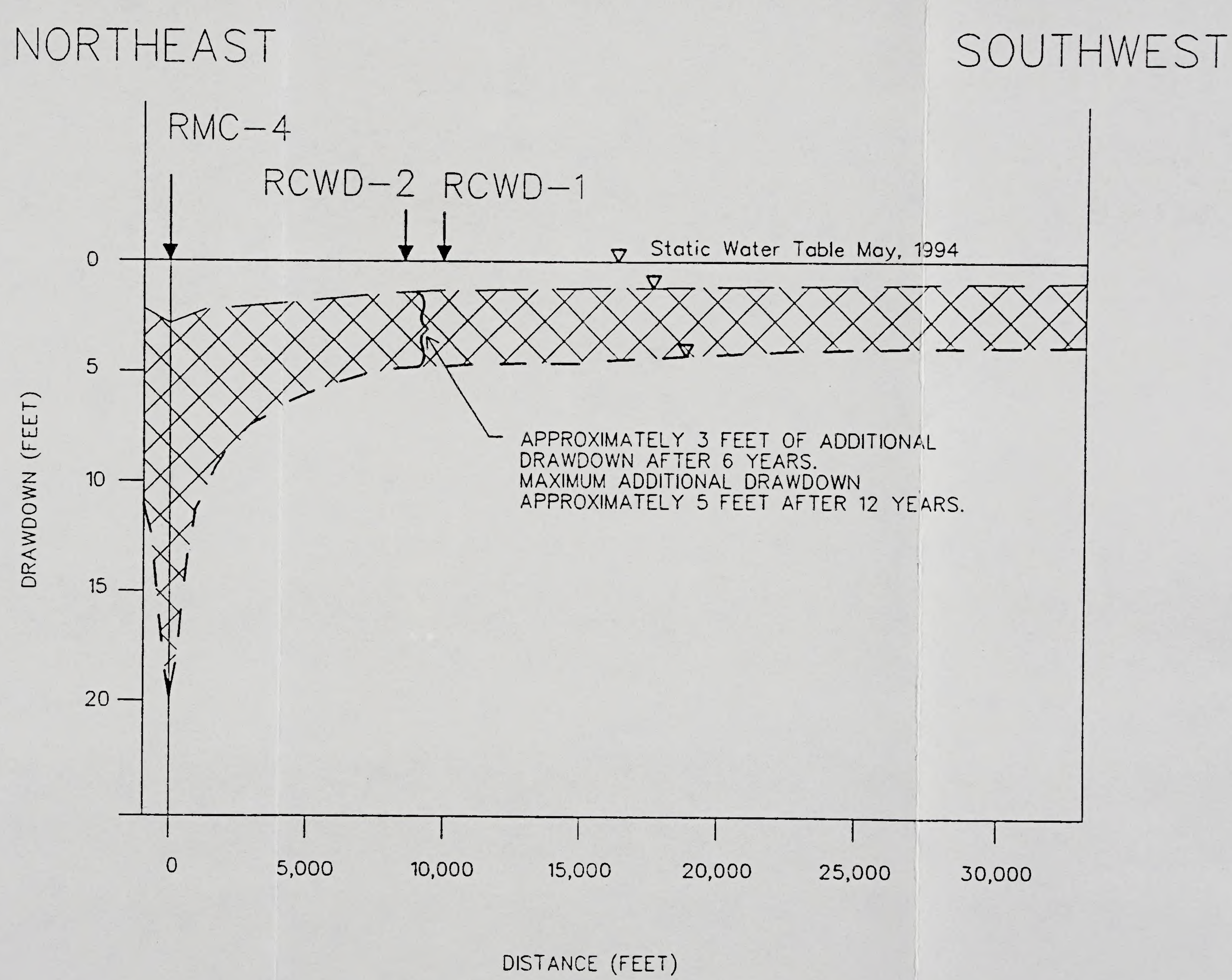
Projected drawdown after 6 years with increased pumpage due to Rand Project (Model Case 2)

Additional drawdown caused by increased RMC pumpage

Note: Projected drawdown based on Modflow Model results for Production Well RMC-4 pumping alone.

DATE: 06/27/94 DRAWING NO.: 0683-501

(Source: Hargis + Associates, Inc. June, 1994)



Recent laboratory tests of the ore and the material which would be disposed of in the waste rock stockpiles have shown that the material has a low potential to form an acidic leaching solution with elevated levels of heavy metals (see Section 4.4.1). The heap-leach facilities are designed, and would be constructed and operated, under an approval from the CRWQCB-LR to further minimize the potential for spillage or seepage to any unknown groundwater.

Modeling of water quality impacts using the PATH3D particle tracking model code indicated that the amount of estimated migration of the 500 mg/l TDS contour, on the order of 1,000 feet, is minor, and no discernable migration of the contour in the northeastern portion of the basin was observed in the model simulation results. Thus, the Rand Project pumpage should not adversely affect the groundwater quality in the vicinity of the RCWD or other production wells.

5.1.5. Air Quality

The primary impact to air quality from the Proposed Action would be particulate emissions (fugitive dust) from mining and ore processing operations. In addition, there would be some hydrocarbon and air toxics emissions from the operation of mining, ore processing and construction equipment.

Fugitive dust emissions would be generated from surface disturbance during construction activities and travel on unpaved roads by vehicles and construction equipment during construction and mining operations. Increased surface disturbance during construction would increase fugitive dust emissions which would, in turn, cause an increase in PM_{10}/TSP concentrations. Using the fugitive dust emission factor for newly disturbed surfaces associated with construction presented in EPA publication AP-42 "Compilation of Air Pollution Emission Factors", an estimate of the amount of fugitive dust generated by the new construction and associated surface disturbance under the Proposed Action can be calculated (EPA, 1985). Assuming the EPA-published emission factor of 1.2 tons of TSP per acre per month for an active construction site, approximately

80 pounds of TSP would be emitted per acre disturbed per actual day of construction activity. This emission rate could be reduced by a minimum of 50 percent (to approximately 40 pounds of TSP per acre per actual day of construction activity) by applying water spray and/or chemical treatment as a dust control measure, according to EPA AP-42. Assuming that 75 acres of the project would be disturbed for construction activities an average of 20 days, the total fugitive dust emissions, after the use of dust control measures, would be 30 tons of TSP. These emissions would occur during the initial months of the project, while construction activities are occurring.

WZI, Inc.'s estimate of the PM_{10} emissions from the Rand Project is provided in Appendix F. Table 5-2 is a summary of the calculated maximum hourly and annual PM_{10} emissions from these operations during 1998. Since the existing RMC mining operations and the proposed Rand Project mining operations do not require either crushing or screening of the ore prior to placement on the heaps, all of the significant PM_{10} emissions result from these same fugitive sources (drilling, blasting, loading, hauling, dozing, and wind erosion). Estimated annual PM_{10} emissions are less than 150 tons, less than a ten (10) percent increase in annual emissions over that of the existing RMC operations.

The primary sources of PM_{10} fugitive emissions during reclamation activities include the loading and unloading of topsoil, bulldozing, road emissions, and erosion from disturbed surfaces before vegetation is established. These emissions should be relatively minor compared to the operational emissions, and would be very similar to the emissions from reclamation of the existing projects, only occurring over a longer period. Sources of fugitive dust emissions after the first year of final reclamation would primarily be reclaimed surfaces with recovering vegetation, with emissions declining as vegetation is established.

Table 5-2: Estimated PM_{10} Emissions From the Proposed Action (1998)

FUGITIVE PM_{10} EMISSION SOURCE	ESTIMATED PM_{10} EMISSIONS		
	MAXIMUM POUNDS/HOUR	POUNDS/YEAR	TONS/YEAR
Ore Drilling (1001)	0.339	820	0.41
Waste Drilling (1001)	0.339	590	0.30
Ore Blasting (1002)	752	83,439	41.72
Waste Blasting (1002)	752	60,137	30.07
Truck Loading Ore (1003)	5.985	25,830	12.92
Truck Loading Waste (1003)	1.387	677	0.34
Hauling (1004)	2.69	49,926.1	24.96
Ore Dozing (1005)	3.81	1,832	0.92
Waste Dozing (1005)	11.55	3,582.9	1.79
Waste Wind Erosion (1006)	5.53	48,446	24.22
TOTALS	N/A	275,290.00	137.65

WZI Inc. prepared a supplemental assessment of the potential PM_{10} impacts of the Rand Project, including the existing RMC operations, at five (5) local sensitive receptor locations (Randsburg, Johannesburg, Johannesburg School, Red Mountain, and Dog Patch) (Appendix F). Table 5-3 summarizes the estimated maximum 24-hour average PM_{10} concentrations anticipated by the implementation of the Proposed Action, including the existing operations, at these locations. The slight increase in the PM_{10}/TSP emissions from the Proposed Action over that currently emitted from the existing RMC projects means that only a small portion of this increased ambient concentration of PM_{10}/TSP in the Randsburg/Red Mountain would result from the Proposed Action. Implementation of the Proposed Action would also extend the life of this air quality impact for an additional nine (9) to ten (10) years over the existing projects, which would result in the mine operating for approximately 12 years, or until approximately 2006, reclamation activities would then commence until the year 2012.

Table 5-3: Maximum Estimated 24-Hour PM_{10} Impacts From the Proposed Action.

LOCATION	UTM COORDINATES		CONCENTRATION ($\mu g/m^3$)
	EAST	NORTH	
Randsburg	440,500	3,913,930	9.0
Johannesburg	442,500	3,914,375	6.9
Johannesburg School	442,440	3,913,840	7.1
Red Mountain	444,000	3,912,625	6.6
Dog Patch	442,356	3,911,329	19.6
Dome Wilderness Class I Airshed	394,000	3,953,000	0.3
Death Valley Class 1 Airshed	492,000	3,972,000	0.3
Red Mountain Wilderness Study Area	445,400	3,914,000	5.3
Golden Valley Wilderness Study Area/Wilderness	447,100	3,916,850	2.5

As with the existing RMC projects, implementation of the Proposed Action would result in the emission of various air toxics, including metals from handling of the ore and waste rock, hydrogen cyanide from the leaching solution, and organic gases and some metals from the diesel engines for pumping water and gas-fired furnace. WZI, Inc.'s assessment of the air toxic emissions from the Proposed Action during calendar year 1998 is also presented in Appendix F. The WZI, Inc's. assessment indicated that the maximum estimated excess cancer risk from the Proposed Action at any of the population areas near the project area was 0.00000724, or seven (7) additional cases of cancer per one (1) million population, at Dog Patch, an increase from the estimated maximum cancer risk of 0.0000029, or 2.9 additional cases of cancer per one (1) million population, from pre-project emissions. However, this is an extremely small increase in the risk of cancer for the general population of the United States (0.333, or 333,333 additional cases of cancer per one (1) million population), and is at a level which the KCAPCD still defines as not significant.

As a result of the natural degradation of sodium cyanide, hydrogen cyanide gas is generated. Ongoing monitoring for hydrogen cyanide at the Yellow Aster

Mine Project includes sampling the heap leach pad and pond and the ambient weather conditions. This monitoring indicates that the hydrogen cyanide concentrations are consistently less than or equal to 4.7 ppm, which is significantly less than the ten (10) ppm threshold limit/time-weighted average for a normal 8-hour work day established by the OSHA for sustained breathing of gaseous HCN, and significantly less than the State of California 11 ppm threshold. Levels from the Rand Project are anticipated to be essentially identical.

The Rand Project is not subject to the EPA's New Source Performance Standards (40 CFR 60.386-60.388), principally since no crushers, screens or loading stations are used by the Proposed Action (nor the existing RMC projects).

Because essentially all of the PM_{10} emissions from the Proposed Action are fugitive emissions, the Proposed Action is not subject to PSD regulations. However, WZI, Inc.'s assessment of the PM_{10} emissions from the Rand Project (Appendix F) included an assessment of the impact to the two (2) existing Class I airsheds located within 100 kilometers of the proposed project area. In addition, WZI, Inc. conducted a supplemental assessment (Appendix F) which also assessed the impact of the Proposed Action. Under the current version of the CDPA, the Golden Valley WSA would be designated as wilderness, which is the closest WSA to the project area. It is unlikely that this area would be designated as a Class I. Table 5-3 lists the estimated maximum 24-hour average PM_{10} concentrations anticipated by the implementation of the Proposed Action, including the existing RMC operations, at these two (2) Class I airsheds and the two (2) WSAs. As can be seen, the impacts to the Class I airsheds and the two (2) WSAs fall well below the maximum permissible increase of 10 $\mu g/m^3$ (24-hour maximum) allowable in a Class I airshed under PSD regulations, even if RMC's operations were subject to this limitation, which they are not.

5.1.6. Vegetation and Range Resources

5.1.6.1. Vegetation Communities

Implementation of the Proposed Action would disturb approximately 511 acres of vegetation, primarily creosote bush scrub community. With the exception of the 132 acres of proposed open pit area, this impact would be temporary, until the completion of reclamation activities. In the long-term, successful reclamation utilizing regrading, topsoil placement and revegetation, all in accordance with the Proposed Reclamation Plan, is expected to effectively reduce most impacts to vegetation, although the redistribution of topsoil undertaken in association with reclamation activities would result in thin, mixed soils which may favor the support of plant species with shallow roots, such as grasses and forbs. As a result of the surface disturbance, it is expected that there would be natural re-colonization of the area by surrounding species. Of the colonizing species, R-selected species, including "invader species", would initially develop in the recently disturbed areas. However, as the area became more established, K-selected species would then become established in the area.

As part of the Proposed Action, RMC would transplant the juvenile, non-articulated Joshua trees, Golden cholla and Beavertail which are located in areas to be disturbed. RMC would also try to avoid the removal of Joshua trees, Golden cholla and Beavertail during construction, operation and reclamation activities. This would minimize impacts to these species, although some individual plants will most likely be lost. No impacts to Red Rock Poppy found in Section 1, Township 30 South, Range 40 East, MDB&M. are expected to occur as a result of the proposed expansion of the Baltic Mine under the Rand Project. The plants are found outside of previously or proposed areas of disturbance, and represent a narrow distribution within the project area as a whole. No impacts to any known endangered, threatened, rare or sensitive plant species are anticipated from the implementation of the Proposed Action.

Although limited, current information indicates that the extraction of groundwater for and by the Proposed Action would result in an additional lowering of the watertable in the area around RMC #4 by as much as 19.6 feet. However, the depth to the water table in the area that would be affected by the additional water table decline (approximately 350 feet bgs) is already significantly below the root depth of the species which inhabit that area (Hargis + Associates, 1994). Thus, no impact to vegetation resources in the Fremont Valley is expected from the pumping.

As part of the Proposed Action, RMC would re-vegetate 37 acres of historic surface disturbance in the Rand or El Paso mountains, which would not otherwise be reclaimed.

5.1.6.2. Range Resources

The Proposed Action would result in the disturbance of approximately 511 acres of vegetation within the Cantil Common Allotment. In addition, the project area would be fenced during the construction, operation and reclamation, which would limit grazing access to a total of approximately 2,520 acres for approximately 16 years. Based on the range of grazing capacity of the allotment, this removal of 2,520 acres would temporarily remove between approximately 252 and 6,300 tons of forage per year from potential use (although grazing has not been permitted on this portion of the Cantil Allotment since 1989 because of the drought and tortoise restrictions). Because the reclamation seed mixture for revegetation does not include annual species, the post-reclamation forage production would likely be less than current rates. With the exception of the permanent removal of approximately 132 acres for the open pits from future forage production, there would be no other post-reclamation impacts on range resources such as fences, gates or water improvements.

5.1.7. Wildlife Resources

The following section evaluates the potential impacts of the Proposed Action on wildlife. The identified wildlife issues are: (1) reduction of wildlife habitat associated with surface disturbance; (2) potential exposure of wildlife to reagents and processing solutions; (3) introduction of artificial lighting; (4) increased noise levels and human presence; and (5) traffic-related impacts. Impacts to wildlife would be considered significant if any of the following were to occur:

- Substantial disturbance of threatened or endangered wildlife species, or a species likely to become threatened or endangered in the foreseeable future (e.g. Federal Category 1 species);
- Substantial disturbance or destruction of habitat that supports threatened or endangered wildlife species, or a species likely to become threatened or endangered in the foreseeable future;
- Substantial interference with the movement of resident or migratory wildlife species;
- Substantial reduction of habitat for a wildlife species; or
- Substantial number of mortalities of wildlife, including migratory birds.

Implementation of the Proposed Action would result in the destruction of approximately 511 acres of primarily creosote bush scrub habitat, resulting in a direct impact to the wildlife in the area. With the exception of the pit areas and portions of the heap leach pads, the habitat loss would be temporary, lasting until the completion of reclamation. Additional direct impacts to wildlife, such as death or injury, would occur due to traffic-related activities. In addition, an indirect impact could result from wildlife avoiding the project area during operations, thus temporarily removing additional areas from available wildlife habitat surrounding the project. Wildlife within these areas of indirect impact would typically be displaced to adjacent areas due to project exploration activities, facility construction and operation of the project, all of which would increase existing levels of noise, artificial lighting and human activity. This indirect impact to the wildlife would occur over an area estimated to be approximately 2,500 acres, which includes all the areas between the existing and proposed project facilities and an area-of-influence buffer. Because the extent of existing operations within the Rand Project area, much of this indirect impact has been occurring since the mid-1980's, but would be enlarged to 2,500 acres and extended in time as result of the Proposed Action. Loss of displaced wildlife is anticipated, although there is insufficient data to quantify the impact.

Because groundwater levels in the Fremont Valley are far below the root zone, no impact to desert tortoise habitat or the desert tortoise in Fremont Valley is expected from the additional production of groundwater.

The proposed use of netting over the process water ponds would limit impacts to any migratory or non-migratory birds. The use of netting over solution ponds by other gold mining companies utilizing cyanide in the western U. S. has proven effective in excluding migratory birds. However, impacts to wildlife resulting from cyanide ingestion is not limited to solution ponds, but includes pooling/puddling on top of heap leach pads and in drainage/collection channels. Ponding/pooling of leach solution on the top of the heap leach pads is not anticipated, but may occur, allowing wildlife the ability to ingest the solution. Ingestion of cyanide solution by wildlife can result in death. Animals seeking water could be attracted to exposed processing solution, creating a potential hazard for terrestrial and avian wildlife. Migratory bird mortality through cyanide toxicosis may be prevented at heap leach extraction facilities through the initial design of structures which deny birds access to toxic solutions.

Mohave ground squirrel is known to occur in the project area. However, the actual number of individuals present can not be determined with accuracy. Assuming an average density of between 15 and 20 individuals per square mile, then approximately 12 to 16 individual Mohave ground squirrels could be present within the 511-acre area that would be disturbed by the Proposed Action (Rado, 1993a and 1993b).

Myotis sp. and Townsend's big-eared bats have been observed in the vicinity of the Yellow Aster, Lamont and Baltic operations. As a result, activities to be conducted under the Proposed Action, such as the filling of the open shafts in the project area, could impact any bats that may reside in the shafts. However, because the two (2) shafts which field surveys indicated contained the greatest number of bats would not be directly affected by the Proposed Action, little direct or indirect impact to these bat species is expected.

Potential impacts to wildlife could occur from the use of sprinklers on the slopes of the heap. Avian species flying through the mist created during the sprinkler operation and then immediately preening their feathers could result in the ingestion of cyanide-containing solution. In addition, avian species or small rodents could ingest cyanide-containing solution by standing on the slopes of the heaps in the mist, or bathing or drinking in any small puddles which could form on the slopes. The design for the slopes of the Rand Project heap, including the use of sprinklers, is the same as currently used at the adjacent Yellow Aster and Baltic heap leach facilities. Monitoring of these heaps are conducted by walking the heaps daily. Since operations began at the Yellow Aster Mine in 1990 through the second quarter of 1993, an average of approximately nine (9) wildlife mortalities have been observed annually. It is anticipated that the rate of wildlife mortalities at the RMC projects will increase with the expansion resulting from the Proposed Action. One (1) mortality to a known sensitive species, prairie falcon (*Falco mexicanus*), has assumed to have occurred as a result of mine operation activities.

5.1.8. Cultural and Paleontological Resources

5.1.8.1. Cultural Resources

Of the 213 sites present within the project area, 74 would be partially or completely impacted by the Proposed Action. However, due to the poor condition of these sites and the limited amount of data they possess, the BLM has determined that none of these sites meet the criteria for inclusion to the National Register of Historic Places. While the remaining 139 sites will not be affected by the proposed development, they are also considered ineligible for inclusion to the National Register of Historic Places.

5.1.8.2. Paleontological Resources

Because there are no known paleontological resources in the project area, there would be no impact to paleontological resources as a result of implementation of the Proposed Action.

5.1.9. Visual Resources

Impacts to visual resources from the Proposed Action would result from the visibility of surface disturbance associated with construction and operation of project facilities; the creation and expansion of the new waste rock stockpiles; the creation and expansion of the heap leach facilities; the expansion of the open pits; and the dust plumes created from blasting in the open pits for an additional nine (9) to ten (10) years. The leach pad, waste rock stockpiles and access road construction as part of the Proposed Action would represent a visual contrast for viewers in the proximity of the project. However, the proposed project would not alter the existing appearance to the casual viewer because the type of activities outlined in the Proposed Action are consistent with past and present activities in the area.

Implementation of the reclamation plan would reduce some of the impacts associated with the surface disturbance over the long term. Following completion of the operation, the access roads constructed under the Proposed Action would be recontoured and seeded. The waste rock stockpiles would not be recontoured, but would be seeded and would ultimately resemble a stepped mesa. This would minimize the contrast of color and lines that exists from the current situation and which would be created by the mining under the Proposed Action. The open pits, waste rock stockpiles and heap leach piles would remain as a permanent change to the line and form of the area.

The level of impact to visual resources would depend upon the number of viewers of the project, the viewers' observation point, the compatibility of the operations with the BLM's visual management objectives, and the duration of the disturbance. Visual effects of the Proposed Action were analyzed using the standard procedures in Section 8400 of the BLM Manual. The form of the reclaimed project would approach the smooth, rounded character of the surrounding landscape, but would continue to have some areas with a conical form. The line of the reclaimed project would approach soft and undulating, but would remain discontinuous and have some areas with an angular line. The color of the reclaimed project would approach that of the surrounding landscape.

Accordingly, operations under the Proposed Action would have some visual contrast with the surrounding land even after reclamation. However, when the Proposed Action is viewed in relationship to the other current and historic activities in this part of the Rand Mountains, there is only a weak contrast. The project area, with the implementation of the Proposed Action, would contrast only slightly with the existing situation when viewed from each of the KOPs (Appendix J). Two (2) photographic visual simulations were prepared to illustrate the visual contrast of the Proposed Action with that currently approved operations (Photograph J-3, Photograph J-6). These two (2) photographs show an enlargement of the Yellow Aster and West Valley waste rock stockpiles and the three (3) open pits. In addition, the photographs show the creation of the new Lamont Valley heap leach and waste rock stockpile, and the satellite open pit.

The project area would be visible from only two (2) proposed wilderness areas, as designated under the current version of the CDPA; the proposed Golden Valley Wilderness and the proposed El Paso Mountains Wilderness. These proposed wilderness areas are located at a distance from the project area of 5 and 10 miles, respectively. Visibility of the proposed project operations from these two (2) proposed wilderness areas would be limited and not substantially different from that of the existing operations.

5.1.10. Noise

The construction and mining operations proposed to be conducted under the Proposed Action would be continuing sources of noise for the life of the project. These operations would be essentially identical to those currently occurring at the existing operations and would produce essentially identical noise levels, with some locational differences, over a longer time period. The noise generated by these operations would be typical of most construction and mining projects and could be intense, up to 95 dBA, at 25 feet. Blasting could cause very short-duration noise levels in excess of 100 dBA at 25 feet. Assuming an average reduction of six (6) dBA when the distance from a noise source is doubled, the impacts to the nearest residences, which are approximately 500 east of the Descarga heap leach operations, could be in the range of 63 to 76 dBA adjacent to the outside of the residential structures, and could be in the range of 60 to 65 dBA adjacent to the outside of the residential structures located approximately 1,500 feet north of the proposed Yellow Aster open pit expansion. This would be a maximum noise level, because as operations progress, a majority of the equipment operations and blasting would occur below grade in the open pits. The walls of the pits would absorb some of the noise and tend to direct the rest of the noise upward, thus reducing the noise levels at the residences. This would be consistent with the over-pressure (air vibration or shock wave) monitoring conducted in Randsburg for the Yellow Aster Mine Project. Some residents of the area, such as those in Randsburg, Dog Patch and Red Mountain, and some recreational users, would likely be affected by blasting noise, but construction and operational noise would likely result in at most minimal impacts to the human environment. In addition, blasting may be heard at the proposed Golden Valley Wilderness area and Red Mountain WSAs.

As discussed above in Section 5.1.7, wildlife populations may be affected by noise from the construction or mining phases of the Proposed Action, and would likely avoid the area during the life of the project.

5.1.11. Land Use and Wilderness

5.1.11.1. Land Use Classifications

The Proposed Action would be compatible with the existing land uses in and around the project area. Also, the Proposed Action would be consistent with the current Kern County land use designation for the project area. The proposed project would be consistent with the BLM's regulations and the California Desert Conservation Area Plan and amendments. That portion of the project which is located on BLM-administered land is located in a Class M, Moderate Use area.

A maximum of approximately 511 acres of land would be cleared for this project. Land use impacts from the proposed project would include restricted public access in the proposed project area. Also, these lands currently available for grazing would be committed to mineral development for the life of the project. These effects on grazing would be short-term, lasting only until the disturbed areas have been reclaimed; however, access to the pit areas would be permanently restricted for safety reasons. The Western Rand ACEC would not be impacted by the Proposed Action.

The Proposed Action is consistent with the past use of the land for mineral development, in addition to other uses. Some of the pre-existing hazards in the form of open shafts, pits, cuts and trenches would be eliminated as a result of the Proposed Action. This action is consistent with the multiple use class designation for the area under the CDCA Plan. This action is also consistent with the existing county zoning and land use designation for the area.

5.1.11.2. Road System

Access to Randsburg from Government Peak would be changed by the closing of the undesignated roads in Section 34 with the expansion of the West Valley Waste Rock Stockpile and the fencing of the entire project area, except for BLM Route 85 (see Figure 4-11). To compensate for the potential limitation in access to Government Peak and the Sunshine Mine area, RMC proposes to construct two (2) spur access roads, one (1) to change the alignment of BLM Route 85 in the southwestern portion of the project area, and another to come off of BLM Route 24 and provide direct access to the Sunshine Mine area. These two (2) spur roads would add approximately 1.0 acres of route-related disturbance. The Proposed Action would directly affect the road system network outside of the project area of operations by eliminating an additional 8.25 to 9 miles of route network. This additional mileage would be eliminated from the loop network and result in these routes becoming spur routes leading to closed gates or fences. Total trail mile impact is estimated to be approximately 13.5 to 14.25 miles out of a network of 135 miles. This would result in a loss of 10 to 15 percent of the area's current road network. The loss would occur after significant network reductions enacted by the Rand Mountains/Fremont Valley Management Plan, which had previously reduced the trail network by 630 percent. However, RMC, in coordination with the BLM would construct new portions of the loop access route under the BLM transportation system from Government Peak to Randsburg, which would eliminate the primary impact resulting from the fencing of the entire project area.

5.1.11.3. Recreation Resources

A maximum of approximately 511 acres of land would be cleared for this project and approximately 2,520 acres would be fenced. Recreation impacts from the proposed project would include restricted public access for recreation in the proposed project area. This would result in a loss of ten (10) to 15 percent of the area's current total OHV trail opportunities. The loss of riding opportunities would occur after significant network reductions enacted by the Rand Mountains/Fremont Valley Management Plan, which had previously reduced the trail network by 630%. In addition, the access to Randsburg by OHV recreationists, represents the loss of a primary recreation/service destination. These effects on recreational use would generally be short-term, lasting only until the disturbed areas have been reclaimed; however, access to the pit areas would be permanently restricted for safety reasons. OHV casual use would be impacted due to the road and route closures within the project area.

5.1.11.4. Wilderness

Impacts to currently designated Wilderness, areas proposed for Wilderness designation under the CDPA, and WSAs are limited to air quality, noise, and visual effects, which are specifically discussed in Section 5.1.5., Air Quality, Section 5.1.10., Noise, and Section 5.1.9., Visual Resources, respectively. The visibility impacts would be limited to views of the expansion of the existing views of the Yellow Aster highwall and the North waste rock stockpile. Air quality impacts would be limited to minor increase in PM_{10} concentrations in the wilderness areas, proposed wilderness areas and WSAs. Noise-related impacts would be minor increases in the decibels.

5.1.12. Socioeconomics

Impacts from the Proposed Action on the population of the area would occur during the construction and operation phases of the project. During the construction phase of the project, which would last approximately five (5) months, an average of approximately 20 contract construction workers would be expected to be working on the project site. Approximately eight (8) individuals would be hired as regular employees for the mining and leaching operations under the Proposed Action (of which RMC anticipates that 80 percent of these employees would be from the local labor force). This would not significantly change the existing annual payroll of approximately $6,000,000.00 (Stillar, 1994). RMC would pay approximately an additional $60,000.00 per year in property taxes, which would bring the total property taxes bill to $260,000.00 per year. The approximately $10,800,000.00 per year in operating and maintenance supplies which are currently purchased from local vendors would not significantly change under the Proposed Action. There would be an approximately $140,000.00 in additional power purchased from the electrical utility, which would bring the total annual power purchases to $740,000.00.

The creation of these new jobs and the amount of local expenditures would result in secondary economic benefits through increased local service employment. Using the BLM's mining employment multiplier for the California desert area of 2.666, approximately 21 new secondary jobs would be created by implementation of the Proposed Action, which would be in addition to the approximately 373 secondary jobs created as a result of RMC's existing operations (Anderson, 1989). In addition to these increases in expenditures and employment resulting from the Proposed Action, the existing expenditure and employment would continue for nine (9) to ten (10) years longer than currently planned and permitted. The total combined existing and proposed expenditures and employment figures are $17,800,000.00 per year, 148 employees and 394 secondary jobs for the next nine (9) to ten (10) years.

Because the addition of eight (8) individuals to the existing RMC workforce under the Proposed Action represents only a 0.5 percent increase, it is anticipated that all these individuals would join existing carpools and, therefore, there would be no net increase in traffic on the highways as a result of the Proposed Action. However, the existing traffic on U.S. Highway 395 related to RMC's existing operations, which is approximately 1.0 percent of the total traffic volume, would occur for an additional nine (9) to ten (10) years longer than currently planned. The construction workers would likely live in Ridgecrest and commute seven (7) days a week to the project site, resulting in approximately 30 trips per day. Therefore, during the five (5) month construction phase of the project there would likely be an approximate 0.1 percent increase in the daily traffic volume on U.S. Highway 395.

The housing requirement for the construction work force would be met by rented RV park space, apartments or motel rooms (with or without kitchen facilities). Given the limited number of construction workers and the limited time which the construction workers would be in the local area, any impact caused by their entry into the housing market would be very small and short-term in nature. The permanent worker force would be hired principally from the existing local labor force; therefore, no appreciable impact to the housing market is anticipated from the Proposed Action.

5.1.13. Other Resources

The Proposed Action would have no impacts to; prime and unique farmland, floodplains, ACECs, wild and scenic rivers or areas of traditional Native American religious concern.

5.2. No Action Alternative

5.2.1. Mineral Resources

Under the No Action Alternative, none of the precious metals which would be produced under the Proposed Action would be mined, and the additional mineral resources would not be developed but remain for possible future development. All impacts to mineral resources associated with the existing permitted mining operations would continue to occur for the life of these projects.

5.2.2. Physiography and Geology

None of the impacts associated with the expanded mining operation and associated reclamation under the Proposed Action would occur under the No Action Alternative. This includes the historic surface disturbance that would have been consumed by the mining operations and reclaimed under the Proposed Action. However, all impacts to physiography and geologic resources associated with the existing permitted mining operations would continue to occur.

5.2.3. Soils

None of the impacts to the soil resources identified under the Proposed Action would occur under the No Action Alternative. However, all impacts to soil resources associated with the existing permitted mining operations would continue to occur.

5.2.4. Hydrology

5.2.4.1. Surface Water

None of the impacts to the surface water resources associated with the implementation of the Proposed Action would occur under the No Action Alternative. However, all impacts to surface water resources associated with the existing permitted mining operations would continue to occur.

5.2.4.2. Groundwater

None of the impacts to the groundwater resources associated with the implementation of the Proposed Action would occur under the No Action Alternative. However, RMC 's current consumption of an average of up to 400 gpm (576,000 gpd) of groundwater from the Fremont Valley would continue. As water consumption would be expected to decrease beginning in fiscal year 1997, these existing RMC operations would be expected to consume an average of approximately 190 gpm (273,600 gpd) for the remaining 6-year mine life. As described in Chapter 4, these impacts would result in approximately 1 foot of additional drawdown in the vicinity of the RCWD wells after six (6) years.

5.2.5. Air Quality

Under the No Action Alternative, none of the impacts to the air quality associated with the Proposed Action would occur. However, all impacts to air resources associated with the existing permitted mining operations would continue to occur for the life of these projects.

5.2.6. Vegetation and Range Resources

5.2.6.1. Vegetation Communities

Under the No Action Alternative, none of the impacts to the vegetation resources associated with the Proposed Action would occur. However, all impacts to vegetation resources associated with the existing permitted mining operations would continue to occur for the life of these projects.

5.2.6.2. Range Resources

Under the No Action Alternative, none of the impacts to range resources associated with the Proposed Action would occur. However, all impacts to ranges resources associated with the existing permitted mining operations would continue to occur for the life of these projects.

5.2.7. Wildlife Resources

Under the No Action Alternative, none of the impacts to wildlife resources associated with the Proposed Action, including proposed impact reduction measures to enhance desert tortoise habitat and the compensation for tortoise habitat reduction, would occur. However, all impacts to wildlife resources associated with the existing permitted mining operations, including tortoise habitat impact reduction and compensation measures, would continue to occur.

5.2.8. Cultural and Paleontological Resources

5.2.8.1. Cultural Resources

Under the No Action Alternative, none of the impacts to cultural resources associated with the Proposed Action would occur. However, all impacts to cultural resources associated with the existing permitted mining operations would occur or continue to occur.

5.2.8.2. Paleontological Resources

There would be no impacts to paleontological resources as a result of implementation of the No Action Alternative.

5.2.9. Visual Resources

Under the No Action Alternative, none of the impacts to visual resources associated with the Proposed Action would occur. This includes the potential incremental enhancement to the visual resources resulting from the reclamation of historic surface disturbance. However, all impacts to visual resources associated with the existing permitted mining operations would continue to occur.

5.2.10. Noise

Noise impacts resulting from activities associated with the Proposed Action would not occur under the No Action Alternative. However, all noise-related impacts associated with the existing permitted mining operations would continue to occur for the life of these projects.

5.2.11. Land Use and Wilderness

None of the land use classifications, road system, recreational or wilderness impacts associated with the implementation of the Proposed Action would occur under the No Action Alternative. However, all land use-related impacts associated with the existing permitted mining operations would continue to occur for the life of these projects.

5.2.12. Socioeconomics

Under the No Action Alternative, none of the socioeconomic impacts associated with the implementation of the Proposed Action would occur. This includes the approximately $60,000.00 annually in additional property taxes, $140,000.00 annually in additional electrical purchases, the additional eight (8) employees, and 21 secondary jobs, as well as not continuing the current level of expenditures ($17,600,000 annually) and employment (140 individuals) for the additional nine (9) to ten (10) years. However, all socioeconomic impacts associated with the existing permitted mining operations would continue to occur for the life of these projects.

5.2.13. Other Resources

The No Action Alternative would have no impacts to prime and unique farmland, floodplains, ACECs, wild and scenic rivers or areas of traditional Native American religious concern.

5.3. Agency Preferred Alternative

The BLM preferred alternative is the alternative which best fulfills the agency's statutory mission and responsibilities while giving consideration to economic, environmental, and technical concerns and other factors. The NEPA and CEQA environmentally superior alternative is the alternative that is determined to have the least adverse environmental effects, other than the No Action Alternative. The Proposed Action, as presented above, consists of several related components which are combined to describe the action. The preferred and environmentally superior alternative consists of the Proposed Action, including recommended mitigation measures as outlined in Chapter 6. The proposed mitigation measures would include; minimization of the amount of surface disturbance needed for project, as well as monitoring for, and mitigation of unexpected hydrologic effects due to implementation of the Proposed Action. The potential unavoidable effects to the environment associated with the Agency Preferred Alternative are discussed in Chapter 7. The Agency preferred Alternative would lessen impacts to the existing environment resulting from the Proposed Action and allow RMC to explore for and develop existing mineral resources.

CHAPTER 6
MITIGATION MEASURES FOR THE PROPOSED ACTION

6. MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental protection measures contained in the Proposed Action are incorporated by project design to mitigate possible impacts resulting from the implementation of the Proposed Action. These environmental protection measures contained in the Proposed Action have been considered in the analysis of the Proposed Action and alternatives and assessment of its impacts. The mitigation measures outlined in this chapter , were developed by the BLM and Kern County to prevent unnecessary and undue degradation of the lands in the project area of operations. These recommended mitigation measures are developed through both the NEPA process as required under 43 CFR 3809.2-1(a) and the CEQA process as required under 14 CCR 3652. These recommended mitigations, when adopted as part of the applicable permits would become stipulations that must be implemented in order to prevent unnecessary and undue degradation of the lands in the project area.

6.1. Mineral Resources

No recommended mitigation measures.

6.2. Physiography and Geology

No recommended mitigation measures.

6.3. Soils

A-1 Impacts to soils shall be mitigated by keeping surface disturbance to the minimum that is required to construct and operate the project.

A-2 The topsoil stockpile shall be designed to minimize wind and water erosion and shall not be disturbed until the commencement of reclamation activities, unless utilized for vegetation test plots. This shall include the creation of a low relief stockpile, which shall be seeded in the first year after stockpiling with a nitrogen-fixing species or used as test plot sites.

6.4. Hydrology

6.4.1. Surface Water

B-1 Roads shall be crowned and water bars shall be constructed to minimize erosion and sediment production.

B-2 Topsoil stockpiles shall be seeded with a nitrogen-fixing species or used as test plot sites to limit erosion.

B-3 An erosion and sedimentation plan shall be developed and shall be subject to review and approval by the BLM and Kern County in order to minimize sedimentation resulting from surface water impacts. No other mitigation measures are recommended.

6.4.2. Groundwater

C-1 If continued pumping from RMC's wells results in any unexpected indication of impacts to the pumping capabilities of the adjacent wells, then a program to monitor the existing wells in the area shall be implemented. The monitoring shall determine the appropriate corrective action plan, which shall then be implemented, as necessary.

6.5. Air Quality

D-1 Any disturbed surfaces no longer needed for project activities shall be reclaimed to minimize fugitive dust emissions.

D-2 All operations shall be conducted in compliance with permits granted by the KCAPCD including implementation of a program to minimize fugitive dust emissions through watering or dust palliatives. No other mitigation measures are recommended.

6.6. Vegetation and Range Resources

6.6.1. Vegetation Communities

E-1 To mitigate impacts to Joshua trees, RMC shall, after the non-articulated, less than 4-foot tall Joshua trees have been removed to either the existing or proposed topsoil stockpile areas, allow nurseries and other authorized individuals or groups into the project area to salvage all remaining Joshua trees which would otherwise be destroyed as a result of the construction activities. The BLM should notify the nurseries and others, and there shall be a reasonable period prior to the start of construction during which time the salvage operations could occur.

E-2 Monitoring and reporting of any previously undiscovered Red Rock Poppy populations shall be conducted in accordance with standard BLM procedures during the ongoing vegetation monitoring under the Proposed Reclamation Plan.

E-3 Proposed construction and operations shall utilize existing roads and already disturbed surfaces. No other mitigation measures are recommended.

6.6.2. Range Resources

No recommended mitigation measures.

6.7. Wildlife Resources

F-1 Impacts to wildlife habitat through surface disturbance associated with construction and operation of the project shall be minimized by disturbing only that area required to construct and operate the project.

F-2 Proposed construction and operations shall utilize existing roads and previously disturbed surfaces to the extent practical to minimize additional surface disturbance and associated wildlife habitat losses.

F-3 OHV traffic shall be restricted in the project area to minimize additional loss of wildlife habitat.

F-4 Measures to reduce potential impacts, as detailed in the Biological Opinion (Appendix L) resulting from the Proposed Action, both direct and indirect, to the desert tortoise and the Mohave ground squirrel have been incorporated by reference into the Proposed Action. However, the specific terms and conditions outlined in the 2081 Permit shall be implemented to minimize impacts to the desert tortoise. The three (3) shafts identified, in the 1993 Bat Survey, as active bat habitats which would not be directly affected by the Proposed Action shall be fenced to minimize human entrance into those shafts. Shafts identified, in the 1993 Bat Survey, as active bat habitats which would be directly affected by the Proposed Action shall be cleared of bats prior to the initiation of project activities.

F-5 All employees shall be responsible for reporting wildlife mortalities. Monitoring and notification of wildlife mortalities shall be submitted monthly to the Ridgecrest Resource Area Manager by the Environmental Affairs Supervisor. Reports shall include: month of report; project name (Yellow Aster, Lamont, Baltic, and Descarga); CAMC No.; number of deaths; date of death; wildlife group; location of death; cause of death; and identification by species of the wildlife found dead. Process operators shall have the prime responsibility for monitoring areas where cyanide is used. They shall inspect the areas in the course of normal duties. Any wildlife deaths shall be recorded on their daily report, noting place, date and time of death. Process operators and their supervisor shall report wildlife mortalities directly to the Environmental Affairs Supervisor. If any personnel other any the process operator and their supervisor discover a wildlife death, they shall notify their supervisor who shall in turn notify the Environmental Affairs Supervisor. All carcasses of endangered and threatened species, migratory birds, bats, and any other animals that are not confidently identified by RMC personnel shall be retrieved, placed in a plastic bag, and stored in a refrigerated area (not to exceed five (5) days) until identified by qualified personnel.

F-6 In order to immediately mitigate impacts relating to pooling/puddling of cyanide solution due to lack of percolation, measures to be taken shall include, but not be limited to, breaking of the heap leach surface with a shovel, pick or other such tools and/or graveling or cobbling of the pools and/or puddles. All waters that contain any chemical in solution at levels lethal to wildlife (e.g. barren and pregnant ponds) shall be covered or contained in a manner that shall preclude access by wildlife. All covers shall be maintained in a manner that shall continue to preclude access by wildlife as long as the pond can hold solution. Open collection channels which form at the margins of heaps and contain cyanide solution shall be covered to exclude wildlife.

F-7 Heap leach pads shall be inspected for rocks or other conditions which may be used by perching birds and the conditions shall be altered or the rocks removed from the area.

F-8 An alternative fresh water source shall be constructed for birds, which shall be located at least 100 yards from the heap leach pads and 100 yards from roads, in an area of little disturbance. The water source shall be situated at an elevation equal to or greater than the final lift of the heap leach pad. RMC shall consult with BLM regarding design and construction of the alternative fresh water source for wildlife.

F-9 Upon notification by the BLM, RMC shall provide access to the project by representatives of the BLM to periodically check on the status and efficacy of the wildlife protection measures.

6.8. Cultural and Paleontological Resources

6.8.1. Cultural Resources

G-1 There are no known National Historic Preservation Act (NHPA) eligible sites in the project area, therefore, no impacts to known cultural resources are expected. However, should unidentified cultural resources be discovered during project operations RMC shall notify the BLM and/or Kern County, depending upon whether the resources are located on public or private land, respectively.

6.8.2. Paleontological Resources

G-2 There are no known paleontological resources known to or expected to occur in the project area, therefore, no impacts to known paleontological resources are expected. However, should unidentified paleontological resources be discovered during project operations RMC shall notify the BLM and/or Kern County, depending upon whether the resources are located on public or private land, respectively.

6.9. Visual Resources

H-1 Lights used for mining and processing operations at night shall have reflectors or shields to eliminate or minimize fugitive light. No other mitigation measures are recommended.

6.10. Noise

I-1 Blasting activities shall be limited to daylight hours and coordinated between the Baltic, Yellow Aster, Lamont and satellite pits to avoid coincident blasts.

I-3 All heavy equipment, drilling rigs, and other internal combustion engines shall employ mufflers to minimize indirect impacts to sensitive noise receptors and wildlife from noise generated during construction, operation and reclamation activities.

I-4 RMC shall take appropriate measures to comply with the Kern County Noise Element of the County General Plan. No additional mitigation measures are recommended.

6.11. Land Use and Wilderness

No recommended mitigation measures.

6.12. Socioeconomics

No recommended mitigation measures.

6.13. Other Resources

No recommended mitigation measures.

CHAPTER 7
UNAVOIDABLE EFFECTS OF THE PROPOSED ACTION

7. UNAVOIDABLE EFFECTS OF THE PROPOSED ACTION

7.1. Mineral Resources

Unavoidable effects would be the permanent removal of 60 million tons of ore from the open pits.

7.2. Physiography and Geology

There would be an unavoidable effect to the physiography from the permanent change in the topography by the creation of the open pits, waste rock stockpiles and heap leach piles.

7.3. Soils

There would be an unavoidable effect to the soils after mitigation because there would be some erosion of the soils that would still occur, and only the upper portion of the soil profile would be stockpiled while the lower portion would be buried under the waste rock stockpiles and heap leach piles.

7.4. Hydrology

7.4.1. Surface Water

There would be an unavoidable effect to surface water after mitigation because some sedimentation during major storm events would still be possible.

7.4.2. Groundwater

An unavoidable effect to groundwater after mitigation would be the consumption of the groundwater resources used by the Rand Project.

7.5. Air Quality

Unavoidable effects to air quality after mitigation are a continuation of fugitive dust emission from the present level of operations and a minimal increase in fugitive dust emissions from mining operations, hydrocarbon and combustion emissions from internal combustion engines, and air toxics from all sources during the life of these operations.

7.6. Vegetation and Range Resources

7.6.1. Vegetation Communities

Unavoidable effects to vegetation resources would be the incremental short-term loss of vegetation from 511 acres disturbed during mine development and operation. Unavoidable effects would also occur from the long-term loss of vegetation from 132 of these 511 acres including the pit, highwall and other areas within the pits at the conclusion of the mine life.

7.6.2. Range Resources

Unavoidable effects to range resources would be the short-term loss of potential forage from 511 acres and the long-term loss of potential forage from 132 of these 511 acres.

7.7. Wildlife Resources

Unavoidable effects to wildlife resources would be the short-term direct loss of habitat from 511 acres and the long-term loss of habitat from 132 of these 511 acres, in addition, short-term indirect loss of habitat through avoidance of approximately 2,500 acres.

7.8. Cultural and Paleontological Resources

7.8.1. Cultural Resources

There are no known NHPA eligible sites in the project area, therefore, no unavoidable effects to cultural resources are expected.

7.8.2. Paleontological Resources

There are no unavoidable effects to paleontological resources.

7.9. Visual Resources

Unavoidable effects to visual resources would be a change in the visual character of the landscape by increasing the amount of mining-related landforms.

7.10. Noise

There are no noise-related long-term unavoidable effects.

7.11. Land Use and Wilderness

Unavoidable effects to recreational resources are short- and long-term restrictions on the recreational use of the area, which are consistent with federal and county land use planning for the area. There are no residual impacts to wilderness areas, proposed wilderness areas or WSAs.

7.12. Socioeconomics

Unavoidable effects to socioeconomics are mostly beneficial, such as additional taxes available for investment and improvements in the county, and increased spending by people associated with the project for the life of the mine.

7.13. Other Resources

There are no unavoidable effects to other resources.

CHAPTER 8
OTHER REQUIRED IMPACT CONSIDERATIONS

8. OTHER REQUIRED IMPACT CONSIDERATIONS

As required by the CEQA and to a certain degree NEPA, this chapter discusses specific impacts of the Proposed Action in ways not otherwise addressed in specific detail in Chapter 5, Environmental Consequences of the Proposed Action and Alternatives.

8.1. Unavoidable Adverse Impacts

Unavoidable adverse impacts which may result from the implementation of the Proposed Action include: the generation of dust, including air toxics, from project-related activities; the loss of vegetation and wildlife habitat in the project area; the destruction of identified and recorded cultural resources; the consumption of groundwater resources; the permanent alteration of the topography of the project area; and the potential reduction in the visual resources of the project area.

The fugitive dust generated by the project-related surface disturbance and rock moving activities would contribute to a slight decrease in the quality of the air resources in the air basin. Small quantities of toxic and potential carcinogenic elements and compounds contained in this dust and from other project-related sources could lead to an increase of 4.34 excess cases of cancer per one (1) million population from the estimated maximum cancer risk of 2.9×10^{-6}, or 2.9 additional cases per one (1) million population, from pre-project emissions, to a maximum cancer risk of 7.24×10^{-6}, or 7.24 excess cases of cancer per one (1) million population, from the implementation of the Proposed Action. However, the excess cancer risk from RMC operations, either existing or including the Proposed Action, are still far below the level which is defined by the Kern County Air Pollution Control District (KCAPCD) as significant, and would be expected to have minimal impact on the population areas immediately surrounding the project area. Dust suppression measures would be implemented to minimize these impacts. Mitigation measures to control impacts to air quality would be required of the project by the KCAPCD.

Project-related activities would remove vegetation and disturb the surface of 511 acres, which would also eliminate wildlife habitat from this disturbed area. This impact would continue for the duration of the project until reclamation was complete.

Mitigation measures would be required of the project by the BLM, USFWS, CDFG and Kern County to minimize impacts to protected species.

Seventy-four (74) of the 213 identified and recorded historic cultural sites would be disturbed by the Proposed Action. This would be an adverse impact to those recorded sites. The BLM and the State Historic Preservation Office (SHPO) have determined that the identification existing recordation of each of these sites is sufficient mitigation.

Approximately 556 afpy of groundwater over ten (10) years (approximately 5,560 acre-feet total) would be consumed by the pumping of groundwater from the existing Fremont Valley RMC wells for the Rand Project. This would be an unavoidable adverse impact to groundwater resource. However, over time the water table drawdown in the vicinity of RMC wells would recover.

The topography would be permanently altered by the construction of the open pits, waste rock stockpiles and leach pads in the project area. This would create an unavoidable adverse impact to the topography of the area. In addition, this change in the topography would have an adverse impact on the visual resources of the area.

8.2. Irreversible and Irretrievable Commitment of Resources

The only appreciable irreversible or irretrievable commitments of resources would be to the topography, biological resources, cultural resources, groundwater resources, and mineral resources. The topography would be permanently altered by the placement of the open pits, waste rock stockpiles and leach pads in the project area. Wildlife habitat, including that for the desert tortoise and the Mohave ground squirrel, may be permanently lost, although implementation of proposed impact reduction measures and compensation should result in the net increase of protected habitat. Seventy-four (74) cultural resource sites in the project area would be directly impacted; however, those resources have been recorded during previous field investigations or the mitigating treatment plan and all research value will have been recovered. There would be a net consumption of groundwater resources, but only for the life of the project. The removal of ore from the open pits would be an irreversible commitment of geologic and mineral resources.

8.3. Relationship Between Local Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity

The principal land uses in the project area have been established by past activities and are defined in the FLPMA as mineral exploration and production, outdoor recreation, wildlife habitat and grazing. The Proposed Action would commit an additional approximate 511 acres of the 2,520-acre project area to a single land use for approximately nine (9) to ten (10) years, during the operation of the mine. The reminder of the project area would be fenced, but would continue to be available for wildlife habitat, exclusive of the desert tortoise. Recreation opportunities would be reduced by the closure of the roads and routes through the project area.

Upon completion of the mining activities, the project area would be reclaimed and the existing land uses would be re-established over a majority of the project area. The length of time for successful reclamation may be greater than ten (10) years. Although the expanded portion of the open pits, which cover approximately 132 acres, would be reclaimed to a level that minimized potential risk to health and safety, it would not re-establish grazing, original wildlife habitat, or recreational land uses in the area of the open pits. The pits would, however, remain accessible for future mineral development and selective wildlife habitat.

The project proponent believes that the Proposed Action is justified at this time because of the economic and social benefits generated by the project. Total RMC project employment for the existing and proposed operations (148 individuals and a $6,000,000.00 annual payroll), secondary employment (394 individuals), direct expenditures and indirect expenditures ($10,800,000.00 annually), electrical power purchases ($740,000.00 annually) and property tax ($260,000.00 annually) would contribute to the viability of the local and regional economy for an additional nine (9) to ten (10) years beyond the current permitted operations with the approval of the Proposed Action, which would result in the mine operating for approximately 12 years, or until approximately 2006. The development of the mineral resources is in the national interest to satisfy industrial and security needs. In providing these benefits, the project would not preclude the long-term use of a majority of the project area for other principal land uses.

8.4. Growth-Inducing Effects of the Proposed Action

It is expected that the growth-inducing effects of the Proposed Action would be limited to the housing demand for employees and secondary economic growth from expenditures by the project proponent and its employees. The Proposed Action would provide continued direct employment for approximately 140 people and the new employment of eight (8) people for the nine (9) to ten (10) year life of the mine, which would result in the mine operating for approximately 12 years, or until approximately 2006. Secondary employment resulting from the combination of the existing and new employment is anticipated to be approximately 394 people. It is anticipated that most of the new employees (approximately eight (8) individuals) would come from the existing labor market in the region. It is believed that the existing and planned residential areas in Ridgecrest, the Rand Communities, California City and Mojave are adequate to meet the needs of employee housing. The expenditures by the project proponent and its employees would create some secondary (indirect) employment in the retail and services sectors, but it is expected these positions would continue to be filled from the existing labor market in the region.

8.5. Energy Consumption and Conservation

Construction and operation of the Proposed Action would result in the consumption of non-renewable energy resources. These resources would primarily include petroleum products, such as diesel fuel, gasoline, propane, and electricity. Fuel consumption by heavy equipment would be the largest single energy requirement. One of the primary opportunities for energy conservation would be regular, scheduled maintenance of the vehicles and equipment to maximize fuel efficiency. The Proposed Action has been designed for operational efficiencies, including minimizing haul road length to reduce fuel consumption. In addition, the project proponent encourages carpooling by project employees to reduce gasoline consumption.

CHAPTER 9
CUMULATIVE IMPACTS

9. CUMULATIVE IMPACTS

9.1. Introduction

As required under NEPA and CEQA, this chapter describes and analyzes the potential incremental increase in cumulative environmental impacts on the environmental resources in the northeastern Rand Mountains area which could result from the implementation of the Proposed Action. Cumulative impacts are defined under Federal regulations as:

> "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7).

The State of California CEQA guidelines define cumulative impacts as:

> "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. The individual effects may be changes resulting from a single project or a number of separate projects. The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probably future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time" (14 CCR 15355).

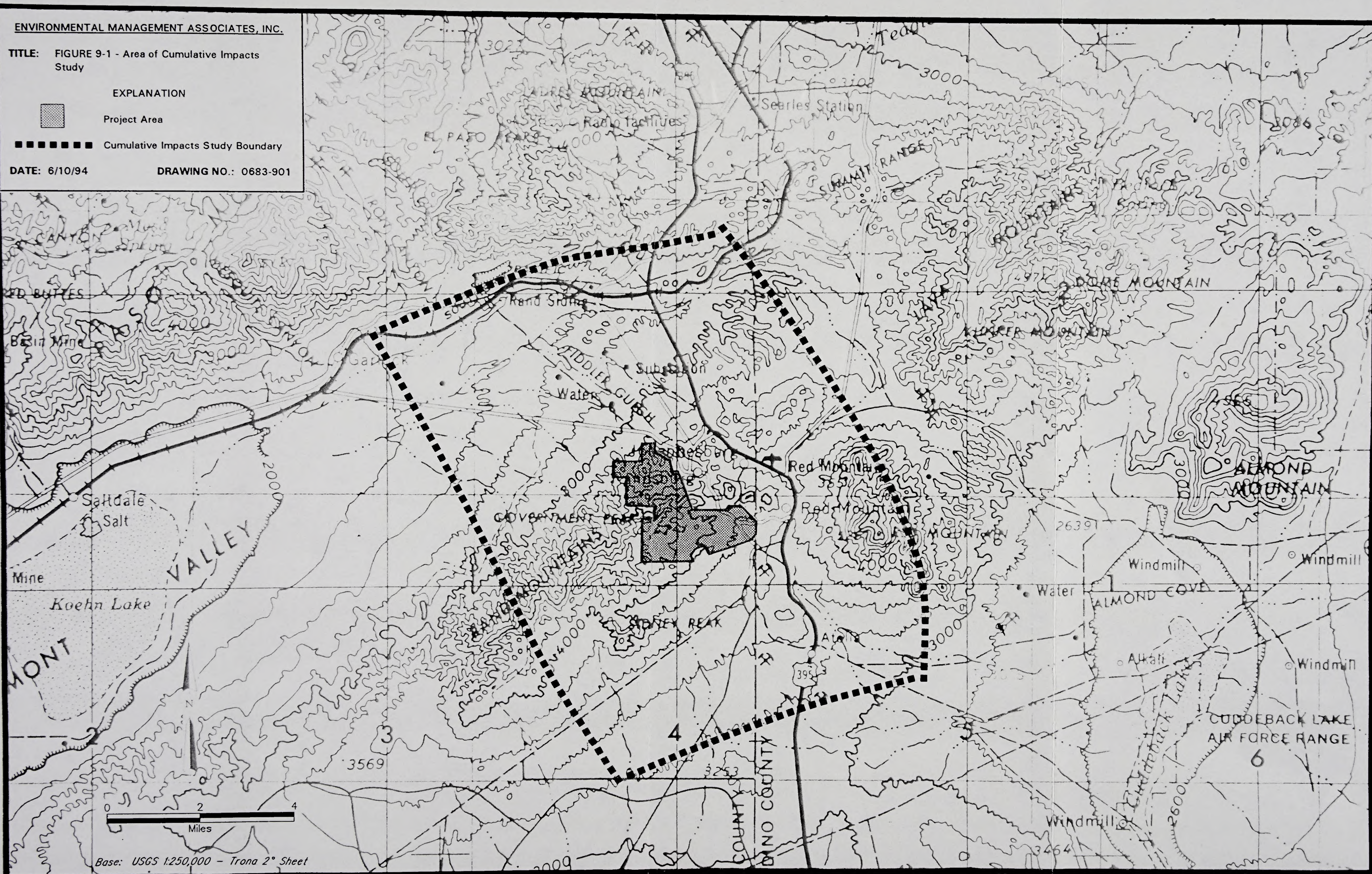
The geographical area considered for the analysis of cumulative impacts usually varies in size and shape to reflect each environmental resource that is evaluated. The specific resources of concern which have been cumulatively impacted and/or would be cumulatively impacted by the Rand Project have been identified as: physiography (surface disturbance); hydrology (groundwater); air quality; and biology (wildlife). For this cumulative impact analysis, these resources can be adequately evaluated using a single study area which includes the northeastern Rand Mountains, the northeastern portion of Fremont Valley and the northwestern portion of the Cuddeback Lake basin (Figure 9-1). The foreseeable future scenario (see Section 9.4) has been developed by Kern County and the BLM, and includes the activities of the mining and livestock industries and OHV use, all of which have the potential to impact the environmental resources of concern within the area of cumulative impacts analysis. The reasonably foreseeable future analysis for this EIS/EIR was evaluated for a 15-year time frame, which was based on a reasonable estimation of the potential future mine life of the Rand Project.

The BLM has completed the analysis required under NEPA for the Yellow Aster Mine Expansion Project (Yellow Aster) (EA-065-90-116) and approved the project as defined in the proposed action portion of the Yellow Aster EA (USDI, 1990b; pages 11 through 20). In addition, Kern County and the BLM have completed the Baltic Mine Project EIS/EIR (EIS-065-91-047; State Clearinghouse Number 91052039) and approved the project as defined in the proposed action portion of the Baltic Mine Project EIS/EIR (USDI, 1992; pages 2-1 through 2-47). This chapter of the Rand Project EIS/EIR incorporates by reference the analysis of the cumulative impacts in the Baltic Mine Project EIS/EIR (USDI, 1992; Pages 6-1 through 6-22) and reassesses the existing, proposed, and reasonably foreseeable future scenario provided in the Baltic Mine Project EIS/EIR (USDI, 1992; page 6-10 through 6-16) and whatever incremental increase would be associated with impacts from the Proposed Action.

9.2. Existing Activities in the Area of Cumulative Analysis

Mining, livestock operations and OHV use are ongoing in the northeastern Rand Mountains area. Livestock operations are conducted by 15 permittees who graze sheep on the Cantil Common Ephemeral Allotment, which comprises the entire cumulative impacts area (Figure 4-6). Mineral exploration and development activities are conducted by RMC, other companies, and individuals. OHV use of the area is high, and is conducted both by individuals and private associations (Keeller, 1993).

Mineral exploration and development has been a use of the area for the past 100 years. Figure 4-2 shows the location of the historic mine shafts and major historic

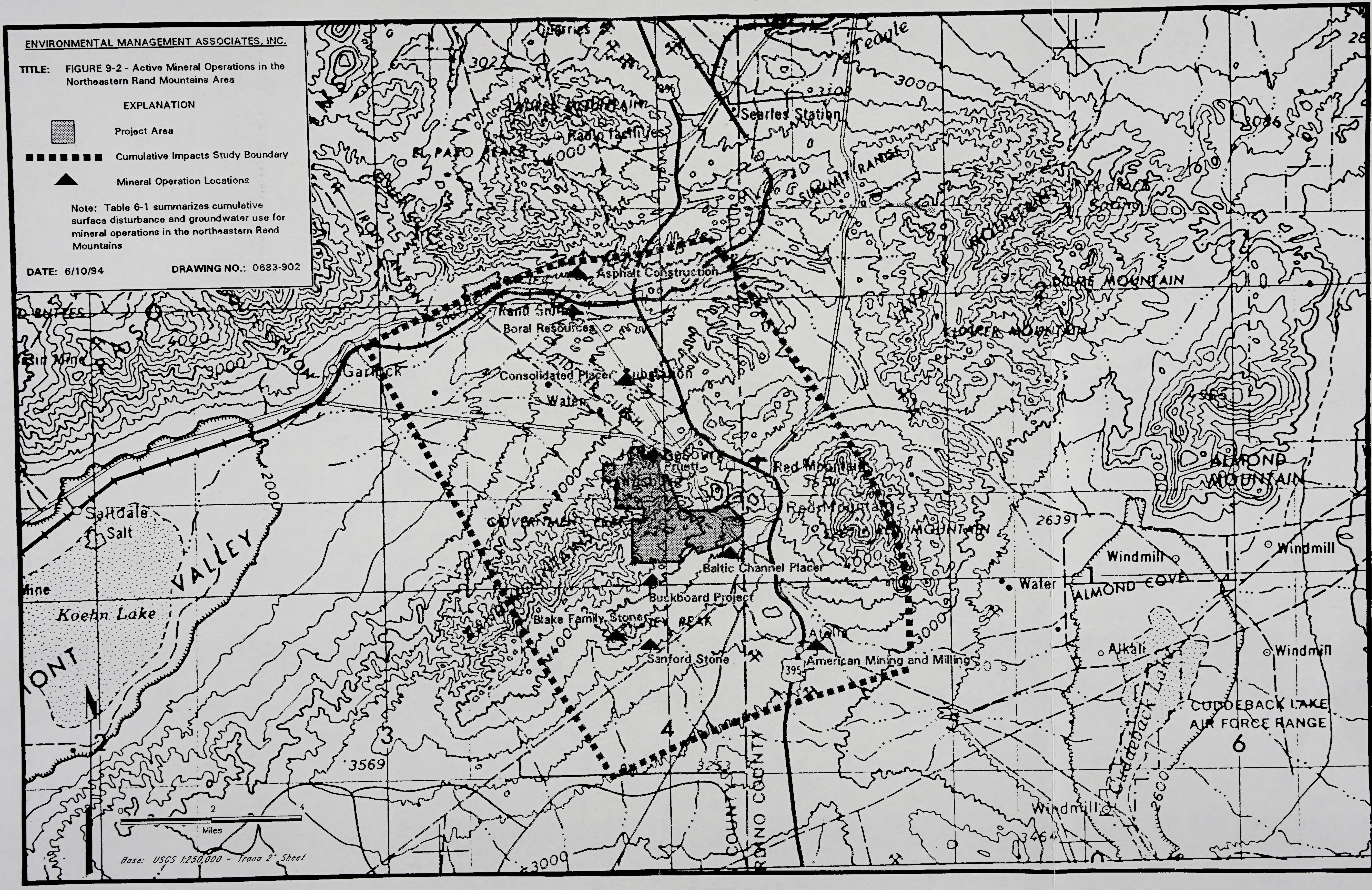

ENVIRONMENTAL MANAGEMENT ASSOCIATES, INC.
TITLE: FIGURE 9-1 - Area of Cumulative Impacts Study
EXPLANATION
Project Area
Cumulative Impacts Study Boundary
DATE: 6/10/94
DRAWING NO.: 0683-901
Searles Station
SUMMIT RANGE
Rand Siding
Substation
Water
Red Mountain
RED MOUNTAIN
GOVERNMENT PEAK
RAND MOUNTAINS
SIDNEY PEAK
Atolia
395
DOBLE MOUNTAIN
KLINKER MOUNTAIN
ALMOND MOUNTAIN
ALMOND COVE
Windmill
Alkali
CUDDEBACK LAKE AIR FORCE RANGE
Saltdale
Salt
Mine
Koehn Lake
VALLEY
RED BUTTES
Radio facilities
EL PASO PEAKS
3
4
5
6
0
2
4
Miles
Base: USGS 1:250,000 - Trona 2° Sheet

mining operations. The majority of the recent precious metals mining activities in the northeastern Rand Mountains have been conducted by RMC; this includes both ongoing mining and exploration activities. In addition to RMCs operations, Brenna Resources is currently conducting development stage drilling at the Buckboard property under a Notice of Intent (NOI), and Consolidated Placer controls a permitted placer mine operation. Other mineral commodities being produced within the cumulative impacts study area include flagstone and gravel. Currently there are two (2) flagstone operations, two (2) gravel operations and one (1) mine waste reprocessing operation within the cumulative analysis area (Denney, 1993). Other federal mining claims have been filed in the northeastern Rand Mountains area, but at present these claims are maintained by completing the minimal annual assessment work and/or fee requirements. Figure 9-2 shows the locations for the existing, proposed, and reasonably foreseeable future mining operations.

9.2.1. Rand Mining Company Operations

RMC currently operates several approved precious metal, heap-leach mining operations in the northeastern Rand Mountains south of the town of Randsburg. These operations are located within close proximity to each other and include: the Yellow Aster Mine; the Lamont Mine; the Baltic Mine; and the Descarga Operations. The main facilities associated with these operations consist of open pits, waste rock stockpiles, heap leach pads, and process plants. Figure 2-1 shows, in more detail, the locations of specific components of RMC's existing mining operations. The total permitted acreage of disturbance for these RMC operations is approximately 761 acres. All of RMC's current operations are located within the proposed Rand Project area. These operations are planned to continue for the next six (6) years.

Open pits have been developed at the Yellow Aster, Baltic, and Lamont Mine sites. Both ore and waste rock are mined at a combined average rate of approximately 45,000 tpd. The total approved disturbance for the development of these pits is approximately 193 acres. The material mined from the pits is segregated into waste and ore and transported to the nearest waste rock stockpile or heap leach process site.


ENVIRONMENTAL MANAGEMENT ASSOCIATES, INC.
TITLE: FIGURE 9-2 - Active Mineral Operations in the Northeastern Rand Mountains Area
EXPLANATION
Project Area
Cumulative Impacts Study Boundary
Mineral Operation Locations
Note: Table 6-1 summarizes cumulative surface disturbance and groundwater use for mineral operations in the northeastern Rand Mountains
DATE: 6/10/94
DRAWING NO.: 0683-902
Quarries
Searles Station
Radio facilities
SUMMIT RANGE
Asphalt Construction
Boral Resources
Consolidated Placer
Garlock
Water
Pruett
Red Mountain
Baltic Channel Placer
Buckboard Project
Blake Family Stone
Sanford Stone
Atolia
American Mining and Milling
Saltdale
Salt
VALLEY
Koehn Lake
ALMOND MOUNTAIN
Windmill
Water
ALMOND COVE
Alkali
CUDDEBACK LAKE AIR FORCE RANGE
3569
3253
2639
3000
4000
Miles
0 2 4
Base: USGS 1:250,000 - Trona 2° Sheet

The current operations utilize three (3) waste rock storage sites. Run-of-mine ore is placed directly on the heap leach pads. RMC currently operates three (3) heap leach and process plant facilities. These are located at the Yellow Aster, Baltic and Descarga sites. The heap leach facilities are designed to process the ore recovered from each open pit operation with the exception of Descarga. The Descarga process facility is designed as a test leach facility for materials from the Randsburg area and mine waste from the historic Yellow Aster mining operations. Process and dust control water consumption for the project operations, supplied from project wells, is at an average of approximately 645 afpy. As water consumption would be expected to decrease beginning in fiscal year 1997, these existing RMC operations would be expected to consume an average of approximately 305 afpy for the remaining 6-year mine life.

9.2.2. Flagstone Mining Operations

Randsburg Schist flagstone is currently mined from two (2) locations in the area (Figure 9-2). Flagstone is used as a decorative rock for fireplaces, walkways, pools, homes and buildings. The operations consist of open pit quarrying and sorting of the material for shipment. Operations are conducted on both private and federal lands, with the federal land being used under non-competitive salable mineral contracts with the BLM. These two (2) operations are controlled by two (2) separate owners; the Sanford Stone Company and the Blake family.

The Sanford Stone Company mine site is located in the NE¼ of Section 22, Township 30 South, Range 40 East, on a combination of both federal lands and private lands (the private lands consisting of a 20-acre patented claim block) (Figure 9-2). The mine site is a full-time operation that employs approximately 20 people. Total production is approximately 10,000 tons per year (tpy) and the approved surface disturbance is 186 acres, of which eight (8) acres have been reclaimed (Denney, 1993).

The Blake Family Stone Company flagstone operation is located in the SE¼ of Section 16, Township 30 North, Range 40 East, and encompasses entirely private land. This operation produces approximately 5,000 to 10,000 tpy and the permitted surface disturbance is 81 acres (Denney, 1993).

Water consumption for both the flagstone operations is estimated to be one (1) afpy (1,000 gpd) each and is used primarily for road dust control (Denney, 1993). The water is trucked to the mine sites from an off-site source and, as such, is not considered an impact to the groundwater resources of the cumulative impacts study area.

9.2.3. Other Mining Operations

Other currently active mining operations in the cumulative analysis area include two (2) gravel pit operations: 1) the Boral Resources gravel pit operation located in the Fremont Valley in SE¼ of Section 9, Township 29 South, Range 40 East; and 2) the CUP for the Asphalt Construction sand and gravel operation located in N½ of Section 9, Township 29 South, Range 40 East (Figure 9-2). The Boral Resources facility is located on private land and is currently permitted for 70 acres of surface disturbance. The gravel produced from the mine is used for local construction projects (Denney, 1993). This operation employs approximately ten (10) people and consumes approximately 34 afpy of water from a well located in the NE 1/4 of Section 21, Township 29 South, Range 40 East (see Figure 4-5) (Barker, 1993). Asphalt Construction is currently in the process of obtaining a permit for their operating, but currently unpermitted, sand and gravel facility. Current surface disturbance is approximately 45 acres. The operation consumes approximately one (1) afpy (1,000 gpd) of water which is trucked to the site from an off-site source (Denney, 1993). This trucked-in water is not considered an impact to the groundwater resources of the cumulative impacts study area.

Consolidated Placer Dredging (CPD) currently controls a permitted placer gold mining project on private land located in Section 22, Township 29 South, Range 40 East. At this time, the placer mine is in operation and the area of permitted disturbance encompasses 50 acres (Denney, 1993). A hydrologic study conducted for the operation indicates that the required water use will be 245 afpy which will be supplied from three (3) of the four (4) existing on-site wells (see

Figure 4-5) (Gnekow, 1993). This use is anticipated to continue through 1999 (Hargis + Associates, 1994).

American Minerals Management currently controls a mine waste reprocessing property located in Section 20, Township 29 South, Range 41 East near the town of Atolia. The operation at one time consisted of the removal of mine tailings from the Kelley Mine for reprocessing at the Atolia Mill site. The mine operation was active prior to 1976, the passage of SMARA, and the promulgation of accompanying regulations. Currently the operation has an unknown status. San Bernardino County Planning Department indicates that a Conditional Use Permit was never issued for the project and no information regarding acres of disturbance or water use is available in the files (Rush, 1993). Given that reprocessing of tailings did occur at the mine and mill sites, it is reasonable to estimate approximately ten (10) acres of disturbance to be associated with these activities. As the mining operation is currently inactive, it is assumed that there is no consumptive use of water at the site.

9.2.4. Exploration

RMC is currently conducting exploration activities at various locations in the general vicinity of the Rand Project, as well as in the northeastern Rand Mountains area. The acres of permitted disturbance for exploration within the Rand Project area are included in the disturbance calculations for the existing RMC operations. RMC's exploration disturbance outside the current approved areas of operations, within the northeastern Rand Mountains area, is approximately five (5) acres. In addition to the RMC exploration activities, Brenna Resources is currently conducting development stage drilling at the Buckboard precious metal property. Current exploration disturbance for this project is estimated to be five (5) acres. No other permitted surface disturbance exploration activities are currently ongoing in the northeastern Rand Mountains area.

9.2.5. Livestock Operations

Existing actual use in the Cantil Common Ephemeral Allotment ranges from 0 AUMs (animal unit months) to an historic average of 8,435 AUMs (USDI, 1980). Recent forage production has been relatively low, at approximately 600 to 1,000 lbs/acre, due to the drought conditions which were prevalent in the area for the past several years. As discussed in Section 4.6.2, in order to protect desert tortoise habitat, the Rand Mountains and Fremont Valley portions of the Cantil Common Ephemeral Allotment are currently withdrawn from grazing.

The BLM is presently in consultation with the USFWS regarding the future protection of the desert tortoise habitat in the Cantil Common Ephemeral Allotment. Much of the allotment is considered Class 1 tortoise habitat, or land that is in the best condition to support desert tortoises. The Rand Project area itself is considered Unclassified or Class 3 tortoise habitat, or land that is in the poorest condition to support desert tortoises (Rado, 1993b).

9.2.6. Off-Highway Vehicle Use

The current level of OHV use in the area is discussed in Section 4.11.3, and generally consists of casual use and organized events typically sponsored by the American Motorcycle Club. The surface disturbance associated with existing roads currently available to OHV use comprises approximately 120 acres. The existing roads evaluated for this acreage calculation include both the BLM routes that are proposed to be maintained under the RMFVMA Plan and the routes that are proposed to be closed under that plan, as well as routes outside the RMFVMA.

9.2.7. Irrigation Wells

A total of six (6) irrigation wells are present in the northeastern portion of the Fremont Valley, which cumulatively produce approximately 5,000 gpm (7,200,000 gpd). Currently, most of the production is from well 28H01, although production from individual wells may vary throughout the year (Hargis + Associates, 1994).

Collectively, these wells are the largest producers of groundwater within the study area.

9.3. Proposed Activities in the Area of Cumulative Analysis

9.3.1. Mining Operations

Proposed activities within the area of cumulative analysis include the Proposed Action, which is discussed in detail in Section 2.3; the Sanford Stone Company expansion; and the Asphalt Construction expansion. The Proposed Action would disturb a total of 511 acres, 132 acres of which would be associated with the expansion of the open pits. The average water consumption over the 16-year period of operations and reclamation would be approximately 440 afpy (see Appendix E).

The Sanford Stone Company currently has proposed to conduct flagstone mining operations at a reclaimed mine site located in the NW¼ of Section 21, Township 30 South, Range 40 East. This operation would disturb approximately 100 acres, but would result in no increase in existing water usage (Taylor, 1993). As part of the Asphalt Construction currently being processed for their existing sand and gravel operations, an expansion to this existing operation has also been proposed in the permit application. The proposal would expand the existing operations by 355 acres. No additional water consumption would be anticipated with this expansion.

9.3.2. Off-Highway Vehicle Use

Several changes to the existing routes for OHV use are proposed both in the RMC Proposed Action and the BLM's RMFVMA Plan. The RMFVMA Plan proposes to close the public access of approximately 70 acres of currently available off-road routes. RMC proposes to close off 2.5 acres of BLM Route 85 due to conflicts with proposed mining operations; however, in order to provide adequate alternative access, RMC also proposes to construct two (2) relocated access roads which will add approximately one (1) acre of disturbance (see

Figure 2-8 and Figure 4-10). In addition, the BLM will identify the location for the new portion of the loop road from the Government Peak area to the Randsburg area, around the Rand Project boundary, to be constructed under the BLM transportation plan. The location and size of this route has not yet been determined, but is anticipated to cover approximately 15 acres.

9.4. Foreseeable Future Operations

The 15-year time frame for the reasonably foreseeable future scenario is from 1995 through 2010. The operations predicted in this scenario are anticipated to commence within the 15-year time frame, and are to be completed by, or extend beyond, the year 2010. No reasonably foreseeable future actions are associated with the irrigation wells, other than continuation of the existing usage.

9.4.1. Mineral Exploration and Development

Given the number of active and inactive mining operations in the northeastern Rand Mountains area, coupled with the mineral exploration activities in the area, continued mineral-related activities can be anticipated for the foreseeable future. This is supported by the geology and identified ore reserves and mineralization in the area. Therefore, Kern County and the BLM have developed the following scenario for the purpose of ascertaining the cumulative environmental impacts in the northeastern Rand Mountains area in the reasonably foreseeable future.

9.4.1.1. Exploration

Surface disturbance of five (5) acres per year would occur due to continued mineral exploration in the northeastern Rand Mountains area. This equates to approximately 3 miles of new road each year, or 45 miles of road over a 15-year foreseeable future scenario. This scenario does not include the exploration activities under the Proposed Action.

9.4.1.2. Rand Project

RMC would continue assessment of its open pit reserves throughout the life of the mining operation. It is foreseeable that this assessment would identify additional ore reserves within the vicinity of the known pits which would require additional acreage to mine and process the ore. It is reasonable to expect that this scenario would include approximately 50 acres of disturbance associated with further expansions of the Yellow Aster, Baltic, Lamont and on-site satellite pits. To accommodate the produced ore from the on-site pit expansions and the development of foreseeable off-site satellite deposits, it is expected that the Descarga and Lamont Valley and Baltic heap leach pads will be expanded. The required heap leach expansions are expected to comprise 75 acres of disturbance. Waste rock would be accommodated by expanding the West Valley waste rock stockpile to the west and northwest and possibly expanding the Baltic waste rock stockpile on the north. Approximately 40 acres of disturbance is anticipated for these foreseeable waste rock stockpile expansions. Approximately an additional ten (10) afpy of water would be consumed as part of this expansion.

9.4.1.3. New Precious Metal Mine

It is foreseeable that a new precious metal open pit site could be developed at the site of the Buckboard Property, currently operated by Brenna Resources; however, both RMC and Brenna Resources presently hold mining claims in the area. The ore grade and size of the estimated Buckboard reserve indicates that the project would likely be developed as a satellite deposit to the RMC operations, utilizing RMC's processing facilities. The mine would develop new disturbance associated with an open pit, waste rock stockpile, and haul roads. Ore could be hauled to the closest RMC processing facility. These activities would produce an estimated surface disturbance area of 80 acres, of which 30 acres would be for the open pit, and consume an estimated five (5) afpy of water.

A placer gold resource, referred to as the Baltic Channel, has been identified in Section 12 and 13, Township 30 South, Range 40 East (Taylor, 1993), but is currently undeveloped. It is foreseeable that this site could be developed in the future; however, a significant portion of the channel is located within an area designated as withdrawn from mineral development under the RMFVMA Plan, which would restrict the possible development of the resource to an area within the north half of Section 12. In addition, the southern ¾ of Section 13, Township 30 South, Range 40 East has been preliminarily identified by the USFWS as critical habitat for desert tortoise, which also could significantly reduce development potential. Under these restrictions, it is estimated that the development of this resource within the area north of the center of Section 12 would produce 50 acres of disturbance, and consume an estimated 300 afpy of water.

9.4.1.4. Flagstone Mining Operations

It is foreseeable that flagstone operations would continue throughout the 15-year time frame; however, current market trends indicate a potential slow down in flagstone consumption. Given this scenario, it is reasonable to expect only a moderate expansion of existing flagstone operations.

It is foreseeable that the Pruett Family would develop a flagstone mining operation on patented ground northwest of the Rand Project area. The development of this new mine is estimated to encompass approximately 40 acres of new disturbance. Employment would be approximately two (2) people. Water consumption is estimated to be approximately one (1) afpy and would be supplied to the site by truck from an off-site source.

It is reasonable to expect that within the 15-year foreseeable future period the Sanford Stone Company would expand current and proposed flagstone mining operations. Production at this site would likely be as much as 10,000 tons/yr and would encompass up to 20 acres of new disturbance. No new employment or additional water consumption would be anticipated.

9.4.1.5. Other Mining Operations

It is foreseeable that the sand and gravel operations and the existing placer mining operation would continue throughout the 15-year time frame. It is reasonable to expect a moderate expansion of these existing operations.

It is reasonable to expect that within the 15-year foreseeable future period the Boral Resources facility would expand current operations. Surface disturbance as a result of this expansion would likely be 50 acres and water consumption would increase by 17 afpy. Asphalt Construction would likely expand the existing and proposed operations, which would increase surface disturbance by 100 acres. However, water would continue to be supplied from outside the area of cumulative impacts study. Consolidated Placer Dredging would likely expand the existing placer operation by 25 acres and increase water consumption by 75 afpy.

9.4.2. Grazing Management

As a result of the current consultation between the BLM and the USFWS regarding the protection of desert tortoise habitat, the BLM sees two (2) possible foreseeable future scenarios for grazing within the cumulative assessment area. The common allotment would either be closed to grazing for the foreseeable future, or the amount of permitted grazing would be significantly limited, so that only a very reduced number of sheep would be allowed to graze. If grazing is allowed to continue within the area of cumulative analysis, there would be some surface disturbance associated with transport and grazing of the sheep, and the sheep would consume a certain amount of forage. However, a decision has not been made by the BLM on the amount, if any, of permitted use that would occur within the area of cumulative analysis, and, therefore, a quantification of the foreseeable future impacts is not possible.

9.4.3. Off-Highway Vehicle Use

The intense use of the northeastern Rand Mountains area for OHV recreation will continue through the foreseeable future, particularly in the area around Randsburg. It is expected that there will be an increase in use because of the high percentage of unoccupied private land in the area and the unclassified nature of the interspersed public lands. This use will be slightly restricted on the private and public lands occupied by RMC's various operations. The OHV use in the area of cumulative analysis, particularly unrestricted use on unoccupied private land, would result in additional surface disturbance, which could be on the order of approximately three (3) acres per year.

9.5. Summary of Existing, Proposed and Reasonably Foreseeable Future Operations

Table 9-1 presents a summary of the existing, proposed, and reasonably foreseeable future disturbance acreage and water consumption within the cumulative impact study area. The total surface disturbance for listed existing activities in the area of cumulative analysis is approximately 1,325 acres, of which 193 acres are associated with open pits which will be reclaimed to the equivalent of the Level One reclamation guideline, including slope stabilization and limitation of public and wildlife access (see Section 2.3.7.1 for a discussion of reclamation levels). The total surface disturbance under proposed activities in the area of cumulative analysis is approximately 909.5 acres, of which 132 acres would be associated with open pits which will be reclaimed to the equivalent of the Level One reclamation guideline. The total surface disturbance under the reasonably foreseeable activities in the area of cumulative analysis is approximately 355 acres, of which 80 acres would be associated with open pits which will be reclaimed to the equivalent of the Level One reclamation guideline. Therefore, all listed existing, proposed, and reasonably foreseeable surface disturbance totals approximately 2,589.5 acres, of which 405 acres, consisting of 179 acres of public land and 226 acres of private land, would be associated with open pits which will be reclaimed to the equivalent of the Level One reclamation guideline.

Table 9-1: Summary of Surface Disturbance and Groundwater Consumption Under the Existing, Proposed and Reasonably Foreseeable Future Operations

SITE	DISTURBANCE (acres) TOTAL		DISTURBANCE (acres) OPEN PITS	TOTAL GROUNDWATER CONSUMPTION (acre-feet)[1] 1995 - 2009	AVERAGE ANNUAL GROUNDWATER CONSUMPTION (acre-feet)[1]
EXISTING OPERATIONS					
Rand Mining[1]	761.0		193.0	1,806.0	301.0
Consolidated Placer[2,3]	50.0		0.0	1,225.0	245.0
Sanford Stone[2]	178.0		0.0	0.0	0.0
Blake Family Stone[2]	81.0		0.0	0.0	0.0
Boral Resources[2]	70.0		0.0	510.0	34.0
Asphalt Construction[2]	45.0		0.0	0.0	0.0
American Minerals Management	10.0		0.0	0.0	0.0
Buckboard Project	5.0		0.0	0.0	0.0
RMC Exploration	5.0		0.0	0.0	0.0
Subtotal Existing Mining		1,205.0	193.0	3,541.0	580.0
Off-Highway Vehicle Use		120.0	0.0	0.0	0.0
Existing Agricultural Wells[4] (up to 6 wells)		0.0	0.0	101,325.0	6,755.0
Subtotal Existing Operations		1,325.0	193.0	104,866.0	7,335.0
PROPOSED ACTIVITIES					
Rand Project	511.0		132.0	7,041.0	440.0
Sanford Stone[2]	100.0		0.0	0.0	0.0
Asphalt Construction[2]	355.0		0.0	0.0	0.0
Subtotal Proposed Mining		966.0	132.0	7,041.0	440.0
Off-Highway Vehicle Use		-56.5	0.0	0.0	0.0
Subtotal Proposed Activities		909.5	132.0	7,041.0	440.0
REASONABLY FORESEEABLE FUTURE ACTIVITIES					
Rand Project	165.0		50.0	150.0	10.0
Buckboard Property	80.0		30.0	75.0	5.0
Baltic Channel Placer[2]	50.0		0.0	4,500.0	300.0
Pruett[2]	40.0		0.0	0.0	0.0
Sanford Stone[2]	20.0		0.0	0.0	0.0
Boral Resources[2]	50.0		0.0	255.0	17.0
Asphalt Construction[2]	100.0		0.0	0.0	0.0
Consolidated Placer[2]	25.0		0.0	1,125.0	75.0
Exploration Activities	75.0		0.0	0.0	0.0
Subtotal Reasonably Foreseeable Mining		310.0	80.0	6,105.0	407.0
Off-Highway Vehicle Use		45.0	0.0	0.0	0.0
Subtotal Foreseeable Activities		355.0	80.0	6,105.0	407.0
TOTALS		**2,589.5**	**405.0**	**118,012.0**	**8,182.0**

1 Water consumption for the existing RMC operations would continue for only six (6) years, not for the entire 15-year Reasonably Foreseeable Future Scenario time period.

2 Mine pits associated with these properties will be reclaimed, and/or are assumed to be reclaimed, at a minimum of the equivalent of the Level Two reclamation guideline (see Section 2.3.7.1), and therefore are not considered a long-term impact on the specific resources of concern.

3 Water consumption for the existing CPD operations would continue for only five (5) years, not for the entire 15-year Reasonably Foreseeable Future Scenario time period.

4 Consumption value for irrigation wells includes an estimated 16% aquifer recharge rate from re-infiltration.

The water consumption listed under existing activities in the area of cumulative analysis is approximately 7,335 afpy annual average and a total of 104,866 af over the 15-year reasonably foreseeable future scenario. The water consumption under proposed activities in the area of cumulative analysis is approximately 440 afpy annual average and a total of 7,041 af over the 15-year reasonably foreseeable future scenario. The additional water consumption due to reasonably foreseeable activities in the area of cumulative analysis is approximately 407 afpy annual average and a total of 6,105 af over the 15-year reasonably foreseeable future scenario. Therefore, all listed existing, proposed, and reasonably foreseeable water consumption totals approximately 8,182 afpy annual average and a total of 118,012 af over the 15-year reasonably foreseeable future scenario.

9.6. Evaluation of Potential Cumulative Impacts

Environmental consequences of the proposed Rand Project were evaluated in Chapter 5 for each environmental resource. Of the environmental resources evaluated in Chapter 5, only physiography, groundwater hydrology, air resources, and wildlife resources are considered to have the potential to be impacted to a degree that cumulative impact assessment of these resources is appropriate. Impacts to the other resources would not result in unavoidable adverse impacts that could be cumulatively important and are not evaluated in this chapter of the EIS/EIR.

9.6.1. Physiography

There is a cumulative impact to the physiography of the northeastern Rand Mountains area resulting from the total number of existing mining operations, exploration drill road construction and OHV use, which are summarized in Section 9.2. The total amount of surface disturbance resulting from the Proposed Action, which is outlined in Section 2.3, and the other activities in the area and the foreseeable future activities, which are outlined in Sections 9.3 and 9.4, is approximately 2,589.5 acres. The open pits, waste rock stockpiles and heap leach pads represent a permanent change to the physiography of the area. However, the waste rock stockpiles and leach pads will be partially recontoured and reclaimed to minimize the impact to the physiography. The roads and other facilities associated with mining operations will be reclaimed, thus creating only a temporary change to the physiography of the area. The Proposed Action would create approximately 511 acres of surface disturbance, which is 19.7 percent of the total topography disturbed under the cumulative impact assessment in this Chapter.

9.6.2. Groundwater Hydrology

There is a cumulative impact to the groundwater hydrology of the northeast Fremont Valley area resulting from the Rand Project and existing groundwater production wells associated with mining operations, water districts and agricultural use, which are summarized in Section 9.2. The total amount of groundwater use resulting from the Proposed Action, which is outlined in Section 2.3, and the other activities in the area and the foreseeable future activities, which are outlined in Sections 9.3 and 9.4, is approximately 8,182 afpy annual average or 118,012 af over the 15-year reasonably foreseeable future scenario. The Proposed Action would result in an increase in groundwater use of approximately 440 afpy, averaged over the approximate 16-year life of the proposed activities, which is 5.4 percent of the total groundwater consumed on an annual basis for the first six (6) years of the Reasonably Foreseeable Future Scenario, and 5.6 percent of the total groundwater consumption on an annual basis for the remaining nine (9) years of the Reasonably Foreseeable Future Scenario after the existing RMC operations cease.

As previously described in Chapters 4 and 5, groundwater modeling was performed to evaluate the impact of the Rand Project on groundwater conditions and vegetation in the northern Fremont Valley in general, and the RCWD wells in particular. Modeling Case 4 evaluated the total impacts to the aquifer from the proposed Rand Project pumpage, including existing wells within the cumulative impact study area (Table 9-2). In addition to the Rand Project groundwater production, the major water producers included in the modeling runs were the two (2) RCWD wells, three (3) CPD wells, and six (6) agricultural/irrigation wells in the southwest portion of the cumulative area, which, after subtracting recharge of excess irrigation water, consume an average of 4,188 gpm (Hargis + Associates, 1994).

Table 9-2: Results of Northern Fremont Valley Groundwater Modeling - Case 4

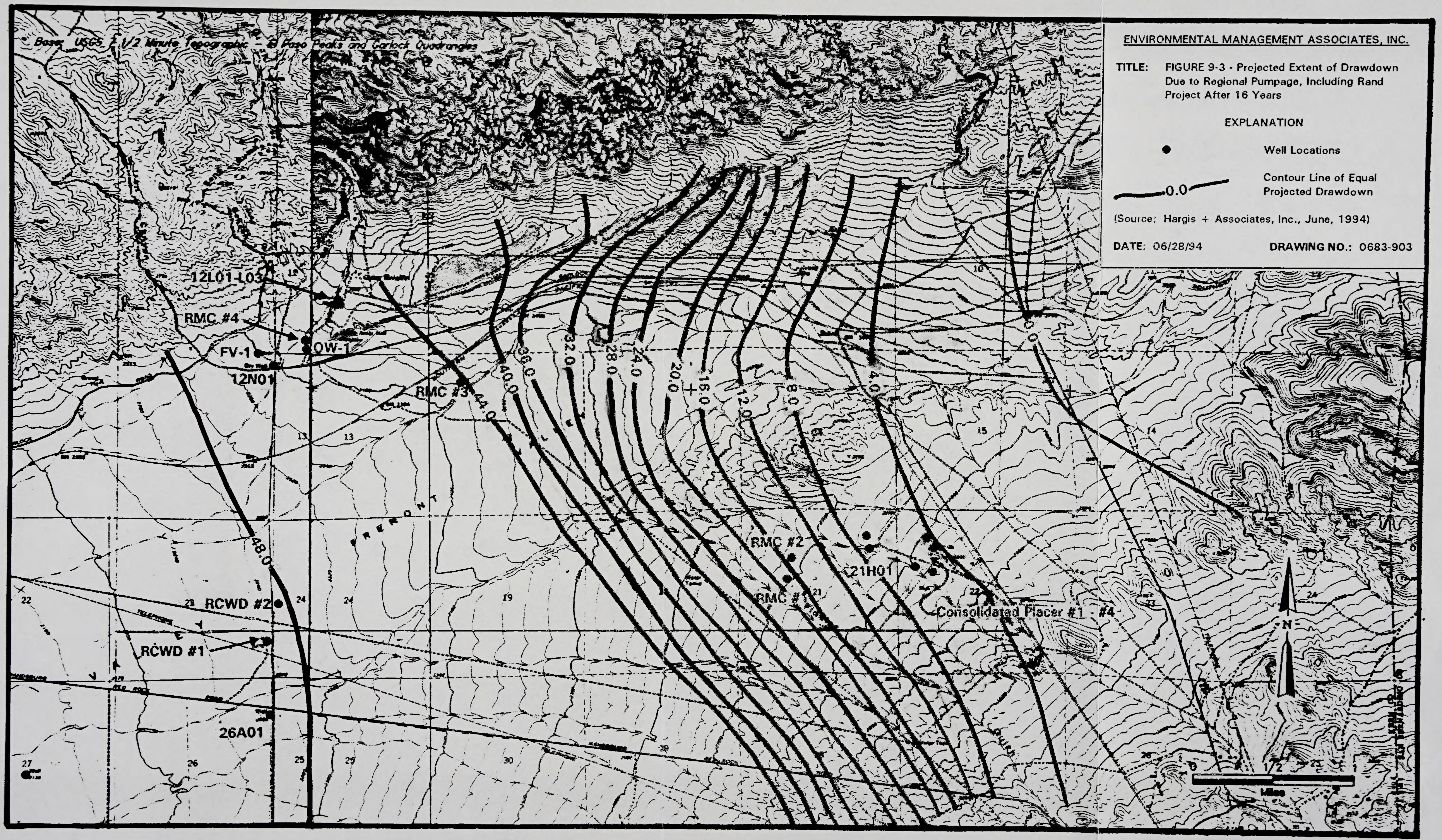
Model Run	Drawdown in the vicinity of RMC-4 (feet)			Drawdown in the vicinity of RCWD Wells (feet)		
	6 yr	12 yr	16 yr	6 yr	12 yr	16 yr
Case 4 - Proposed Rand Production and regional wells	39.2	50.6	47.1	27.1	43.6	48.4

[1] Hargis & Associates, Inc., June, 1994

Results of the modeling indicate that drawdown in the vicinity of the RCWD wells, including the influence of the all modeled groundwater withdrawals (Case 4), would amount to 47.1 feet at RMC well #4 after 16 years, and 48.4 feet at the RCWD wells after 16 years. Of these totals, the effect of the Rand Project water pumpage by itself is only 5.4 feet in the vicinity of RMC well #4, and 4.0 feet at the RCWD wells (see Figure 9-3).

Based on a comparison of the MODFLOW model results from Cases 3 and 4, the increased drawdown due to the Rand Project pumpage is similar whether only production well RMC #4 was included or whether all regional pumpage was included (Hargis + Associates, 1994). In the vicinity of the RCWD wells, approximately 3.4 feet of additional water level decline is projected after six (6) years of pumping for the Rand Project, while after 16 years of pumping for the Rand Project approximately 4.0 feet of additional water level decline was calculated. Actual drawdown may be higher due to well design inefficiencies or conditions such as incrusting (mineral deposits) on the well screen.

The impact on other valley wells was also calculated during the modeling. Drawdowns in the vicinity of the agricultural wells were 54.6 feet after 16 years, of which 2.8 feet of drawdown could be attributed to the Rand Project pumpage. Drawdown in the vicinity of Koehn Lake and the CPD wells was calculated at 34.0 feet and 4.9 feet respectively, of which 2.0 feet and 0.5 feet respectively, could be


ENVIRONMENTAL MANAGEMENT ASSOCIATES, INC.
TITLE: FIGURE 9-3 - Projected Extent of Drawdown Due to Regional Pumpage, Including Rand Project After 16 Years
EXPLANATION
Well Locations
0.0
Contour Line of Equal Projected Drawdown
(Source: Hargis + Associates, Inc., June, 1994)
DATE: 06/28/94
DRAWING NO.: 0683-903
Base: USGS 7 1/2 Minute Topographic – El Paso Peaks and Garlock Quadrangles
12L01-L03
RMC #4
FV-1
OW-1
12N01
RMC #3
RMC #2
21H01
RMC #1
Consolidated Placer #1 - #4
RCWD #2
RCWD #1
26A01
48.0
44.0
40.0
36.0
32.0
28.0
24.0
20.0
16.0
12.0
8.0
4.0
0.0
FREMONT
N
Miles

attributed to the Rand Project pumpage. The estimated water table elevations after 16 years of regional pumpage, including the Rand Project, are shown on Figure 9-4.

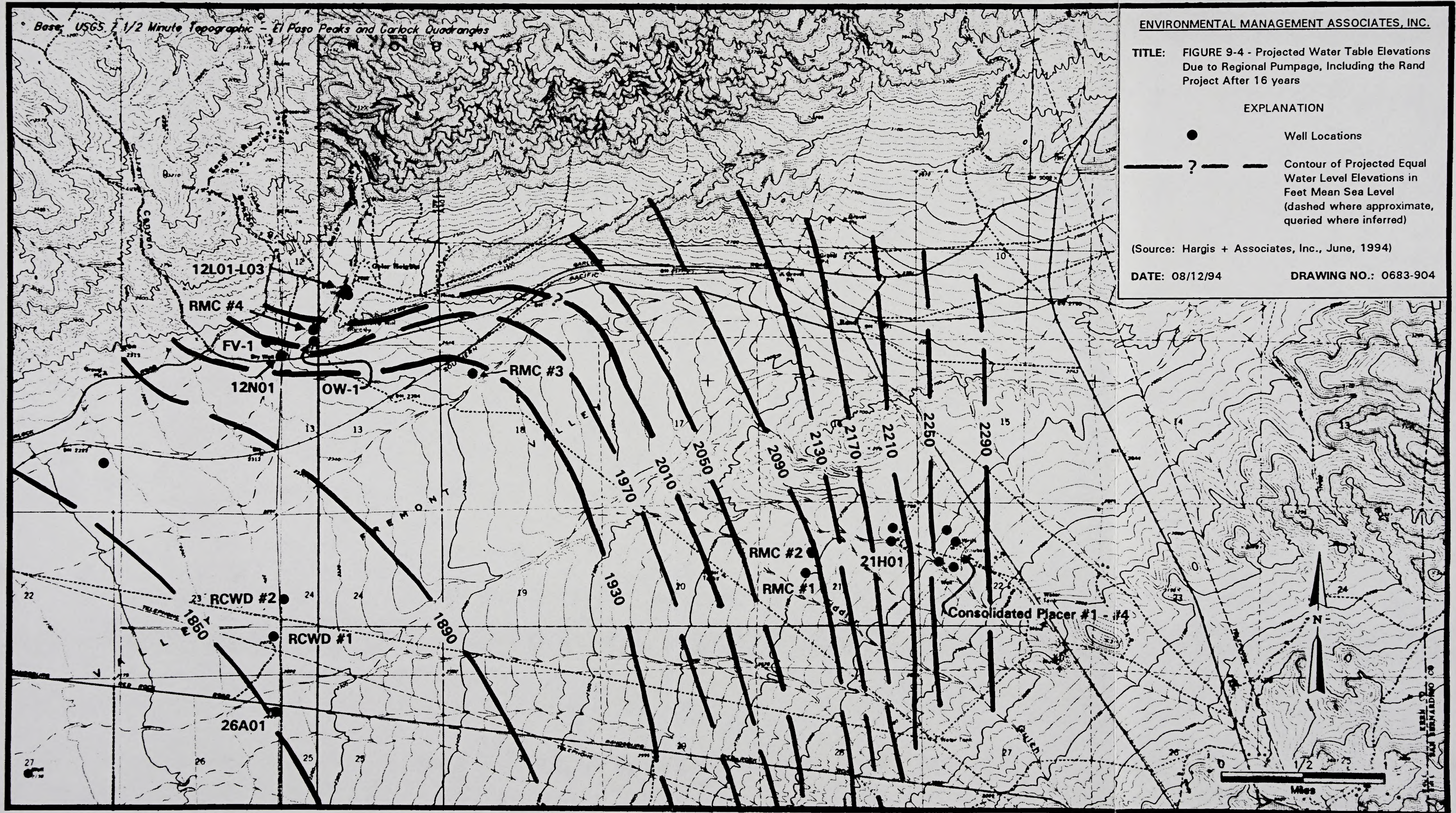
9.6.3. Air Resources

The cumulative short-term incremental increases in the impact of PM_{10}/TSP emissions over that of the Rand Project appear to be relatively minor, as the Rand Project is the largest source of these emissions within the cumulative study area. The Rand Project is the largest source of air toxics in the cumulative study area.

9.6.4. Wildlife Resources

Within the area of cumulative affect for this project, the BLM has established the RMFVMA, which is located to the west and northwest of the project area (Figure 4-10). The BLM's goal in the RMFVMA is to ensure a viable population of desert tortoise, and to identify the management actions necessary to meet that goal (USDI, 1993). The decline in the populations of the desert tortoise and the Mohave ground squirrel are at least partially due to human activities in the RMFVMA (USDI, 1993). Principal adverse human activities include OHV and mining activities. As a result of the analysis conducted in the Draft Habitat Management Plan (HMP) for the RMFVMA, the Draft HMP recommends, among other things, the closing of a majority of the RMFVMA to mineral entry and location, and designating that area as Class 1 habitat (USDI, 1989) (Figure 4-10). The remaining areas within the RMFVMA are not considered essential to the maintenance of viable desert tortoise and probable Mohave ground squirrel populations in the area. These areas would not be categorized for desert tortoise habitat and would remain open to mineral entry and location. The Rand Project is located in the area proposed to remain open to mineral entry.

The wildlife species in the area of cumulative impacts that are the subject of a majority of the concern are the desert tortoise and, to a lesser degree, the Mohave


Base: USGS 7 1/2 Minute Topographic - El Paso Peaks and Garlock Quadrangles
ENVIRONMENTAL MANAGEMENT ASSOCIATES, INC.
TITLE: FIGURE 9-4 - Projected Water Table Elevations Due to Regional Pumpage, Including the Rand Project After 16 years
EXPLANATION
Well Locations
Contour of Projected Equal Water Level Elevations in Feet Mean Sea Level (dashed where approximate, queried where inferred)
(Source: Hargis + Associates, Inc., June, 1994)
DATE: 08/12/94
DRAWING NO.: 0683-904
12L01-L03
RMC #4
FV-1
12N01
OW-1
RMC #3
RMC #2
RMC #1
21H01
Consolidated Placer #1 - #4
RCWD #2
RCWD #1
26A01
1850
1890
1930
1970
2010
2050
2090
2130
2170
2210
2250
2290
N
Miles
0
1/2
1

ground squirrel. Impacts to the desert tortoise and the desert tortoise habitat result from the cumulative disturbance of 2,574.5 acres in the dominantly creosote brush scrub vegetation community created by mining operations, motorized vehicle traffic and increased predation from the increased human activity in the area. Mitigation measures to minimize the impacts to the desert tortoise and Mohave ground squirrel have been implemented for the existing mining projects, and impact reduction measures are proposed as part of the Proposed Action. In addition, these or equivalent mitigation measures would almost certainly be implemented for the foreseeable future mining actions. The use of the area for the grazing of sheep is currently being assessed to determine what additional measures should be implemented to minimize grazing impacts to the desert tortoise and Mohave ground squirrel. Although there is no way to specifically quantify the current level of impacts to the desert tortoise and Mohave ground squirrel, the Proposed Action would result in some incremental increase to the local existing cumulative impacts.

CHAPTER 10
COORDINATION AND CONTACTS

10. COORDINATION AND CONTACTS

The following individuals, organizations, and agency representatives were contacted during the preparation of this EIS/EIR. Where appropriate, specific communications are identified as a reference (see Chapter 12, References).

State of California Agencies

California Regional Water Quality Control Board - Lahontan Region
Ted Sari, Engineer
Jay Cass, Engineer

County of Kern Agencies

Kern County Department of Public Works
Ty Cannon, Traffic Engineer

Kern County Department of Environmental Health Services
Mike Gnekow, Environmental Planner
Bill O'Rulliam, Environmental Planner

Kern County Planning Department
Scott Denney, Planner

County of San Bernardino

San Bernardino Planning Department
Andrew Rush, Planner

Private Organizations

Boral Resources
Ken Barker, Environmental Coordinator

Gear Grinders Club
Jerry Grimsley, Director

Individuals

Ted Rado, Wildlife Biologist

CHAPTER 11
LIST OF PARTICIPANTS

11. LIST OF PARTICIPANTS

This Environmental Impact Statement/Environmental Impact Report (EIS/EIR) was prepared by Environmental Management Associates, Inc. (EMA) under a contract with Rand Mining Company (RMC), under the general guidance of the Environmental Analysis Section of the Kern County Planning Department in Bakersfield, California and Mr. Dave Taylor, Mr. Ahmed Mohsen and Mr. Buzz Todd of the Bureau of Land Management, Ridgecrest Resource Area Office in Ridgecrest, California. The following is a list of individuals responsible for preparation of the EIS/EIR.

BLM personnel include:

Linn Gum, Minerals Staff Chief, Project Lead, Ridgecrest Resource Area (RRA), California Desert District (CDD), BLM

Buzz Todd, EIS Team Leader, RRA, CDD, BLM

Glenn Harris, Soil, Water, Air and Plants Specialist, RRA, CDD, BLM

Bob Parker, Wildlife Biologist, RRA, CDD, BLM

Curt Gunn, Hazmat Specialist, RRA, CDD, BLM

Dave Wash, Visual Resources and Recreation Specialist, RRA, CDD, BLM

Jim Keeler, Recreational Specialist, RRA, CDD, BLM

Ahmed Mohsen, Resource Management Specialist, NEPA Coordinator, RRA, CDD, BLM

Dan Fouler, Archeologist, RRA, CDD, BLM

Joice Schlackter, Wildlife Biologist, RRA, CDD, BLM

Dave Taylor, Geologist, BLM

Katherine Wash, RRA, CDD, BLM

Molly Brady, Chief Planning and Renewable Resources (P&RR), CDD, BLM

Doug Romoli, P&RR Staff, CDD, BLM

Rob Waiwood, District Geologist, CDD, BLM

Bob Anderson, Chief Minerals Resource Branch, BLM

Jack Mills, Environmental Coordinator, BLM

Jim Hamilton, Mining Engineer, BLM

Dr. Dwight L. Carey
Principal
D.Env. Environmental Science and Engineering, 1982, University of California, Los Angeles
M.S. Geology, 1976, University of California, Los Angeles
B.S. Geology, 1972, California Institute of Technology

Environmental professional who has managed various types of projects over 20 years, including:

- Environmental Impact Statements, Environmental Impact Reports, and Environmental Assessments
- Waste Discharge Requirement Applications, including Underground Injection Control Applications and Air Quality Impact Analyses
- Preparation of Federal, State, and Local Permit Applications for Natural Resource Development Projects

EIS/EIR principal areas of responsibility: quality control, proposed action, air resources and hydrology resources.

Richard F. DeLong

Senior Environmental Specialist
M.S. Geology, 1986, University of Idaho
M.S. Resource Management, 1984, University of Idaho
B.A. Geology, 1980, California State University, Chico

Environmental professional with 15 years of experience in environmental analysis, environmental baseline data collection and assessment, and regulatory analysis, including:

- Comprehensive and Focused Environmental Assessments, Environmental Impacts Statements and Environmental Impact Reports
- Technical Reports Including Regulatory Impact Analysis, Visual Impact Analysis and Noise Impact Analysis
- Permit Acquisition Activities for Natural Resource Development Projects

EIS/EIR principal areas of responsibility: Principal document preparer, NEPA/CEQA compliance, introduction, alternatives, wildlife, water resources, land use, socioeconomics and cumulative impacts analysis.

Teressa C. Casaceli

Senior Environmental Specialist
B.A. Geology, 1980, Hartwick College

Six (6) years of experience as an environmental manager and ten (10) years of experience as a geologist and minerals resource specialist including:

- Environmental Assessments and Environmental Impact Statements
- Preparation of Federal, State, and Local Permit Applications for Natural Resource Development Projects
- Federal Plans of Operations
- Environmental Audits and Site Assessments

EIS/EIR principal areas of responsibility: Cumulative impacts and project description.

Ellen D. Leavitt
Environmental Specialist
M.S. Geology, 1980, University of Oregon
B.A. Geology, 1975, Middlebury College

Five (5) years of experience as an environmental specialist and five (5) years of experience as a minerals industry geologist including:

- Environmental Assessments and Environmental Impact Statements
- Regulatory Compliance Analysis
- Preparation of Federal, State, and Local Permit Applications for Natural Resource Development Projects
- Coordination of Environmental Baseline Surveys
- Environmental Audits and Site Assessments

EIS/EIR principal areas of responsibility: Soils and quality control.

John P. Gilmore
Environmental Specialist
B.S. Range and Forest Management, 1981, Colorado State University

Five (5) years of experience as an environmental specialist for various projects including:

- Federal Plans of Operation
- Environmental Assessments
- Preparation of Federal, State, and Local Permit Applications for Natural Resource Development Projects
- Environmental and Compliance Audits

EIS/EIR principal areas of responsibility: Vegetation, range and soils.

Mark R. Hanneman
Environmental Specialist
M.S. Economic Geology, 1987, Colorado State University
B.S. Geology, 1979, University of Wisconsin at Madison

Fifteen (15) years of experience as a geologist and minerals resource specialist including:

- Preparation of Federal, State, and Local Permit Applications for Mining Development Projects
- Plans of Operations
- Environmental Audits
- Reclamation Plans

EIS/EIR principal areas of responsibility: Mineral resources, geology, and physiography.

Joseph M. DeStefano II
Environmental Regulatory Analyst
B.A. Political Science (Public Policy), 1992, Loyola Marymount University, Los Angeles
S.T.B. Medieval Spirituality, 1991, Loyola Marymount University, Los Angeles

Two (2) years of experience as a regulatory analyst and one (1) year of experience providing technical assistance in computerized air quality modeling analysis including:

- Air quality assessments
- Meteorological research and data review
- Computer air dispersion modelling

EIS/EIR principal areas of responsibility: Meteorology and air quality.

Scott Nikaido
Associate
B.S. Chemical Engineering, 1982, University of California, Los Angeles

Five (5) years of experience as an associate environmental scientist specializing in air quality impact analysis including:

- Air quality assessments
- Air dispersion modelling

EIS/EIR principal areas of responsibility: Air quality.

Peter Woodman
Associate
B.A. Biology, 1978, California State University, Fresno

Fifteen (15) years of experience as a biologist working in the Mojave Desert area with activities including:

- Assessments of Desert Tortoise and Desert Tortoise Habitat
- Designing and Implementing Mitigation and Monitoring Methods for Desert Tortoise Impacts
- Conducting Inventories for Mammal, Reptile and Avian Species

EIS/EIR principal areas of responsibility: Desert tortoise impact assessment review.

Richard Dodge
Associate
Ph.D., Plant Science, 1963, University of Arizona, Tucson
A.B. Biology, 1957, San Francisco State University

Thirty (30) years of experience as a botanist and arid land plant specialist including:

- Botanical expertise for Environmental Assessments and Reclamation Plans
- Soil expertise for Environmental Assessments and Reclamation Plans

EIS/EIR principal areas of responsibility: Vegetation impact assessment review and revegetation success assessment review.

Patricia Brown
Associate
Ph.D., Biology, 1973, University of California, Los Angeles
B.A. Zoology, 1968, University of California, Los Angeles

Twenty (20) years of experience as a biological resource expert for various projects including:

- Biological surveys specializing in California biota including bat populations, Mohave Ground Squirrel, and Desert Tortoise

EIS/EIR principal areas of responsibility: Bats impact assessment review.

Donald Hardesty

Associate
Ph.D., Anthropology, 1972, University of Oregon
M.A., Anthropology, 1967, University of Oregon
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Twenty-five (25) years of experience as a anthropologist, which includes:

- Anthropological and Archaeological Studies of Western U.S. Mining Camps and Towns and Westward U.S. Migration
- Development of Management Plans for Historic Archaeological Resources

EIS/EIR principal areas of responsibility: Cultural resources impact assessment review.

CHAPTER 12
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CHAPTER 13
GLOSSARY

13. GLOSSARY

ACEC -	Area of Critical Environmental Concern.
AMSL -	Above Mean Sea Level.
AN/FO -	A mixture of ammonium nitrate and fuel oil, used as an explosive for blasting purposes.
animal unit month (AUM) -	The amount of forage necessary to sustain one cow and one calf, or its equivalent, for one month.
BLM -	See Bureau of Land Management.
barren solution -	Non-precious metals-bearing cyanide solution.
Bureau of Land Management -	The agency of the United States Government, under the Department of the Interior, responsible for administering the public lands of the United States.
CEQ -	See Council on Environmental Quality.
CEQA -	See California Environmental Quality Act.
CUP -	See Conditional Use Permit.
California Environmental Quality Act -	This act establishes the mechanism by which government agencies in California document and consider the environmental implications of decisions made by the agency. The act also contains substantive provisions with which the government agencies must comply.
California Regional Water Quality Control Board-Lahonton Region -	The California Regional Agency responsible for protection of the waters of the state in the Lahontan Region. This agency is responsible for implementing California regulations, through the issuance of Waste Discharge Requirements,

	Waste Discharge Orders and National Pollution Discharge Elimination System permits, which regulate discharges to the waters of the state.
Conditional Use Permit -	The permit issued by Kern County which authorizes certain activities in the county as a conditional use within certain zoned areas of the county, in this case the mining operation within an area zoned for agricultural and other uses.
cone of depression -	The depression in a watertable or piezometric surface produced by pumping.
Council on Environmental Quality -	Created by NEPA and given the responsibility for Federal environmental policy development and the oversight of Federal agencies implementation of NEPA. Responsibilities also include issuing regulations and other guidance regarding NEPA.
CRWQCB-LR -	See California Regional Water Quality Control Board-Lahonton Region.
cyanide -	A solid chemical compound (sodium or calcium cyanide) which is dissolved in water to form a solution suitable for the extraction of precious metals from ore by using a leaching process.
EA -	See Environmental Assessment.
EIR -	See Environmental Impact Report.
EIS -	See Environmental Impact Statement.
endangered species -	An animal or plant species which is in danger of extinction throughout all or a significant portion of its range (as defined in the Endangered Species Act Amendments of 1982).

Environmental Assessment - An analytical document prepared under the National Environmental Policy Act that outlines the potential environmental effects of the Proposed Action and its possible alternatives and leads to a decision to prepare an Environmental Impact Statement or a Finding of No Significant Impact (FONSI).

Environmental Impact Report - A detailed statement prepared under the California Environmental Quality Act describing and analyzing the significant environmental effects of the proposed project and discussing ways to mitigate or avoid the effects.

Environmental Impact Statement - An analytical document prepared under the National Environmental Policy Act that discusses the potential significant impacts to the human environment of a Proposed Action and its possible alternatives. An EIS is developed for use by decision makers to weigh the environmental consequences of a potential decision.

fee land - Land in which the United States government has conveyed the fee simple interest in the surface, and possibly the minerals, into private ownership.

geologic time scale - See Appendix D.

heap leach pad - A facility on which a pile of ore is placed in several layers, each approximately 25 feet in height. The pile is underlain by impermeable material to collect the leach solutions.

Kern County Local Lead Agency responsible for implementing California Surface Mining and Reclamation Act (SMARA) and California Environmental Quality Act (CEQA) and approving Conditional Use Permit with accompanying Reclamation Plan subject to conditions.

lode - A mineral deposit that is contained within bedrock, as opposed to a placer deposit.

Migratory bird - Means any bird, whatever its origin and whether or not raised in captivity, with belongs to species listed in Section 10.13 of the Migratory Bird Treaty Act (16 USC 701-718h), or which is a mutation or a hybrid of any such species, including any part, nest, or egg of any such bird, or any product, whether or not manufactured, which consists, or is composed in whole or part, of such bird or part, nest, or egg thereof. All birds are considered migratory with the exception of three (3); English sparrow (*Passer domesticus*), starlings (*Sturnus vulgaris*), and barnyard pigeons (*Columba livia*). The Migratory Bird Treaty Act makes no provisions for killing migratory birds.

NEPA - See National Environmental Policy Act.

National Environmental Policy Act - The act that established the procedures by which the environmental consequences of a decision by agencies of the federal government are analyzed and documented prior to the decision being made.

Negative Declaration - A document prepared under the California Environmental Quality Act which makes the finding from the initial study that the project will not have a significant adverse affect on the environment.

OHV - Off-highway vehicle.

open pit - The area from which ore and waste rock are removed.

PM_{10} -	Particulate matter that is less than 10 microns in diameter.
POO -	See Plan of Operation.
patented land -	A mining claim for which the United States government has conveyed the fee simple interest in the surface and minerals into private ownership.
placer -	A deposit of mineral resources which is formed by an alluvial process and contained within alluvial material.
Plan of Operation -	A document prepared by the proponent of any mining development of locatable minerals and filed with the Bureau of Land Management, which presents a detailed discussion of the proposed project.
precious metals recovery plant -	A plant and equipment used to extract the precious metals from the pregnant solution.
pregnant solution -	A precious metals-bearing cyanide solution which contains sufficient quantities of gold and silver that can be sent to the precious metal recovery plant to remove the precious metals from the solution.
project area -	Has the same meaning as Rand Project area.
Proposed Action -	A description of the project as proposed by the project proponent in the Plan of Operations and the Conditional Use Permit application.
public land -	Any land and interest in land owned by the United States within the states and administered by the Secretary of the Interior through the Bureau of Land Management, without regard to how the United States acquired ownership, except: (1) lands located

	on the Outer Continental Shelf; and (2) lands held for the benefit of Indians, Aleuts, and Eskimos.
Rand Project area -	The 2,520 acres area identified in the Plan of Operations filed with the BLM and the CUP application filed with Kern County.
Reclamation Plan -	A document submitted to the BLM and Kern County, the respective federal and local Lead Agencies, that details the specific measures to be taken by the project proponent to reclaim the project lands during mining operations and after mining and leaching have been completed.
SMARA -	See Surface Mining and Reclamation Act.
solution ditch -	An above-ground, trough-shaped structure that is lined with an impermeable material and engineered to convey cyanide solution from the heap leach pad to the solution pond.
solution pond -	A bowl-shaped structure that is lined with an impermeable material and engineered to contain cyanide solution from the heap leach pad for processing in the precious metals recovery plant and subsequent recirculation to the heap leach pad.
Surface Mining and Reclamation Act -	An act passed by the California legislature which prescribes the reclamation of mined lands within the state of California and directs the Counties within the state to review and approve a reclamation plan of each mining operation as part of the County's Conditional Use Permit process.
unnecessary or undue -	In conjunction with the degradation of lands, describes activities which would cause environmental impacts greater than what would

normally occur for specific activities, or would be necessary to conduct specific activities.

WSA -	Wilderness study area.
Waste Discharge Order -	A permit issued by the California Regional Water Quality Control Board which governs the construction, operation and closure of the heap leach pad, process ponds and the precious metals recovery plant.