minerals management plan

LAKE MEAD

NATIONAL RECREATION AREA / ARIZONA-NEVADA

MINERALS MANAGEMENT PLAN

Lake Mead National Recreation Area

Arizona/Nevada

September 1988

U.S. Department of the Interior
National Park Service

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INTRODUCTION

GENERAL MANAGEMENT PLAN

A General Management Plan (GMP) for the Lake Mead National Recreation Area was finalized and published in 1986. In part, that GMP effort was directed toward determining which areas of the park would remain open to consideration of mineral development, and which areas of the park would be categorically closed to mineral development. In keeping with mandates in the park's enabling legislation, decisions on whether areas of the park were open or closed to mineral development were based on the presence or absence of sensitive resources in the park, and an analysis of the likely impacts of mining on those resources. The following map, reproduced from the GMP, shows those areas open (Resource Utilization Subzone (RUS)) and closed to mineral development (all other zones). A more detailed version of this map, Map 602 2291B entitled "Resource Utilization Zones" was published in the Federal Register on Monday, May 16, 1988, to define by Township, Range, and Section, those areas excepted from mineral leasing.

PLANNING UNIT DESCRIPTIONS

Because Lake Mead NRA is such a large and complex area the GMP divided it into nine smaller planning units. Following is a description of those five planning units containing resource utilization subzones.

Katherine. The Newberry Mountains are found in the southwest corner of this unit and reach elevations of 5,600 feet which offers a cool refuge from the desert environment. These mountains are rich in outstanding geologic features, springs, a variety of flora and fauna, an archeological remains such as the Grapevine Canyon petroglyphs. These mountains offer a high quality scenic backdrop to Lake Mohave from the Katherine Landing developed area. The rest of the unit is made up of fingerlike drainages and alluvial fans that spread toward the lake from the Black Mountains in Arizona and the Newberry Mountains in Nevada. The two RUS's in this unit consisting of 39,360 acres primarily fall within these large alluvial fans.

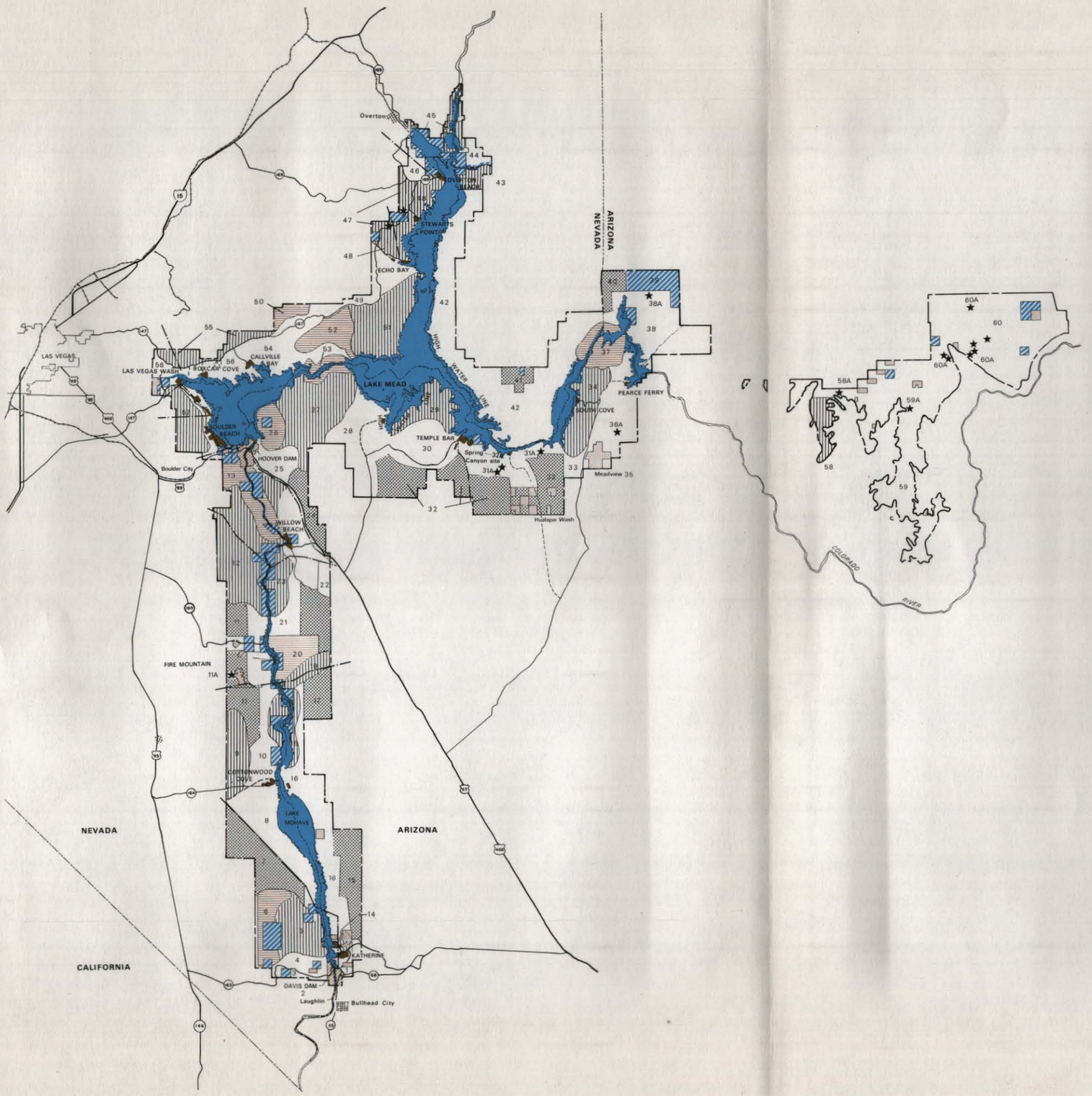
Cottonwood. The Black Mountains capped by 2,000 foot Mt. Davis and scattered with washes and side canyons are found on the Arizona side in this unit. The northern end of the unit also exhibits the colorful Fire Mountain and its surrounding scenery. An isolated stand of palo verde (the only naturally occurring stand in the recreation area and typically a Sonoran Desert plant) is found just south of Fire Mountain. This is the northernmost range of the palo verde and it has been placed in an environmental protection management zone.

The western portion of this unit manifests Copper Mountain and Opal Mountain with a dense forest of teddy bear cholla from just south of the Cottonwood Cove access road north to the Eldorado Mountains. Aztec Spring is a valuable water source for native wildlife. Wintering bald eagles utilize this unit along the lakeshores. The two RUS's in this unit consisting of 27,000 acres are located back away from the lake in the foothills of the Black Mountains and the Eldorado Mountains.

Willow Beach. This unit primarily encompasses the rugged Black Mountains in Arizona and the picturesque Eldorado Mountains in Nevada. Scenic Black Canyon (which divides these two mountain ranges) holds the course of the Colorado River. The unit exposes a maze of peaks and side canyons with vertical cliffs extending to the edge of the Colorado River. The Malpais Flattop Mesa, an old lava dome, and Jumbo Wash, with its 36 square miles of watershed, are also found in this unit. Three RUS's comprising 28,730 acres are located in the rugged terrain of the Black Mountains where numerous prospects, shafts and tunnels give us a hint of past miner's hopes.

Virgin/Temple. Large gypsum beds are found in the western portion of this unit both on the Arizona and Nevada sides of Lake Mead. Most of these gypsum beds are flat to low rolling hills. The eastern side of this unit finds mostly low, rolling hills at the foot of the Gold Butte range and the White Hills. Beautiful vistas across the Virgin Canyon also adds to the grandeur of this unit. Wintering bald eagles are often seen in this unit. The three RUZ's consisting of 52,000 acres are found in the foothills of the Gold Butte and the White Hills. The larger of these two units is found south of Temple Bar and extends for approximately 22 miles west to east through low rolling hills and desert washes ending on the western escarpment of Grapevine Mesa.

Gregg Basin/Grand Wash. This unit contains rugged mountain ranges which provide a scenic background for the Greggs Basin section of Lake Mead. Gentle outwashes extend from the base of the mountains into the lake waters. Spectacular vertical strata in the outstanding geology of Iceberg Canyon may be examined from the lake surface by proceeding up finger coves which penetrate the desert. The rugged terrain of the Wheeler Ridge, extending north from Grapevine Mesa, provides habitat for a herd of bighorn sheep while visitors enjoy the primitive camping at Pearce Ferry on the eastern side of the ridge. Grapevine Mesa and the sharply cut foothills of the Grand Wash Cliffs are found in the southeast corner of this unit. One RUS consisting of 4,300 acres is found on the west side of the Grand Wash in the Million Hills.



ACREAGE	NATURAL ZONE
317,930	★ ENVIRONMENTAL PROTECTION SUBZONE
51,580	OUTSTANDING NATURAL FEATURE SUBZONE
680,520	NATURAL ENVIRONMENT SUBZONE
51,280	**HISTORIC/ARCHEOLOGICAL ZONE**

DEVELOPMENT ZONE

8,780	DEVELOPMENT SUBZONE
	ACCESS SUBZONE (Not shown, but roads shown on the alternative maps and Approved Roads map.)

SPECIAL USE ZONE

191,500	RESERVOIR SUBZONE
5,030	BUREAU OF RECLAMATION PROJECT LANDS SUBZONE
14,090	NONFEDERAL LANDS SUBZONE
148,970	RESOURCE UTILIZATION SUBZONE *
12,795	UTILITY CORRIDOR SUBZONE

* Mineral leasing is only permitted in the resource utilization subzone

Numbered areas 1–60A are described in the table entitled Management Zoning explanation

N

5 0 5 10 15 MILES
5 0 5 10 15 20 KILOMETERS

MANAGEMENT ZONING

(PROPOSED LAND USE)

LAKE MEAD NATIONAL RECREATION AREA

ARIZONA - NEVADA

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

602 | 20,048-F
SEPT 88 | DSC

PURPOSE OF THIS DOCUMENT

The purpose of this document is to provide NPS staff and potential lessees and/or operators an understanding of the processes and procedures that will be followed if a mineral development operation is proposed within an area designated open for consideration of mineral development. There are three types of mineral rights within Lake Mead NRA: mining claims, federal mineral leases, and non-federal oil and gas. These mineral rights are described in more detail below.

The remainder of this document is organized in a manner which is intended to assist park management in the review of mineral leasing applications and/or plans of operation for mining claims or non-federal minerals. Specifically, Chapter II discusses mineral ownership; Chapter III outlines procedures to be followed when reviewing a specific application, and is organized by type of mineral right; Chapter IV is a general discussion of various uses associated with mineral rights, and outlines NPS policy on each type of use; Chapter V is a general discussion of types of stipulations that may be applicable to mineral development activities--note these are not site-specific stipulations which will need to be developed case-by-case as mineral operations are proposed; Chapter VI discusses abandoned mineral properties; and last, Chapter VII outlines typical mining scenarios which may provide useful comparisons for the park when they analyze site-specific operations.

MINERAL OWNERSHIP

The federal government originally had title to both surface and subsurface on all public lands. The federal government transferred title to public lands to private or state entities under a variety of land disposal laws. The resulting complexity in surface and subsurface ownership patterns was further complicated when in some instances the federal government reacquires surface rights but did not purchase mineral rights. The following map reproduced from the GMP shows the landownership status of lands within Lake Mead NRA.

Mineral rights exist in Lake Mead because:

1. Mining claims were located prior to the creation of the recreation area/ No new claims can be located. Valid, old claims convey to the claimant the right to extract federally owned minerals. Fee title to the surface is acquired if the claims are taken to patent.

2. Mineral leasing is permitted in the recreation area. These federal leases convey a leasehold mineral right to federally owned minerals.

3. The surface and subsurface rights of private parties have not been acquired by the federal government.

The remainder of this document is organized by type of mineral right.

TYPES OF MINERAL OPERATIONS AT LAKE MEAD

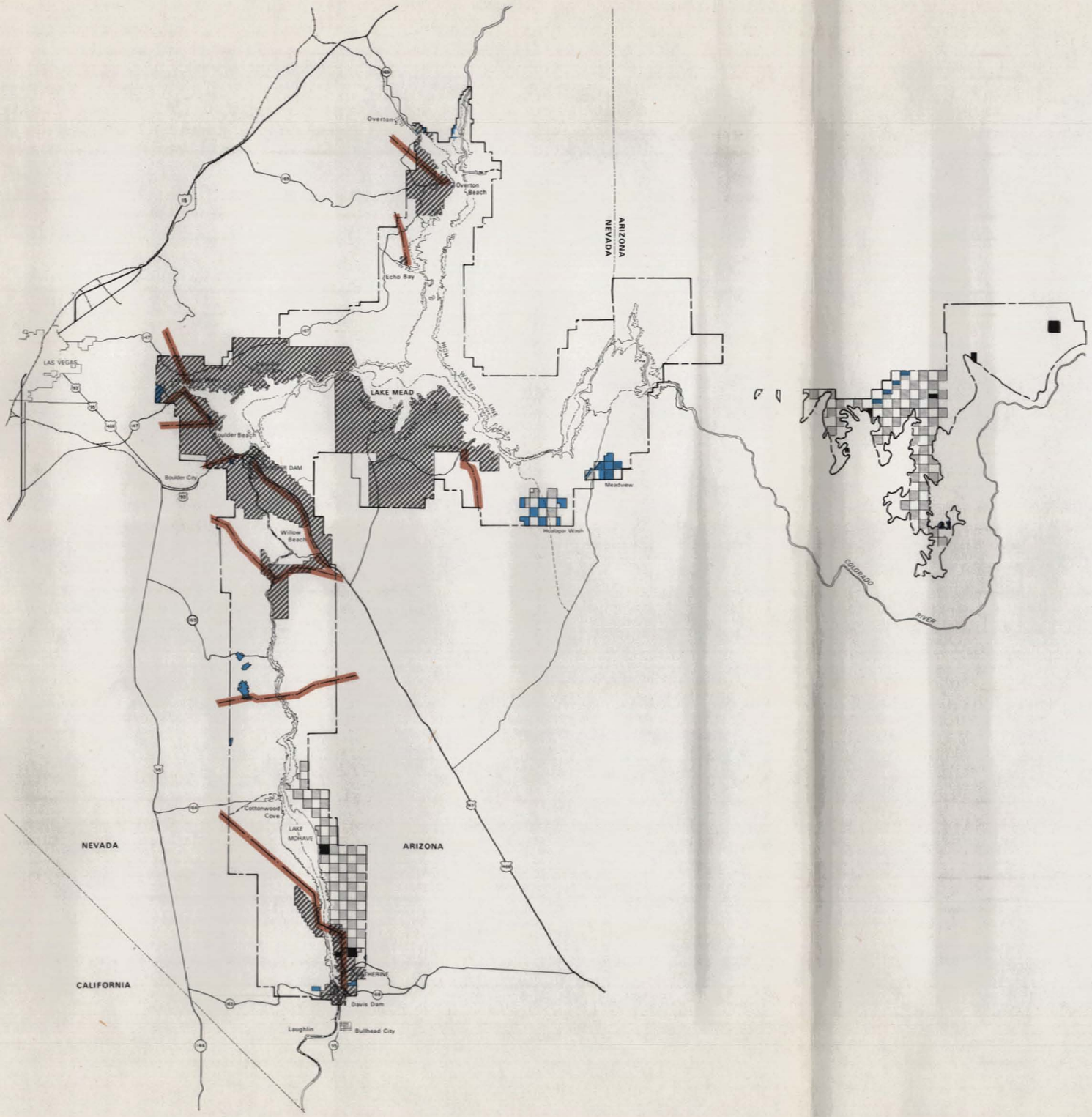
FEDERAL LEASING

Mineral related activities may occur in LAME, subject to NPS review and approval. Activities include issuance of prospecting permits, noncompetitive oil and gas leases, preference-right leases, review and approval of operating plans for activity on any lease or permit, renewal of any lease or permit or any simultaneous offer for oil and gas of previously leased tracts of land. The procedures for reviewing these activities are explained in detail in the "NPS Procedures for Managing Federal Mineral Leasing and Operations" (NPS, 1984), herein after called the leasing manual.

The review process is similar whether reviewing an application for a lease or permit or an operating plan for activity on an existing lease or permit. A step-by-step process for reviewing these activities is presented in the following flowchart. Each numbered step in the chart is supported by explanatory text in the leasing manual.

The leasing procedures are used in conjunction with park-specific planning documents such as the statement for management, general management plan, and mineral management plan. Other NPS planning and compliance documents should be used as appropriate, including: NPS-12 (NEPA Compliance Guidelines), mineral leasing regulations (43 CFR Groups 3100 and 3500); and other documents which specifically address issues that arise in the review of mineral leasing activities.

Throughout the leasing procedures, reference is made to "operating plans". This term is used in a generic sense to refer to any plan submitted by a lessee or permittee for the purpose of obtaining NPS approval to conduct operations of any kind on an existing lease or permit,including: exploration plans, mining plans, surface use plans, drilling plans,and applications for permit to drill (APD). Any activity on a lease or permit must be approved via one of these plans, which are referred to collectively as operating plans.



SYMBOL	OWNERSHIP	ADMINISTRATION	ACREAGE	CURRENT LAND USE	NOTES
	FEDERAL	NPS	1,463,357.06*	Public Recreation	Some Developed Areas
	FEDERAL	NPS	12,795.00	Utility Corridor	Various Companies
	FEDERAL	B/R	5,029.00*	Power Generation	Permanent Bur.of Rec. Withdrawals (facilities)
	FEDERAL	NPS	55,000.00	Undeveloped	Santa Fe RR (Subsurface Rights)
	FEDERAL	NPS	———	Undeveloped	Bureau of Reclamation Withdrawals (future use)**
	NONFEDERAL	STATE	2,654.71*	Undeveloped	State School Lands
	NONFEDERAL	PRIVATE	11,435.23*	Undeveloped or Altered	Various Owners

* These figures total the NRA's gross acreage of 1,482,476.00

** Most withdrawn lands around Lake Mead and Lake Mohave are being released by the Bureau of Reclamation.

N

5 0 5 10 15 Miles

5 0 5 10 15 20 Kilometers

LANDOWNERSHIP STATUS

LAKE MEAD NATIONAL RECREATION AREA

ARIZONA - NEVADA

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

602 | 20,037-H
SEP 88 | DSC

Authorities

The enabling act for Lake Mead National Recreation Area (NRA) (16 U.S.C. Sec. 460n) authorizes Federal mineral leasing in the area. The enabling act states "the Secretary (of the Interior) may provide for the following activities, subject to such limitations, conditions or regulations as he may prescribe, and to such extent as will not be inconsistent with either the recreational use or the primary use of that portion of the area heretofore withdrawn for reclaimation purposes:...(3) Mineral Leasing..."The Mineral Leasing Acts for 1920 and 1947 (30 U.S.C. Sec. 181 and 351) are not the authority for mineral leasing at Lake Mead NRA.

Leasing of federal minerals at Lake Mead NRA is a discretionary, rather than a mandatory, responsibility of the Secretary of the Interior. The Secretary has chosen to exercise this discretion and permit federal mineral leasing. The Lake Mead enabling act requires that leasing of federal mineral take place under "regulations as he (the Secretary) may prescribe." the regulations that govern federal mineral leasing at Lake Mead NRA are found at 43 CFR Subparts 3100 and 3500.

The regulations governing leasing of federal minerals at Lake Mead provide for the leasing of the following minerals:

a. oil and gas, as defined in 43 CFR Sec. 3000.0-5 (a) and (b); and
b. solid materials (including hardrock minerals), other than coal and oil shale, as defined in 43 CFR Sec. 3500.5 (h) and (n).

Minerals such as coal, oil shale, and mineral materials, such as sand, gravel or building stone are specifically excluded from the mineral that may be disposed of under the regulations at 43 CFR Subpart 3500. Thus, the NPS may not issue leases for these minerals in Lake Mead NRA. The NPS may, however, issue leases for hardrock minerals that would normally be subject only to claim location under the Mining Law of 1872. Hardrock minerals include but are not limited to, gold, silver, uranium, lead, and tungsten.

The NPS may issue leases for the above minerals on federal lands in the NRA, whether the federal lands are acquired or reserved from the public domain.

The regulations require that the NPS may consent to federal mineral leases or permits only if no significant adverse effect results to the resources or administration of the area (43 CFR Sec. 3109.2(b) and Sec. 3582.3). Those regulations also describe "excepted areas" i.e. areas within Lake Mead NRA where federal mineral leasing will not be permitted.

Leasing, or other forms of disposal of minerals on Hualapi Indian lands are governed solely by the laws that relate to Indian lands (16 USC Sec. 460n-2(b)).

Areas Open for Consideration of Leasing

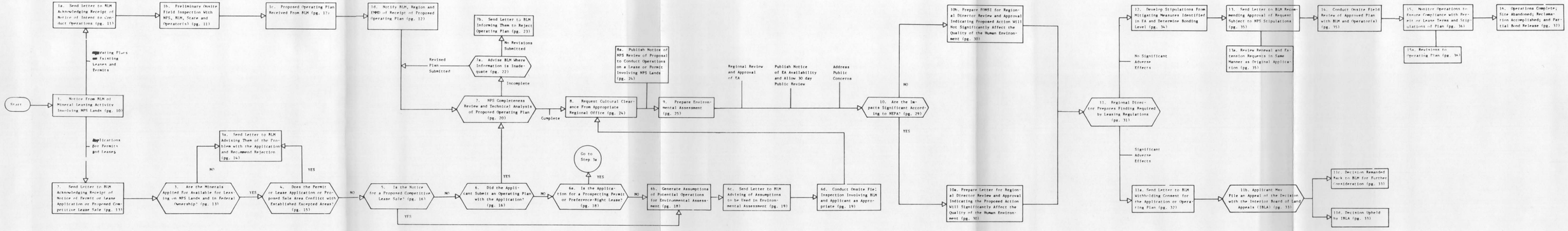
The legislation that established LAME as a unit of the National Park System permits mineral leasing only if it will not interfere with the purposes for which the unit was created, primarily the reclamation project and public recreation and if there will be no adverse effects on the resources or administration of the unit. Areas of LAME that are open for mineral leasing and development are identified in the final GMP. The only areas which are open are where designated as the resource utilization subzone (RUS) of the special use zone. A more detailed version of this map, Map 602 2291B entitled "Resource Utilization Zones" was published in the Federal Register on Monday, May 16, 1988, to define by Township, Range, and Section, those areas excepted from mineral leasing. If lease or permit applications are received for areas closed to mineral development by the GMP they must be rejected, since mineral development has already been determined to be inconsistent with the administration, resources or public recreation in those areas.

Those portions of the NRA that are included in the RUS of the GMP are available for leasing consideration; however, they may not be totally available for mineral leasing or development. Further site specific analyses of potential mineral activities and their impacts are required to ensure that there would be no significant adverse effects on resources or administration of the NRA by granting a mineral lease or permit. The degree to which adverse effects may occur is based not only on the location and resources of the potential lease area, but also on what types of activities are proposed. An area may be suitable for underground mining but not suitable for strip or surface mining, for example, because of visual or scenic values. At the same time, site-specific analyses could result in the discovery of natural or cultural resources of such magnitude or significance that would preclude any kind of ground disturbing activities.

Lake Mead will not approve a proposed plan of operations providing for the diversion of water from a point outside lease boundaries. Nor will Lake Mead approve a plan of operations for open pit mining, construction of mills or mill sites, or a plan which proposes on-site employee quarters.

NPS REVIEW PROCESS FLOWCHART

12/3/84



Minerals Available for Leasing

Minerals that are subject to leasing in LAME are identified in the Mineral Leasing Act of February 25, 1920, as amended (30 USC 181 et seq.), the Acquired Lands Mineral Leasing Act of August 7, 1947, as amended (30 USC 351 et seq.) and the Combined Hydrocarbon Leasing Act of November 16, 1981 (30 USC 181 et seq.). These minerals include the following:

- oil and gas (including all vein-type solid hydrocarbons and nongaseous hydrocarbons other then coal, oil shale and gilsonite)
- deposits of chlorides, sulfates, carbonates, borates, silicates or nitrates of potassium and sodium
- sodium, magnesium, aluminum or calcium deposits, in any of the forms described and associated with the potassium deposits
- phosphates
- solid (hardrock) minerals that are normally subject to location under the US mining laws

Resources not available for leasing in any NPS unit are geothermal resources, coal, oil shale and mineral materials (i.e. sand, gravel, pumice and other building materials).

Step-by-Step Review Process For Mineral Leases

The leasing manual explains in extensive detail the process which NPS follows to review a lease. The leasing manual will be followed when an actual application is received. Highlights of the leasing manual are outlined below.

Notice from BLM of Mineral Leasing Activity Involving NPS Lands. BLM must (by regulation) obtain NPS consent prior to issuing prospecting permits or leases on federal lands within NPS boundaries. BLM must also obtain NPS concurrence before approving any activity on a lease or permit. Specially, the regulations [43 CFR 3109.2(b) and 3566.3] state that:

> Any lease or permit respecting minerals [within NPS units] shall be issued or renewed only with the consent of the Regional Director, National Park Service. Such consent shall only be granted upon a determination by the Regional Director that the activity permitted under the lease or permit will not have a significant adverse effect upon the resources or administration of the area pursuant to the authorizing legislation of the area. Any lease or permit shall be subject to such conditions as may be prescribed by the Regional Director to protect the surface and significant resources of the area, to preserve their use for public recreation, and subject

to the condition that site specific approval of any activity on the lease will only be given upon a concurrence by the Regional Director...

Because of these requirements, the park will receive notices that:

i) BLM has received an application for a noncompetitive oil and gas lease or prospecting permit

ii) BLM is proposing to hold a competitive lease sale for an area that includes land within NPS boundaries

iii) BLM has received a request for renewal or extension of an existing lease or permit

iv) BLM is proposing to offer previously leased NPS lands for reissuance under the simultaneous filing system, or

v) BLM has received an application for a preference-right lease

vi) BLM has received a notice of intent to conduct operations from a permittee or lessee for an area within NPS boundaries

Preliminary Onsite Field Inspection with NPS, BLM, State and Operator. The purpose of the preliminary onsite field inspection is for all parties involved (NPS, BLM, State, operator and any subcontractors) to visit the proposed site to discuss the magnitude and scope of the proposed operation, including access, and to express NPS concerns at an early stage. Some of the concerns which the NPS should address at the field review include:

- sensitive resources to be avoided (rare, endemic, threatened or endangered species or critical habitat; cultural resource sites; unreclaimable soils; floodplains or wetlands)
- access--what areas to avoid and what areas to consider; NPS standards for road construction; county or other jurisdictions regulations
- concerns regarding visibility of the operation from high visitor use areas of the NRA or from scenic overlooks; adjustment of operations to topography
- minimizing effect on visitor access for recreation

Are the Minerals Applied for Available for Leasing on NPS Lands and in Federal Ownership? The NPS must review the permit or lease application or competitive lease sale proposal to verify if the minerals applied for by the applicant, or being considered by the BLM, are available for leasing on NPS lands. The BLM will make the initial determination of availability; however, the NRA should be aware of minerals which are not available for leasing in order to verify this determination.

Pursuant to the Mineral Leasing Act of 1920, the Acquired Lands Mineral Leasing Act of 1947, and the Combined Hydrocarbon Leasing Act of 1981 and the acts specifically creating these units of the NPS, minerals available for leasing are listed in the preceeding section entitled Minerals Available for Leasing. If the material applied for is not available for leasing on NPS lands the application must be rejected.

After ascertaining whether proposed minerals are available for leasing, the NPS must verify surface and subsurface ownership for the land included in the permit or lease application or competitive lease sale proposal. If either the surface or subsurface estate is not in federal ownership, the application must be rejected.

Is the Notice for a Proposed Competitive Lease Sale? Wherever there are known deposits of minerals, or known geologic structures that are favorable for the production of oil and gas or other minerals, the BLM is responsible for identifying such areas and for conducting competitive lease sales on them. BLM will notify the NPS of its intent to hold a competitive lease sale and will request NPS consent prior to any lease sale that involves NPS lands.

NPS must analyze the impacts of potential development activities associated with operations that may occur on the leasehold in order to determine whether a finding of no significant adverse effect can be made in compliance with the regulations.

Did the Applicant Submit an Operating Plan with the Application? The NPS must be able to make a finding of no significant adverse impact on the resources or administration of the NRA in order to consent to the issuance of a permit or lease, since granting the permit or lease provides the right to develop the minerals. The leasing manual details the types of information regarding potential operations that the NPS needs to conduct an analysis of impacts that may result from approving an application. The information outlined in the leasing manual must be submitted as part of a plan of operations.

The requirements of prospecting permits and noncompetitive oil and gas leases are different in that:

- prospecting permit applicants are required by the NPS to submit an exploration plan with the permit application
- applicants for noncompetitive oil and gas leases are requested by the NPS to submit a complete operating plan with their application so that the NPS can base its impact analysis on the applicants development plan rather than on a hypothetical maximum reasonable development scenario generated by the NPS.

Generate Assumptions of Potential Operations for Environmental Assessment. The NPS is responsible for generating assumptions of potential operations when:

i) an applicant chooses not to submit an operating plan with an application for a noncompetitive oil and gas lease

ii) the BLM is proposing a competitive lease sale that includes NPS lands

Information supplied by the lease applicant may be limited to the minerals and the tract of land being sought. In such instances, the NPS will need to prepare maximum reasonable development scenarios in order to assess the impact of leasing on that particular tract of land.

By using known data about nearby operations in similar environments, and by knowing the local topography, geology, existing access routes and nearby processing or transportation facilities that might be used, the NPS must develop assumptions about a maximum reasonable development scenario.

Assumptions concerning maximum development must by considered because the lease grants the right to develop and produce the mineral, if discovered. Assumptions must be generated in the following areas to provide the basis for an impact analysis:

- access--where, when, how often, and by what means
- anticipated exploration, drilling or mining method(s)
- general area of lease or permit targeted for activity, including possible sites for support roads and facilities
- water use--source, amount, and availability; status of water rights
- waste disposal--method and location (includes refuse, human waste, and mine or well discharges or spoils), including discharges, possible sedimentation and pollution of surface and ground waters
- approximate life of the project
- size of the operation--anticipated workforce, production rates, and amount and type of equipment
- product transport method including existing or proposed corridor siting
- processing facilities and site(s), methods, etc.

Scenarios for "typical mineral production" for several types of minerals are presented later in this document in the section entitled Typical Mining Scenarios.

NPS Completeness Review and Technical Analysis of Proposed Operataing Plan. When an operating plan is received, whether as part of a lease or permit application, or to request permission to operate on an existing lease or permit, the NPS must perform a completeness review and technical analysis of the plan. The purpose is to assess the completeness of the information submitted by the applicant and to evaluate the safety and appropriateness of the proposed operating methods. The BLM will conduct a completeness review before forwarding the operating plan to the NRA. The NPS review will concentrate on special NPS requirements as identified in the leasing manual.

The plan must be analyzed to determine whether it is complete according to NPS requirements, and whether it is technically adequate. The NPS analysis should answer the following two questions:

i) Is the information supplied in the plan sufficient to satisfy BLM regulatory requirements and additional NPS requirements identified in the leasing manual? The BLM will conduct a completeness review to determine if it meets their requirements, so this will involve only a verification role on the part of the NPS. (See the leasing manual for additional details on regulatory regulations.)

ii) Will the mining methods proposed result in acceptable safety performance on, and environmental protection of, NPS lands? The following are examples of information to be examined, however, the list is not all inclusive:

- is pillar spacing sufficient to prevent surface subsidence?
- if surface mining is proposed, is it the most environmentally sound method for extracting minerals?
- is the method of tailings and other waste or discharge disposal acceptable (location, depth)?
- are state-of-the-art exploration, mining or drilling techniques being fully used?
- is proposed reclamation effective and self sustaining?

Send Letter to BLM Informing Them to Reject Operating Plan. There are three instances in which the NRA should inform the BLM to reject an operating plan based on the failure of the applicant, permittee or lessee to provide information identified by the NPS as necessary for the impact analysis:

1) for an exploration plan accompanying a prospecting permit application

2) for an exploration plan or plan revision on an existing prospecting permit

3) for an operating plan or Application for Permit to Drill (APD) on an existing lease

The NPS must inform BLM to reject these plans if the information supplied does not meet with regulatory requirements and the applicant refuses to provide the additional information, since the NPS would not have sufficient information on which to base a finding of no significant adverse effect. The reasons for rejection of the prospecting permit application or operating plan for an existing lease or permit should be clearly explained in the letter to BLM.

Request Cultural Clearance from Appropriate Regional Office. A determination regarding the presence of cultural resources must be made.

i) For permits and lease applications and competitive lease sale proposals, a determination can be made at the NRA based on existing knowledge of cultural resources and current management zoning. The NRA may either deny applications in identified cultural resource zones or apply a no surface occupancy stipulation (NSO). The decision on how to proceed depends on the size of area involved and what types of activities are anticipated (e.g., directional drilling may be utilized on oil and gas leases to recover minerals under a NSO area).

ii) When actual surface disturbance will result from proposals for operations under prospecting permits or leases, site-specific cultural resource surveys will be required by the applicant. At this stage in the review of all operating plans, the NRA should contact the appropriate regional cultural resource staff to request assistance. They will be able to provide guidance on whether a survey is necessary and how to get one done if needed. They may also be able to provide a list of contractors that the NRA could provide to the applicant.

Publish Notice of NPS Review of Proposal to Conduct Operations on a Lease or Permit Involving NPS Lands. In order to involve the public and other interested agencies at the earliest possible point in the review process, a public notice should be published in the Federal Register and in local newspapers announcing that the NRA is reviewing a proposed operating plan submitted by the holder of a prospecting permit or lease within the NRA.

The announcement need not be specific, but should identify what is being reviewed, the general area of the NRA involved, the estimated time necessary for review, and a person to contact for further information. The announcement should also explain that the review will include preparation of an environmental assessment that will be made available for review and comment at a later date.

Prepare Environmental Assessment (EA). An environmental assessment sufficient to meet NEPA requirements must be completed by the applicant on all lease and permit applications (including renewals and simultaneous offers), proposed competitive lease sales, and all operating plans (refer to NPS-12, chapter 3 for specific guidance). The NPS must however conduct its own evaluation of the environmental issues and take responsibility for the scope and context of the EA. The intent of this evaluation is not to do work for or redo work done by the applicant, but that their work be verified by the NPS which has the ultimate responsibility for satisfying the NEPA process. It should be noted that the quality of the EA will be directly related to the input provided by the NPS--particularly the

provision of information on park resources and policy that could be affected by the action. The EA will serve as the written documentation to support the Regional Director's determination of the effects of the proposal on the resources and administration of the NRA, as required by the mineral leasing regulations [43 CFR 31309.2(b) and 3566.3].

Because the NPS mineral leasing regulations require the Regional Director to deny consent for any lease, permit or activity,if it will result in significant adverse effects to the resources or administration of the unit, the NEPA process would be terminated by the EA stage if significant effects are found. Normally, when an EA finds significant impacts it leads to the preparation of an EIS. However, because of the consent clauses in the leasing regulations, if a determination of significant adverse effects results from the EA, the proposal must be denied and an EIS need not be prepared.

The environmental assessment evaluates anticipated activities in terms of their potential impact(s) on the statutory and administrative responsibilities of the NRA. It should consider such responsibilities as purpose of the unit, management goals of the unit as expressed in legislation and planning documents, impact on potential land classifications such as wilderness, effect on endangered species, air quality, water quality and visitor use. The environmental assessment must also evaluate all environmental considerations related to impacts on the natural and cultural resources of the unit. The analysis must consider secondary and indirect effects from the proposal as well as direct effects. Finally, the cumulative impact of the action must be assessed. The purpose of cumulative impact analysis is to see if the impacts of one action may combine with the impacts of past or concurrent actions to form more significatnt impacts than when considered seperately. The application or operating plan, accompanying information, onsite inspection report and park-specific documents on resources serve as the main information sources for the environmental assessment.

The EA on prospecting permit applications need only evaluate potential impacts of the exploration phase as proposed in the applicants operating plan, since all prospecting permits will contain a standard stipulation clearly consenting to only exploration activities on the permit. Further development on any minerals discovered is subject to an NPS finding that no significant adverse effect will result from development of the mineral resource. If a valuable deposit is discovered, the permittee will apply for a preference-right lease, at which time the impacts of development and production will be evaluated.

An EA on all lease applications, however, must evaluate potential impacts that may result from exploration, development and production activities over the life of the lease. Although the

NPS will review any proposed activities on the lease and can add necessary stipulations to protect resources, development of mineral resources cannot be prevented once the lease is issued. It is imperative, therefore, that the EA adequately address all potential activities in order that management is fully aware of the ramifications of approving the lease.

No specific format is required for an EA, however, NPS-12 requires the following sections be included in the EA: purpose and need for the proposal, alternatives, environmental impacts of the alternatives, and a list of persons and agencies consulted during preparation of the document. See NPS-12, Chapter 3-2 C for a detailed discussion of each of the four sections.

There are also several compliance actions required by various laws and executive orders that are separate from, but must be integrated into, the NEPA compliance process. These actions are not required in every EA, but are dependent on the resources that will be affected by the proposal. Three of these separate compliance actions are listed below to provide examples of the extent that some of these processes involve.

i) The Endangered Species Act of 1973, as amended, requires formal consultation with the U.S. Fish and Wildlife Service pursuant to section 7(c) whenever the agency responsible for the proposed action determines the proposal may affect a listed threatened or endangered species.

ii) Executive Orders (EO) 11988 and 11990 require consideration of floodplains and wetlands in the NEPA process. The NPS published separate guidelines for complying with these EO's in 45 FR 35916 and made minor revisions in 47 FR 36718.

iii) Section 106 of the National Historic Preservation Act requires that federal agencies with direct or indirect jurisdiction over a federal, federally assisted or federally licensed action allow the Advisory Council on Historic Preservation a reasonable opportunity to comment on actions that affect properties included in, or eligible for inclusion in, the National Register of Historic Places prior to the approval of the proposal.

<u>Are the Impacts Identified in the EA Significant According to NEPA?</u> Based on an analysis of the impacts documented in the EA and any public comments received, the NPS must determine if the proposed action will significantly affect the quality of the human environment.

If it is determined, based on any analysis of the impacts identified in the EA and any public comments received, that the proposed action:

i) will significantly affect the quality of the human environment, that decision must be documented in a letter to the Regional Director to be used as a basis for his her rejection of the proposed action.

ii) will not significantly affect the quality of the human environment, a Finding of No Significant Impact (FONSI) must be prepared.

Prepare Letter for Regional Director Review and Approval When the Proposed Action Will Significantly Affect the Quality of the Human Environment. In the normal NEPA process, a finding of significant impact would lead to the preparation of an EIS. However, because of the Regional Director's finding required in the NPS mineral leasing regulations, the point at which significant adverse effect is determined, the proposed action must be denied. No further environmental compliance is required.

The decision that the proposed action will significantly affect the human environment must be well documented in a letter to the Regional Director. The letter to the Regional Director documenting the significance of the impacts should attach the EA, public comments and any other information pertinent to the decision.

Prepare FONSI for Regional Director Review and Approval When the Proposed Action Will Not Significantly Affect the Quality of the Human Environment. The document summarizing the significance of the impacts identified in the EA is normally prepared by the same person(s) who prepared the EA. This document is then reviewed by the Superintendent for concurrence, and forwarded to the Regional Director for review and approval.

There is no set format for a FONSI, however, it must meet the content requirements of 516 DM 2.3c which require the EA or a summary of the EA be attached, as well as any other environmental documents related to it be noted. Additionally, if the proposed action requires compliance with other legislation, such as the Endangered Species Act, the National Historic Preservation Act, or Executive Order requirements, evidence of such compliance should be completed and documented before the FONSI is approved and signed. The FONSI should conclude with a statement that the

proposal does not constitute a major federal action significantly affecting the quality of the human environment, and that an EIS will not be prepared. The FONSI must be a separate document from the EA rather than a part of it, and must be signed by the Regional Director. NPS-12, Chapter 3-4 should be used as guidance in preparing a FONSI.

The FONSI shall be accompanied by an Impact/Mitigation Matrix as provided for under Western Region Directive 87-1, Environmental Mitigation And Monitoring Guidelines. The park staff will have responsibility of preparing the matrix based on information in the applicant's assessment and on other measures park staff believes appropriate to identify.

Regional Director Prepares Finding Required by Leasing Regulations. The consent provisions of the NPS mineral leasing regulations [43 CFR 3109.2(b) and 3566.3] require the Regional Director to make a finding of no significant adverse effect of the proposal on the resources or administration of the NRA before a lease or permit may be issued, or activities on a lease or permit are approved. This decision is separate from the determination of impact made in the EA and must be documented separately. The regulatory finding may be prepared as soon as the NEPA determination of significance is made.

For this analysis the Regional Director must first identify, on the basis of the enabling legislation, planning documents (land protection plans, general management plans, resource management plans) and other data and research that may be available, the important resources, values, and attributes of the NRA. The Regional Director must then determine whether the predicted impacts will violate the mandated responsibilities of the Service to preserve the NRA for present or future visitors. The following decision criteria have been developed to aid the Regional Director in making a management decision about whether such conflict would occur:

i) Can it be reasonably anticipated that the proposed activities will result in impacts that would violate a mandatory responsibility for which the NRA was established or is managed? This would include any violation or likely violation of applicable statute (e.g., Clean Air Act, Endangered Species Act, National Historic Preservation Act) regulations, or established NPS management policies (e.g., land protection plan, general management plan, resource management plan, minerals management plan). Examples of this type of impact include, but would not be limited to, an unmitigatible or unacceptable impact to an endangered or threatened species, an unmitigatable or unacceptable impact on a National Historic Landmark in a park unit, a violation

of a National Ambient Air Quality Standard established under the Clean Air Act, or any mineral proposal within an excepted minerals development area as identified in a minerals management plan.

If the answer to criterion (i) is yes, then the Regional Director must find that there would be a significant adverse effect on the resources or administration of the NRA. In this instance, the Regional Director must notify BLM in writing that the proposed actions would result in significant adverse effects on resources or administration of the NRA, and therefore the NPS cannot consent to the actions proposed. The letter should further state that, based on the NPS finding of significant adverse effect, the BLM must deny the permit, lease, or plan of operation.

If the answer to criterion (i) is no, proceed to criterion (ii).

ii) This criterion is directed at determining if the proposed operation would irrevocably conflict with the preservation of a single significant resource, value or attribute: Can it be reasonably anticipated that the proposed activities will result in an impact or impacts that would change the character of the land, a single resource or resources, or the quality of the visitor experience (i.e., present and future within the NRA) in such a manner or to such a magnitude or extent, or occurring with such timing (i.e., daily or seasonal), or frequency, or duration, or at such location that the impact or impacts would diminish the resources, values or attributes for which the NRA was established? Examples of this type of impact would include, but are not limited to, the destruction of a scenic panorama whose value has been determined to be of local or national significance, the destruction of species habitat that is integral to the unit,or a repeated smoke plume visible during a period of significant visitation of the NRA.

If the answer to criterion (ii) is yes, then the Regional Director must find that there would be a significant adverse effect on the resources or administration of the NRA. In this instance, the Regional Director must notify BLM in writing that the proposed actions would result in significant adverse effects on resources or administration of the NRA, and therefore the NPS cannot consent to the actions proposed. The letter should further state that, based on the NPS finding of significant adverse effect, the BLM must deny the permit, lease, or plan of operation.

If the answer to criterion (ii) is no, then proceed to criterion (iii).

iii) This criterion is designed to determine whether a combination of impacts to several different resources, values and attributes could conflict with their preservation for present and future generations. Can it be reasonably anticipated that the proposed activities will result in impacts that, when considered cumulatively or synergistically, would change the character of the land, a single resource or resources, or the quality of the visitor experience (i.e., present and future) within the NRA in such manner, or to such magnitude, or extent or with such timing (i.e., daily and seasonal) or frequency or duration or at such location that the impacts would diminish the resources, values or attributes for which the NRA was established? Examples of this type of impact would include, but are not limited to, where the cumulative effects of noise, odor, and visual intrusion change the basic character of an important resource area of the NRA or result in an unacceptable change in recreational opportunities.

If the answer to all three criteria is no, then the NRA will proceed with development of stipulations, establish boundary levels, etc.

Develop Stipulations from Mitigating Measures Identified in the EA and Impact Mitigation Maxtrix and Determine Bonding Level. The NEPA process identified and developed mitigation measures necessary to ensure protection of certain resources and/or the health and safety of park visitors. These mitigation measures must now be used as stipulations for the lease, prospecting permit or operating plan. Lake Mead is responsible for developing appropriate stipulations. The Lake Mead consent letter to BLM should make it clear that NPS consent is contingent on the stipulations becoming conditions of the lease, permit or plan.

The applicant, when signing the lease, formally agrees to the terms of the stipulation. Should the applicant not agree to the terms of the lease, e.g., the stipulations, then the lease is not issued. The NPS does not need to make stipulations agreeable or economically feasible to the lessee. Its only concern when developing stipulations is the protection of NPS resources.

Review Renewal and Extension Requests in Same Manner as Original Application. Whenever an application for renewal or extension is filed, it will only be forwarded to the NPS by the BLM if the lease or permit has a right of renewal. In reviewing these requests the NPS should concern itself with determining whether

renewal will cause significant adverse effects to the resources or administration of the area in the same manner as the original application.

"Consent" of the Regional Director is required for all renewals subject to the regulatory "finding". The NRA should treat the request for renewal or extension exactly as it treated the original application. If circumstances surrounding the lease or permit have not changed since the original application and knowledge of park resources in the area or management goals have not changed, then the impact analysis may involve only a brief update of the previous EA. However, if management zoning has changed significantly or discovery of significant resources in the lease or permit area has occurred, the NRA should complete a new NEPA analysis which evaluates the application in light of the new data or conditions. It is possible to make a significant adverse effect finding in an area where leasing had previously been found to have little or no impact based on existing knowledge.

Conduct Onsite Field Review of Approved Plan with Operator(s) and BLM. Once the NPS and BLM have approved an operating plan for activity on NPS lands, the NRA should request in writing to the BLM that an onsite review of the approved plan be held. The NPS, BLM, operator and any subcontractors should attend this session for the purpose of reviewing the approved operating plan and stipulations. The NPS should carefully discuss its stipulations with the operator(s) to ensure that they are fully understood. The NRA should also identify any areas in which disturbance will not be permitted pursuant to the stipulations, and have the operator stake his primary areas of operation, including access routes. In this way the NPS can ensure that minor realignments of the area of operation can be accomplished prior to surface disturbance. In addition, the NPS should take this opportunity to advise the operator that regular NPS monitoring patrols will be occurring and make arrangements for an individual to contact regarding the operation.

Monitor Operation to Ensure Compliance with Permit or Lease Terms and Stipulations Attached to the Plan. The BLM has the authority for all monitoring and enforcement of operations to ensure compliance with terms of the approved plan of operations. However, given the number of active operations which the BLM must monitor, the NRA must assume a role in monitoring all operations on NPS lands; a certain responsibility falls upon Lake Mead to inspect the operation regularly, be familiar with the terms of the plan and ensure that the terms are being complied with.

enforcement authority, however, still rests with the BLM and the NPS must report all violations in writing to the appropriate BLM office. In situations where the alleged violations threaten immediate, serious or irreparable damage to the environment or the health and safety of park visitors, the NRA should take immediate action to correct the situation, even if it means shutting down the operation. All such actions must be reported in writing to the BLM immediately. The BLM will then pursue discipline of the operator.

Revisions to Operating Plans. Modifications to a plan of operations may be initiated at any time by either the operator, the NPS or the BLM to adjust to changed conditions or to correct an oversight. Changes must be agreed to by all parties and must be presented in writing. Once changes are agreed to in writing they become part of the approved plan of operations. Changes to plans may also be subject to the NEPA process and require a supplement to the EA. The level of detail of this analysis will be dependent on the changes being proposed.

Proposed changes on oil and gas/combined hydrocarbon operations must comply with 43 CFR 3160 and with Onshore Oil and Gas Order No. 1. Modifications to mining operations must comply 43 CFR Part 3570. 43 CFR Section 3572.1 (e) provides for changes to plans of operations subject to the mutual consent of BLM and the operator. On NPS lands the consent of the NPS is also required for all activities on a lease or permit.

Operations Complete; Site Abandoned, Reclamation Accomplished and Partial Bond Release. Whenever approved operations on a permit or lease are completed and no further operations are anticipated, the site will be abandoned by the operator. Before abandonment, all reclamation required by the operating plan and regulations must be accomplished to the satisfaction of the NPS before the performance bond will be released. The operator may opt to subcontract the reclamation. Whatever means are used to accomplish the reclamation, the NRA should carefully review the work to ensure compliance with the terms of the operating plan. Assistance in determining the adequacy of the reclamation may be obtained from the Environmental Assessment Section, Energy, Mining and Minerals Branch or by contacting the appropriate regional minerals contact.

When reclamation has been accomplished to the satisfaction of the NPS a letter should be sent to the BLM indicating that the performance bond may be released. In the arid west, the industry standard is to hold a performance bond for a period of ten years to determine the success of the reclamation.

MINING CLAIMS

Authorities

The federal public domain lands that now comprise Lake Mead National Recreation Area were generally open and subject to the location of mining claims under the authority of the Mining Law of 1872 (30 U.S.C. Sec. 28 et seq.) until those lands were withdrawn from water power and reclamation purposes pursuant to the Act of June 25th, 1910 (formerly at 43 U.S.C. Sec. 141, repealed in 1976). The Oct. 1964 enabling act for Lake Mead (16 U.S.C. Sec. 460n) is silent on claim location. When the Recreation Area was established, however, the lands of the NRA were for the most part encompassed by the reclamation withdrawals and thus closed to claim location. Subsequently, Congress, in the Mining in the Park Act (16 U.S.C. Sec. 1901 et seq.), closed all NPS units to the operation of the mining laws. Thus, Lake Mead NRA is closed to claim location. Mining claims in Lake Mead must have been located prior to the withdrawal of the lands in Lake Mead from entry.

The Mining in the Parks Act also directed the Secretary of the Interior to promulgate regulations governing "all activities resulting from the exercise of valid existing mineral rights on patented claims within any area of the National Park System.." (16 U.S.C. set 1902). These regulations are found at 36 C.F.R. Part 9, Subpart A and they govern the conduct of mineral activities in Lake Mead NRA in connection with valid mineral rights on all patented and unpatented claims. Such mineral activities include the extraction of non-locatable minerals from claims. The regulations give access across Lake Mead lands to claims outside the unit boundaries.

Plan of Operations Review Procedure for Mining Claims

The regulations at 36 CFR subsection 9A, control mineral development activities in connection with mining claims within the boundary of Lake Mead NRA. Nonmineral related activities on patented claims are not subject to regulations at 36 CFR Part 9.

On valid unpatented and patented mining claims, operators may conduct mineral activities including access, assessment work, exploration,development and transport of minerals only under, and in accordance with, an NPS approved plan of operations (see 36 CFR subsection 9A.

Lake Mead may approve, and the claimant may conduct operations in exercise of valid mineral rights only within the physical confines of the claim boundaries. The NPS will neither authorize nor approve any plan of operations providing for the use of federal lands outside claim boundaries except for access and transport of equipment, materials and commodities to and from the claim. The NPS will not approve a proposed plan of operations providing for the diversion of water from a point outside claim boundaries. Nor will the NPS approve a plan of operations for open pit mining, construction of mills or mill sites, or a plan which proposes on-site employee quarters.

For claims (i.e., private minerals) that lie outside of the Lake Mead National Recreation Area, the Superintendent may approve a proposed plan of operations for access across the unit, if such access is by foot, pack animal or on a road designated under the Superintendent's authority in 36 CFR subsection 1.5 (36 CFR subsection 9.3 (c)).

The regulations at 36 CFR subsection 9A detail the information the operator must submit in a proposed plan of operations. The information required to satisfy these regulations is more thoroughly explained for operators in the Guide to National Park Service Regulations Governing Mining Claims (36 CFR Part 9, Subpart A) and for NPS personnel in NPS Procedures for Managing Mining Claims (in draft). These information requirements include:

- names and addresses of the operator;
- map showing the proposed area of operations, access routes, and surface facilities;
- description of the mode of transport and major equipment to be used;
- the estimated timetable for each phase of operations;
- the nature and extent of the know deposit;
- a reclamation plan;
- evidence of the steps taken to comply with any applicable federal, state and local laws;
- an environmental report; and
- a discussion of the unit's planning documents

The environmental report must provide data that enables Lake Mead to effectively analyze the impacts of the proposed operations so that Lake Mead can decide on whether to approve or disapprove the proposed plan. The environmental report is to include a thorough and detailed description of the environment to be affected (36 CFR subsection 9.10(b)(9)(i). In order to satisfy this requirement, the operator must provide Lake Mead with a complete cultural and biological resource survey as part of the proposed plan of operations.

As part of the plan review process, Lake Mead must determine that the data submitted in the environmental report and other parts of the proposed plan of operations is accurate.

The Regional Director must cause an environmental assessment to be prepared for each proposed plan that includes an examination and evaluation of the following: environmental report, the proposed operations, the reclamation plan, the adequacy of the bonding level, the impacts, including the cumulative impacts, that will likely result from proposed operations on unit resources; and whether an EIS is necessary.

If the operator has submitted a proposed plan that contains all the information required in 36 CFR subsection 9A, the Regional Director may then consider the proposed plan and determine if the NPS may approve the plan under the standards of 36 CFR subsection 9.10.

The Regional Director possesses the authority to approve proposed plans of operation. The regulations prescribe standards that the plan of operations must meet before it may be approved. Regulations at 36 CFR subsection 9A detail the procedures for approval of the proposed plan of operations. The Regional Director will disapprove any plan that contains insufficient information upon which to make an informed decision. The Regional Director will notify the operator of the deficiencies and of how to correct them. The Regional Director must disapprove a proposed plan that does not meet the standards prescribed in the regulations.

Any decisions that the Regional Director makes under 36 CFR subsection 9A may be appealed by the aggrieved owner/operator by submitting a written statement to the regional director detailing how a decision conflicts with a law or regulation. The Regional Director must either reverse the decision or write a statement explaining the decision and forward the statement and the record on the case to the NPS Director in Washington D.C. The Director must render a decision within 45 days of receipt, with an extension, if necessary.

Once the plan of operations is approved, the operator may then conduct operations in compliance with that plan only after having posted a performance bond as required under 36 CFR subsection 9A. The Regional Director determines the amount of the bond and that amount must equal the estimated cost of reclamation.

Reclamation requirements for mining claims are also set forth in 36 CFR subsection 9A. Reclamation must be as contemporaneous with operations as possible but in no case may it be initiated any later than six months after completion of operations. The Regional Director may waive this requirement where necessary. The bond will not be released until the park Superintendent

certifies to the Regional Director that all reclamation requirements in the approved plan of operations have been completed.

Lake Mead must comply with all federal statutes and executive orders requiring federal agencies to review and assess their actions for impact on the environment.

These statutes include but are not limited to the National Environmental Policy Act, the Endangered Species Act, and the National Historic Preservation Act. Determinations under this and similar statutes are the responsibility of the NPS and other federal agencies. The operator is required only to supply the information upon which the NPS can make its determinations.

Mineral Right Acquisition

Mining Claims. Six groups of patented mining claims totalling 990.39 acres are within Lake Mead National Recreation Area. These claims are shown in the following table with recommended actions as they are presented in the land protection plan for Lake Mead. Three of these groups are located within the resource utilization zone, two in the natural environment zone and one in the historic zone.

Land Protection Plan Recommendations for the Six Groups of Patented Claims within Lake Mead NRA

[RUS = Resource Utilization Subzone]

[NEZ = Natural Environment Zone]

[H/AZ = Historic/Archeological Zone]

ZONE	NAME	ACRES	STATUS	RECOMMENDATION
RUS	Rockefeller Claims	110.00	Undeveloped	Delete by boundary revision
RUS	Eldorado Claims	18.05	Undeveloped	Fee acquire with low priority
NEZ	Vault Gold/ Murry Claims	100.55	Undeveloped	Check exchange possibility otherwise delete by boundary revision
NEZ	Katherine Claims	11.85	Residential	Fee acquire with low priority
H/AZ	Goldstrike Claims	36.89	Commercial	Fee acquire with low priority

RUS	Capitol Camp Claims	713.05	Undeveloped	Fee acquire with low priority

The Katherine claims have been subdivided and residential dwellings now cover these claims. No mining activity is expected to occur on these claims. The Goldstrike claims occur on both sides of State Route 93 and are now covered with a commercial development which includes a hotel, casino, water filter plant, sewage ponds, gas station and parking lots. The rest of the claims are undeveloped and no mining activity is expected to occur on these claims. Because of the expense involved in purchasing developed properties the Goldstrike and Katherine claims will remain a low priority. The remaining claims are all undeveloped and acquisition or deletion by boundary revision should be accomplished as a low priority.

Retained Mineral Rights. The Santa Fe Pacific Railroad previously owned large acreages now within the NRA, in the typical checkerboard pattern of alternate sections granted to encourage early rail construction. When such lands were sold back to the Federal government prior to creation of the NRA, Santa Fe Pacific retained certain subsurface mineral rights. These rights are considered as a part of the bundle of rights which make up fee simple ownership; the NRA is not considered the fee owner of these lands.

Specifically, Santa Fe Pacific holds subsurface oil, gas, coal and other mineral rights (including the right to certain necessary surface facility construction) on approximately 55,000 acres. They also retain rights to construct railroad tracks and associated structures on or across some 3,000 acres of those same lands, and to repurchase rights-of-way for such facilities at a per acre price based on the original sales price. No exercise of the alleged rights has ever taken place on NRA lands. There is at present no indication that commercially viable amounts of any oil, gas or other minerals do indeed exist on these lands.

In the event that Santa Fe Pacific proposed exploration or development of its mineral interests, various regulations would apply. Specifically, exploration or development of private oil and gas rights would be subject to regulations at 36 CFR 9B. Coal mining within the National Recreation Area would be prohibited under Section 522 of the Surface Mining Control and Reclamation Act of 1977. At this time, however, there are no regulations governing development of nonfederal (private) minerals other than oil and gas.

The lands on which these rights exist are widely scattered and their physical character is difficult to generalize. Those sections east of Lake Mohave are gently rolling, undeveloped lands in the desert shrub habitat type are easily visible from the lake, and are crossed by various approved but unmaintained access roads used by park visitors.

Additional Santa Fe rights are claimed at Hualapai Wash and Meadview, where in some cases the surface lands are privately owned by different parties or are in Federal ownership. The third major area is the isolated, high elevation, undeveloped, wooded Shivwits Plateau, overlooking the Grand Canyon, which in general is not accessible by road.

Approximately 12,000 acres, or 22% of the Santa Fe mineral rights fall within the Resource Utilization Subzone (RUS). Nearly 2,500 fall within environmental protection zones. At present no economically viable mineral deposits have been reported to lie on or under there lands. (The Land Protection Plan for the NRA recommends acquisition of the Santa Fe mineral rights, but until such time as specific proposals are made to explore or develop minerals, acquisition should be given low priority.)

Value of these mineral rights has not yet been determined and there is presently disagreement between the National Park Service and Santa Fe Pacific on the relative value of these rights. When value of the rights is agreed upon, priorities for acquiring the rights should go first to those 2,500 acres within the environmental protection zone, second to the 40,500 acres in the natural environment zone and third to rights within the resource utilization zone.

The National Park Service will continue to pursue the acquisition of Santa Fe mineral rights within the Lake Mead National Recreation Area.

There are presently no on-going negotiations with Bureau of Land Management to affect the acquisition of non-Federal mineral rights.

NON-FEDERAL OIL AND GAS

Plan of Operations Review and Approval

Operations must possess an approved plan of operations in compliance with 36 CFR 9B before they can develop nonfederal oil and gas within Lake Mead National Recreation Area. The information that is required to satisfy the regulations is explained in greater detail for operators in the Guide to National Park Service Regulations Governing Nonfederal Oil and Gas and for NPS personnel in NPS Procedures for Managing Nonfederal Oil and Gas. These information requirements include:

- proof of right to conduct operations
- maps showing the affected site and location of access roads and operations;
- a description of major equipment;
- an estimated timetable
- geological information pertaining to the deposit;
- anticipated hazards and steps taken to mitigate them'
- reclamation procedures and costs;
- waste disposal techniques;
- evidence that operations are in compliance with applicable federal, state and local laws and regulations;
- background information to enable NPS to determine environmental impacts; and
- a discussion of the unit's planning documents.

The operator must provide information in sufficient detail so that the NPS may effectively analyze the impacts of the proposed operations on the unit and make a decision on whether to approve the proposed plan. To meet this information requirement, the operator must provide the NPS with a complete cultural and natural resource survey as part of the proposed plan of operations.

The proposed plan of operations must be evaluated as containing all the information required in subsection 9.36(a) which the superintendent determines as pertinent to the type of operations proposed [subsection 9.36(c)]. The Superintendent must evaluate the need for any additional information required to establish whether the operator has the right to conduct operations; or, effectively analyze the proposal; or, to make recommendations to the Regional Director regarding approval or disapproval [subsection 9.36(a)(18)]. If information submitted within a proposed plan has been submitted in a prior approved plan of operations, the park must check to make sure appropriate cross-references are sufficient to incorporate that information and whether such cross-referencing constitutes an acceptable plan.

The plan of operations must also discuss the unit's statement for management and other planning documents of the unit, as furnished by the superintendent [subsection 9.36(d)]. The plan must address activities proposed to control, minimize or prevent damage to the recreational, physical, biological, scientific, cultural, and scenic resources of the unit and must include any reclamation procedures recommended by the superintendent [subsection 9.36(d)].

No plan of operations will be approved in Lake Mead that allows for employee quarters on site or uncontainerized reserve pits.

The proposed plan, once found to be complete by the park, is submitted to the Regional Director so that it may be determined as adequate [subsection 9.36(c)], and therefore qualify for further consideration by the Regional Director.

The authority to approve a plan of operations rests with the Regional Director. Approving a plan of operations is a federal agency action, therefore, before approving the plan, the Regional Director must comply with all federal statutes and executive orders requiring that federal agency actions be reviewed and assessed for their impact, including cumulative impacts, on the human environment. (See previous discussion under leasing.)

The Regional Director's analysis of the proposed plan must include an examination and evaluation of the following: the environmental report; the proposed operations; the reclamation plan; adequacy of the bond; the impacts, including the cumulative impacts that will likely result from the proposed operations on unit resources; and whether an EIS is necessary.

If the operator has submitted a plan that contains all of the information required in 36 CFR subsection 9B, the Regional Director may approve the plan only if it meets the standards of approval in 36 CFR subsection 9B.

The Regional Director always has the option, in lieu of approving a proposed plan, to initiate acquisition proceedings that would preclude nonfederal oil and gas development, if the proposed development is clearly harmful to unit resources.

Regulations at 36 CFR subsection 9B detail the requirements for approval of a plan of operations. The requirements include time limits obligating the NPS Regional Director, under most circumstances, to make a determination on the proposed plan within a fixed number of days of its receipt. The time period begins on the day the plan is received by the Superintendent and includes all calendar days thereafter. The Regional Director may notify the operator that thirty more days is needed for review.

The Regional Director will reject a plan that contains insufficient information upon which to make an informed decision and then notify the operator of the plan's deficiencies and how the deficiencies may be corrected.

Approval of the plan constitutes the permit for the conduct of operations and access. No other permit, such as a Special Use Permit, is necessary or will be issued.

The operator may appeal decisions concerning a plan of operations under procedures prescribed by 36 CFR subsection 9B. The operator's first appeal of a Superintendent's decision is made to the Regional Director. The appeal must be filed within thirty days after the adverse action or decision. The Regional Director must review this complaint promptly. If the Regional Director sustains the decision,the complaint is forwarded to the NPS Director with a statement of reasons. The operator then has thirty days to appeal to the Director, who may initiate a hearing before the Office of Hearings and Appeals. The Director has forty-five days to decide, unless more time is required. The decision of the Director is the final administrative action of the agency on a proposed plan of operations.

As outlined in 36 CFR subsection 9.48,a performance bond is required for all approved plans of operations within Lake Mead National Recreation Area. The purpose of NPS performance bonding requirements is two fold. Bonds can be used to guarantee the operator's satisfactory compliance with the terms and conditions of all applicable regulations and all terms and conditions of the plan of operations and any associated lease, permit or contract. Also, the monetary value of the bond or security deposit should be adequate to pay for on-site reclamation, in the case of operator default.

Information contained in the proposed plan of operations, verified by site visit, is the basis for estimating both reclamation costs and costs for clean-up of the site based on the type of operations proposed. Thus, the plan of operations is the basis for determining the amount of bond or security deposit the NPS must require. The proposed plan of operations must not be approved and operations cannot begin until the NPS approving official receives an acceptable bond or security deposit,in the required dollar amount. Also, the posted bond or security deposit is not released until all the requirements of the approved plan of operations, particularly approved reclamation procedures, are successfully and acceptably completed.

36 CFR subsection 9.48(d) specifies that the total bond or security deposit shall be in an amount determined from the following estimates:

(1) an amount equal to the estimated cost of reclaiming the site, either in its entirety or in phases, that has been damaged or destroyed as a result of operations conducted in accordance with an approved plan of operations [subsection 9.48(d)(1)]; and

(2) an amount to bond against the liability for any damages to Federally-owned or -controlled lands, waters, or resources resulting from failure to comply with the terms and conditions of operations, as approved by state or federal agencies [subsection 9.48(d)(2) and subsection 9.51(a)]. Amounts for resource damage liabilities shall not exceed those listed in subsection 9.48(d)(2).

Subsection 9.48(d) limits the bonding obligation of an operator to a total not to exceed $200,000. If separate operations obligate an operator above the $200,000 bonding obligation limit, the operator may substitute a blanket bond in the value of $200,000 for all operations conducted within the unit.

According to the regulations, estimating the total bonding obligation of the operator requires estimating two figures, one for the cost of reclamation and the other for the costs of clean-up from a catastrophic event possible for each type of operation proposed (i.e., oil spill, the escape of gas, wastes, contaminated substances or fire caused by the operation). Performance bonds and bonds procedures are explained in greater detail for operators in the Guide to National Park Service Regulations Governing Nonfederal Oil and Gas and for NPS personnel in NPS Procedures for Managing Nonfederal Oil and Gas.

Lake Mead National Recreation Area is responsible for ensuring that nonfederal oil and gas activities comply with NPS regulations, other statutes and regulations. Many laws require that the NPS review their actions and consider the impacts of those actions on the environment as a whole, or on particular aspects of the environment, such as water, air or wildlife.

The NPS must assess its mineral related activities in compliance with the statutes listed below. It is fully the responsibility of the applicant who seeks approval of a plan of operations, to provide all the data upon which the Service can prepare an environmental assessment. The Service is responsible for determining if the data submitted by the applicant is accurate and reliable, however, the Service will not gather this data on behalf of applicants.

Statues that nonfederal oil and gas activities must comply with in Lake Mead National Recreation Area include:

- National Environmental Policy Act (NEPA) (42 U.S.C., subsection 4321 et seq.)
- Endangered Species Act (16 U.S.C. subsection 1531 et seq.)
- National Historic Preservation Act (16 U.S.C. subsection 470 et seq.)

- Protection and Enhancement of the Cultural Environment (Executive Order 11593)
- Archaeological Resources Protection Act (16 U.S.C. subsection 470aa)
- Antiquities Act (16 U.S.C. subsection 431-433)
- Executive Order 11988: Flood Plain Management
- Executive Order 11990: Protection of Wetlands
- Clean Air Act (42 U.S.C. subsection 7401 et seq.)
- Clean Water Act (33 U.S.C. subsection 1151 et seq.)
- Section 402 permits (33 U.S.C. subsection 1342)
- Section 404 permits (33 U.S.C. subsection 1344)
- Safe Drinking Water Act (42 U.S.C. subsection 300F et seq.)
- Resource Conservation and Recovery Act (42 U.S.C. subsection 6901 et seq.)
- Comprehensive Environmental Response, Compensation and Liability Act (42 U.S.C. subsection 9601 et seq.)
- Wilderness Act (16 U.S.C. subsection 1131 et seq.)
- Federal Land Policy and Management Act (43 U.S.C. subsection 1701 et seq.)
-Land and Water Conservation Fund Act (16 U.S.C. subsection 4601 et seq.)
- General Authorities Act (16 U.S.C. subsection 1a-5a)
- American Indian Religious Freedom Act (42 U.S.C. subsection 1996 et seq.)

NONFEDERAL MINERALS OTHER THAN OIL AND GAS

Authorities

Congress has specifically and directly provided for the NPS to permit development of nonfederal minerals, other than oil and gas, in several NPS units. Most unit enabling acts, including Lake Mead's, do not contain a specific or direct provision for nonfederal mineral activity. In light of the Redwood Amendment, therefore, the NPS may permit activity in connection with such nonfederal mineral rights in units where Congress has not provided for such activity, if the NPS determines that the activity is not in derogation of park values and purposes.

If the proposed mineral activity, in connection with nonfederal minerals other than oil and gas rights,is "in derogation of park values and purposes," (which purposes are enunciated in the unit enabling act and the Organic NPS Act), the NPS cannot permit that activity, and will seek means to preclude it.

Because regulations governing such mineral activity do not exist, the NPS governs such mineral activities under Special Use Permit, citing as authority for the permit, that provision of the unit enabling act providing for mineral activity. In a unit, like Lake Mead NRA, where specific authorization is lacking, the Special Use Permit may cite the regulation at 36 CFR Sec. 5.6(c)

that permits the Superintendent to grant access across "park area roads" to persons who possess nonfederal lands (minerals) within the NPS unit boundaries. This permit shall be used as the vehicle to regulate the conduct of activities in connection with the nonfederal mineral rights, other than for oil and gas.

In Lake Mead NRA, for example, it is likely that nonfederal mineral activity would not be found in derogation of park values and purposes, if the activity were in the resource utilization subzone. On the other hand, mineral activity in one of the protection zones would very likely be in derogation of park values and purposes. The nature and scope of the proposed operations must also be considered to determine if derogation would occur.

The NPS currently has no bonding and reclamation standards for mineral activity in connection with nonfederal minerals, other than oil and gas. Should individual NPS units authorize such activities under Special Use Permit, that permit should be used to specify the type and amount of bond that NPS requires and the conditions that constitute satisfactory reclamation.

The NPS may wish to accept, in lieu of a bond made out to the United States, evidence of a satisfactory bond posted with a responsible state or local agency. In any case, the NPS will require that the bond be made in the amount sufficient to achieve reclamation. The NPS may use the Special Use Permit to impose either the NPS' reclamation requirements or to accept the reclamation requirements of the responsible local or state agency, if those reclamation requirements protect park resources and values.

USES ASSOCIATED WITH MINERAL RIGHTS

Pipelines

Oil and Gas Pipelines. The Mineral Leasing Act prohibits the issuance of oil and gas pipeline rights-of-way across federal lands in NPS units [30 U.S.C. Sec. 185(b)]. In addition, the general right-of-way authority of the NPS (16 U.S.C. Sec. 5) does not provide for rights-of-way for oil and gas pipelines. Oil and gas pipeline rights-of-way may be issued only in those NPS units with authority for oil and gas pipeline rights-of-way in their enabling act. The enabling act for Lake Mead NRA does not provide such authority.

Oil and gas pipelines may be constructed on lands in NPS units that are open to federal mineral leasing, in connection with operations on federal oil and gas leases within the unit, to transport the oil and gas from the lease area. NPS will not treat these pipelines as rights-of-way but as part of operations on the lease.

Prior to NPS consenting to a federal oil and gas lease in an NPS unit the NPS must consider the needs of the lessee to transport the oil and gas from the lease. If the means and routes that a lessee would likely require to transport the oil and gas would result in a significant adverse effect on unit resources, then the NPS cannot consent to the lease under the regulations.

Oil and gas pipelines may be constructed in NPS units in connection with NPS approved nonfederal oil and gas operations. The regulations at 36 CFR Sec. 9B govern the conduct of operations in connection with such pipelines.

Rights-of-Way

Rights-of-way are governed by regulations which are set forth in 36CFR Part 14. Any rights-of-way nor clearly covered by the provisions of these regulations will be handled on a case-by-case basis.

Mineral Exploration

Federal Agency Mineral Assessments. The NPS will not approve or permit exploration, collection or assessments for federal minerals within NPS units by other federal agencies except where such assessments are authorized by law. The Director of the NPS specified in a memorandum dated October 9, 1981, that federal agencies, such as the U.S. Geological Survey or the Department of Energy, may conduct mineral resource surveys or assessments in units of the National Park System that are open to "regulated mineral entry," such as leasing of federal minerals. In such NPS units, the memorandum directs that all requests for mineral resource surveys by other federal agencies be forwarded to WASO for disposition on a case-by-case basis. (Such requests will be sent to WASO ATTN: Chief, Mining and Minerals Branch)

The memorandum of October 9, 1981 further requires that all requests for other federal agency mineral surveys are to be accompanied by a full plan of operations equivalent in content and scope to a plan required under 36 CFR Part 9.

Exploration by Mining Claimants. Operators on patented or valid unpatented mining claims within an NPS unit may explore to further define minerals discovered on their claims. Such exploration is an operation as it is defined in regulations at 36 CFR Part 9, Subpart A and must therefore be conducted only under an NPS approved plan of operations. All exploration in connection with claims is confined to the boundaries of the

claim(s).

Exploration by Federal Lessees. Unleased federal lands within NPS units may not be explored for oil and gas. In NPS areas, open to federal mineral leasing of oil and gas, lessees may explore for oil or gas on the lands within their lease. The regulations preclude the BLM from issuing a geophysical exploration permit for unleased oil and gas in an NPS unit, nor may the NPS permit exploration for unleased federal oil and gas within NPS units under some other instrument such as a Special Use Permit. Because exploration for federal minerals on unleased lands in an NPS unit is not permitted, the NPS may not allow such activities as "walk across" or "drive across" seismic surveys on federal lands that overlay unleased federal oil and gas within NPS units.

Geophysical exploration for oil and gas may take place on unleased public lands that are under the administration of the BLM. The party wishing to explore such lands must obtain a Geophysical Exploration Permit pursuant to 43 CFR Sec. 3045, and post a bond. This regulation applies only to public lands under BLM administration.

For solid minerals that are leasable under 43 CFR Sec. 3500, the BLM, with NPS consent, may issue prospecting permits on lands in NPS units that are open to leasing of federal minerals. Such a prospecting permit confers on the permittee exclusive right to explore for minerals. Upon the permittee's discovery of a valuable deposit, the BLM normally issues the permittee an automatic preference right lease. However, the guarantee of a preference right lease to a prospecting permittee is modified for federal minerals within NPS units open to lease. In NPS units open to lease, the NPS may issue the preference right lease only with NPS consent. If the NPS has determined No Significant Adverse Impact would result on NPS administered public lands, the BLM may issue an exploration license for known, unleased deposits of some solid leasable minerals. Exploration licenses may not be issued in NPS units, including those lands in NPS units that are open to lease. (51 FR 15211)

Exploration by Nonfederal Oil and Gas Owners. Operators in connection with nonfederal oil and gas rights within an NPS unit may conduct exploration in NPS units (for example, seismic lines or exploratory wells) in NPS units where Congress has provided for such activity, or, where not provided for, if it is not in derogation of park values and purposes. Such operations are conducted under an NPS approved plan of operations issued

pursuant to 36 CFR Sec. 9B.

All exploration in connection with nonfederal oil and gas rights within any NPS unit is confined to the surface lands that overlay the nonfederal oil and gas right unless Congress has provided for use and occupancy of other federal surface lands.

Exploration by Owners of Other Nonfederal Minerals. Persons who wish to explore for nonfederally owned minerals other than oil and gas that they own in an NPS unit, may conduct such exploration in an NPS unit where is authorized by law, or where not authorized by law, if it is not in derogation of park values and purposes. The NPS will authorize such exploration via Special Use Permit. All exploration in connection with nonfederal minerals, other than oil and gas, is confined to the surface lands that overlay the nonfederal mineral right unless Congress has provided otherwise.

Water Use

Mining Claims. The NPS may approve a plan of operations that proposes the use of water from a point of diversion which is within the boundaries of any unit if the right to the water has been perfected under applicable State law. The NPS is prohibited from approving a plan for an operation that proposes to use water from within an NPS unit to which the right has not been perfected (36 CFR Sec. 9.8). Since a perfected water right usually requires a state water use permit, the NPS will require a certificate of perfection (or equivalent document) issued by the state or evidence that the operator possesses a perfected water right.

Federal Mineral Leases. Congress has authorized federal mineral leasing in several NPS units if such leasing will not have a significant adverse effect on NPS administration or resources. Federal Mineral lessees may require water to develop the mineral lease. Thus, federal mineral lessees or permittees in NPS units may apply to appropriate water from points of diversion within an NPS unit under applicable state law. Each federal mineral lease or permit issued in NPS units open to lease provides for the NPS to have approval over all site specific activities. This includes the use of water in connection with the permit or lease. The NPS will further stipulate in every federal mineral lease or permit that "all rights to the use of water diverted to or used on federal lands in areas of the National Park System by the United States, its...lessees, or permittees shall be perfected in the name of the United States." (NPS Management Policies, IV-16).

Prior to the NPS consenting to the issuance of a federal mineral lease, the NPS must consider the lessee's need for water. If the use amount and source of water that the lessee likely requires

would result in a significant adverse effect on unit resources, then the NPS cannot consent to the lease under the regulations.

Nonfederal Oil and Gas Rights. "No nonfederal oil and gas operator may use for operations any water from a point of diversion which is within the boundaries of any NPS unit unless authorized in writing by the Regional Director. The Regional Director shall not approve a plan of operations requiring the use of water from such source unless the operator shows either that his right to the use of the water is superior to any claim of the United States to the water, or where the operator's claim is subordinate to that of the United States, that the removal of the water from the water system will not damage the unit's resources. In either situation, the operator must comply with the appropriate state water law." (36 CFR Sec. 9.35)

Access To Mineral Rights

The NPS may permit access across federal lands in NPS units under approved plans of operations for:

operators seeking access to mining claims within any NPS unit (with an approved plan of operations under 36 CFR, Sec. 9A);

federal mineral lessees or permittees seeking access to federal minerals in the NPS unit to which they have a lease or permit (with an approved plan of operations and a BLM issued lease or permit); and for

operators seeking access to nonfederal oil and gas within an NPS unit (with an approved plan of operations under 36 CFR, Sec. 9B).

The NPS may stipulate the means, routes and times of access that are permitted across NPS units. The NPS may approve access for the above mineral operators, on roads, jeep trails, or off-road routes and the NPS may approve land, water and air vehicles as means of access.

The NPS may approve a mineral operator's request for access to nonfederal minerals, other than oil and gas under a Special Use Permit issued either under the authority of the enabling act (for units with such authority) or under 36 CFR, Sec. 5.6(c). Such access shall be permitted only on "park area roads."

The NPS is required to permit road access to owners of nonfederal minerals, other than oil and gas, in situations where such access is the nonfederal mineral owner's right by statute or appurtenant to the nonfederal mineral owner's title to the property. However, the NPS is not obliged to issue permits that provide such access where it is not a right or where such road access does not exist, regardless of whether the nonfederal mineral is

within the park boundaries. (See NPS 53 Appendix XI)

The NPS may permit access across federal lands in NPS units for:

operators seeking access via foot, pack animal or designated road to claims outside an NPS unit (with an approved plan of operations under 36 CFR, Sec. 9A);

or operators seeking access via foot, pack, animal or designated road to nonfederal oil and gas rights outside an NPS unit (with an approved plan of operations under 36 CFR, Sec. 9B).

The NPS may not permit means of access, other than those means specified above, for operators seeking access across NPS units to claims or nonfederal oil and gas rights outside NPS units. A plan of operations is required for access by designated road.

The NPS may also permit access on park roads in NPS units, when necessary for persons to gain access to nonfederal minerals, other than oil and gas, adjacent to the park. Permits for such access are issued pursuant to 36 CFR, Sec. 5.6(c) and in accordance with NPS 53.

The NPS has no authority to issue rights-of-way for roads or trails in NPS units (outside Alaska).

STIPULATIONS

INTRODUCTION

Stipulations are used as part of an operation's approval document toensure that the resources and values of NPS areas are protected. Stipulations are specific requirements, based on mitigation measures that have been identified and developed in the NEPA process, that are inserted into mineral operation proposals for the purpose of preventing or mitigating the detrimental effects to park resources or visitors from these mineral operations. These stipulations do not stand alone, but must be based in some way upon the broader regulatory requirements which the NPS has at its disposal such as the Organic Act, area enabling act, Historic Preservation Act, Endangered Species Act, etc.

The purpose of this section of the minerals management plan is twofold: 1) to provide a general overview of stipulations, including their purpose, types, and relationship to regulations, and 2) to provide sample stipulations which may be referred to when preparing a list of stipulations for a particular proposed mineral operation.

Mineral operation proposals, plans, and applications can vary in form since there are many types of existing mineral interests throughout the National Park System and within many individual park units. The NPS can require that stipulations be added to proposals relating to mining claims, nonfederal oil and gas, and federal mineral leases, and may request that stipulations be included in external park proposals and proposals inside the park where the NPS has no jurisdiction (i.e., BIA Indian Trust Lands and nonfederal minerals other than oil and gas). Figure 1 summarizes the NPS use of stipulations.

NEPA requires that the NPS, when preparing environmental analyses (EA's or EIS's) for proposed mineral operations within park boundaries include "appropriate mitigation measures" where mitigation is defined as: "avoidance, minimization, rectification (repair, rehabilitation, restore), reduction over time, or compensation" (40 CFR 1502.14(f)). Additionally, NPS-12, the NEPA Compliance Guideline, states that "mitigation measures or conditions which likely would be imposed before a permit would be issued should be stated in NPS comments on the draft EIS" (chapter 7, page 10). These NPS comments would be particularly important in NPS reviews of other agency NEPA documents for proposed mineral operations adjacent to park boundaries.

Stipulations may only be applied to proposed operations that are legally permissible. It is important that STIPULATIONS ARE NOT PREPARED UNTIL IT IS ASSURED THAT THE PROPOSED OPERATION IS PERMISSIBLE UNDER LAW.

An example of an incorrect use of stipulations would be providing stipulations for a pipeline proposal (not associated with a 36 CFR 9B operation) across NPS lands - which is illegal. A thorough knowledge of not only NPS regulations, but also external agency regulations and procedures, is necessary to ensure park resources are adequately considered.

There are various types of stipulations that may be used. The key is flexibility. A stipulation that is used in Park A may have no applicability to Park B, even though the proposed mineral operation and commodity in each park are the same. Even within the same park, any given stipulation may not be applicable for two similar operations. Each mineral proposal will be different from other proposals and must be evaluated on an individual basis.

SURFACE LAND OWNERSHIP		MINERAL OWNERSHIP: FEDERAL — MINING* CLAIMS	FEDERAL — BLM ADMIN. LEASES	FEDERAL — BIA-INDIAN TRUST	NON-FEDERAL (State, local, tribal non-trust, private) — OIL AND GAS	NON-FEDERAL (State, local, tribal non-trust, private) — OTHER MINERALS (E.G., COAL)
WITHIN NPS UNITS	Federal	NPS requires stips in plan of operations	NPS requires stips in leases, permits	NPS requests stips	NPS requires stipulations in plan of operations	NPS requests stips by state, local, other fed. auth. (if any)
WITHIN NPS UNITS	Indian Trust			NPS requests stips		
WITHIN NPS UNITS	Non-federal	NPS requires stips in plan of operations	NPS requires stips in leases and permits	NPS requests stips	NPS requires stips if access is on, through, or across fed.-owned or controlled lands or waters	NPS requests stips by state, local, or other regulatory authority, if any exist
OUTSIDE NPS UNITS	Federal					
OUTSIDE NPS UNITS	Indian Trust					
OUTSIDE NPS UNITS	Non-federal (state, local, non-trust, private)					

NPS REQUESTS STIPULATIONS BY OTHER AUTHORITIES*******

Note: The Fish and Wildlife Service and the Advisory Council (or SHPO) may require stipulations on all above proposals.

* Includes both patented and non-patented mining claims, which are regulated by 36 CFR 9A.

The interrelationships of environmental parameters must also be considered. A stipulation imposed to protect one parameter may adversely affect another.

The last part of this section offers various sample stipulations that have been used by federal and state agencies, including the NPS. They are not standard stipulations that must be applied in every case. They are offered rather as examples which may assist park staff in considering appropriate mitigation measures, and subsequent stipulations, that may be required to protect park resources.

Following are seven types of stipulations, with descriptions and examples, that may be considered and have been applied to proposed mineral operations (adapted from "Mitigating Impacts of Mineral Development on NPS Lands", unpublished draft 1988)

Resolving Data Inadequacies

- often required to meet statutory requirements
  requires applicant to collect specific data
- monitor impacts of operations
- obtain baseline data

Examples:

"The lessee is required to inventory the lease area for desert tortoise habitat and, if any such habitat is found, to conduct tortoise inventories, all in accordance with the guidelines. In the event that tortoise occurrence is identified, the lessee will be required to adhere to any suggested modifications in the mining operation provided by the Fish and Wildlife Service and the BLM."

"The lessee is required to establish and maintain a weather station conforming to National Weather Service standards for collecting daily precipitation, wind direction and force, and maximum and minimum temperatures. Reports of these observations shall be submitted to the superintendent at the end of each month of operations.

Alerting Regulators and Potential Operators to Problem Areas (raising red flags)

- identify potential environmental problems associated with a specific area (e.g., wildlife resources, air quality, water quality, noise intrusion, etc.)
- common usage

Example:

"The lease contains high priority habitat for migrating birds of high federal interest (Ferruginous hawk nest sites and buffer zones) ... This area is unsuitable for seismic operations unless the BLM and the Fish and Wildlife Service concur that seismic exploration under the plan of operations will not disturb the birds during the breeding season."

Resolving Conflicts

- stipulations developed jointly by the regulator, potential operator and others (environmental groups, state agencies)
- a form of conflict resolution

Example:

"The lessee will not operate ore trucks or other heavy equipment on access roads between local sunset and sunrise to eliminate noise annoyance in residential areas adjacent to the recreation area."

Detailing Mitigation Techniques

- most common
- detail particular mining, reclamation or mitigation technologies or methods
- sometimes too rigid and remove the flexibility needed to adapt to new data and changes in technology or methodology (especially if applied at the more general planning phase)

Example:

"The lessee shall be required to mitigate for bighorn sheep habitat loss where applicable and the resultant loss or displacement of this species due to mining operations."

"The habitat recovery and replacement plan shall indicate the methods to be employed by the lessee which will ensure that the recovered or replaced land has the capacity to support this species, as determined by NPS and BLM in consultation with the U. S. Fish and Wildlife and the game divisions of the states of Arizona and Nevada."

Setting Targeted Performance Levels

- common
- sets limits on acceptable performance
- specifies that violations of the performance limits constitutes a violation of the approved plan

- allows the operator the flexibility to meet the performance levels and use changing technology and methodology

Example:

"The operator shall demonstrate a 90 percent vegetative cover, with no one species accounting for more than 20 percent of the overall cover, with 80 percent of the original species diversity, and exhibiting only native species of plants. Three years after the final reclamation efforts and upon a showing of the operator that reclamation meets these standards the operator's reclamation bond will be released."

Excluding Areas From Mining

- establish buffer zones around sensitive areas
- specify particular types of impacts that are not allowed
- no surface occupancy

Example:

Required 500' set back from recreational area boundary to prevent new access to the recreation area from adjacent lands.

Spacing By Time

- allows full development of the mineral resource over an extended period of time
- reduces impacts to resources
- allows greater flexibility
- has limited applications for use for long-term operations

Example:

"A maximum of two production well pads will be allowed in this management zone at any given time. Once production and reclamation operations are completed, the NPS will consider new operations within this management zone."

GENERAL OPERATIONAL CONSIDERATIONS

The technologies of exploring for and developing minerals have some elements that are predictable. The types of activities conducted will depend on whether the minerals sought are fluid or solid. The following considerations may help in the formulation of mitigation measures and lead to the development of stipulations:

1. Seismic or other surface exploratory activities are usually of short duration and can be seasonally controlled.

2. Equipment exists which exerts low psi on sensitive vegetation and land surfaces.

3. Exploration wells have a 1 in 10 chance of becoming producers.

4. The drilling of exploratory wells may be seasonally controlled.

5. Producing wells can be active for the life of the field and cannot be shut down seasonally.

6. A producing field can be active for 60 years or more.

7. Well sites may require (on the average) four acres or more for siting of the pad and support facilities.

8. Roads will be necessary for access to well sites and facilities.

9. Drill muds, formation waters, brines, and other pollutants may be present and therefore toxic waste disposal needs to be considered.

10. Pipelines may be necessary and corridors can be 50-75 feet wide (requiring large crews and heavy equipment).

11. Pipelines can be buried or sited above ground.

12. Support facilities may not have to be sited on park lands.

13. Depending on the breadth, depth and location of the mineral formation, directional drilling can be employed.

14. Blowout prevention equipment exists and must be employed.

15. Accumulations of volatile methane or poisonous (H2S) gases are possible and should be considered.

16. Fires, from flaring, are a consideration in managing fluid mineral activities.

GENERAL ENVIRONMENTAL PROTECTION CONSIDERATIONS

From the previous operational considerations, several environmental protection considerations need to be addressed. The following major classes of mitigation should be considered in designing language for protective stipulations:

1. Minimizing, containment, accidental dispersal controls, and safe disposal of toxic wastes.

2. Siting negotiations between the surface manager and the lessee or contractor.

3. Protection of watersheds and prevention of pollution to water resources. Water resources will be reverted to natural processes upon project termination (i.e., remove diversion structures or installed spring caps).

4. Provisions for erosion, sedimentation, and flood control.

5. Protection of air quality.

6. Seasonal control of the conduct and intensity of operations in sensitive areas.

7. Provisions for protecting surrounding timber or brush from fires.

8. Provisions for restoration, reclamation, and rehabilitation. Stipulations may be stated in general revegetation terms or may specify use of indigenous species or genetic stock.

9. Surface and/or subsurface inventories and studies may be necessary to identify and protect cultural or archeological resources in the immediate or adjacent development sites.

10. Provisions for protecting endangered or threatened species, either by spatial or temporal restrictions on operations will be necessary.

11. Appropriate bonding requirements should be considered.

12. Controlling the number of individuals allowed access to particularly sensitive areas and consideration of controlling the timing of that access.

13. Siting of roads, support facilities, pipeline corridors, pump stations, and possible routes of access by small fixed wing or helicopter aircraft will have to be assumed and areas temporally or spatially restricted for access to these activities.

14. Directional drilling technologies may be applied to reduce surface disturbances.

15. Aesthetic considerations may require facilities to be camouflaged or be subject to special design for appropriate blending with natural surroundings.

16. Restricting placement of structures where there is a potential for slumping soils or where slopes may exceed a prescribed percentage.

17. If equipment must cross streams or other surface features that cannot withstand disruption, provisions for angles of crossing or restricted access should be considered. Weight and size limitations must be considered.

IMPACTS AND MITIGATION TECHNIQUES

Enclosed in a map packet at the back of this document are two charts (Figure 2 and 3) which describe the impacts to the environment caused by general mining activities, and the mitigation measures which may be applied.

Mineral development activities have been categorized into four broad sources for ease of illustration and analysis: surface disturbance, mining facilities, mobile equipment, and waste disposal. Environmental parameters have been divided into six major resource categories, also for ease of illustration and analysis, but are not all inclusive. For example, cultural resources, although of concern, are not listed as a category but are included in the sample stipulations section at the end of this section. The six environmental parameters are included in Figures 2 and 3 to emphasize the interrelationships between them. One source of mining activity may impact all environmental parameters and the application of one mitigation technique, although beneficial to one parameter may seriously impact another.

The impacts chart (Figure 2) includes those impacts that are most commonly associated with mining activities. They are not all-inclusive but should provide the reader with basic understanding of the multitude and type of impacts that could occur. The mitigation measures chart (Figure 3) describes common techniques that may be applied to prevent or lessen the effects of the impacts described in Figure 2. Again, they are not all-inclusive

but provide a general overview. As mentioned in the introduction, the key to using mitigation techniques (included in permit documents as stipulations) is flexibility.

A coded reference to the sample stipulations found in the last section of the NPS this document Migitating Impacts of Mineral Development on National Park Service Lands (draft, June, 1988) is located at the bottom of Figure 3.

SAMPLE STIPULATIONS

The following stipulations are only examples to indicate the nature and the degree to which stipulations can vary. these samples are intended to be used by park staff to aid in the preparation of stipulations for proposed mineral operations. For ease of identification and use, the stipulations are divided into generalized categories as to the type of impact or resource that is to be mitigated or protected. The chart identifying mitigation measures (Figure 3) lists the stipulations which could be applied to protect the resources or to mitigate the impacts to the resources. Not all of the sample stipulations listed below are referenced in Figure 3. Some stipulations by their nature can be applied generically to a mineral operation, for example, the stipulations listed under the General category. These sample stipulations in no way represent an all inclusive list of stipulations which can be applied to a mineral operation.

General

1. The operator, in conducting activities approved in a plan of operations, shall comply with all federal, state, and local laws, regulations, and ordinances applicable to the area or activities covered by the plan of operations and provide an affidavit specifying such compliance.

2. Approval of this plan of operations for _____ does not in any way constitute approval of any subsequent operations.

3. The operator will exercise diligence in protection from damage the land and property of the United States covered by and used in connection with this plan of operations and will pay the United States for any damage resulting from the violation of the terms of this plan of operations or any law or regulation applicable to the national parks by the operator, his agents, or employees, or through negligence of the operator, his agents, or employees, when acting within the scope of their employment.

4. The area headquarters will be contacted by the operator or his designees prior to entering or leaving the unit.

5. Operators and their employees are subject to all the rules and regulations of the NRA while within the boundaries of the area.

6. The use of approved access routes to the site of operations will be limited to the operators authorized personnel and official government personnel conducting plan of operations monitoring and compliance inspections.

7. To protect the _____, the use of access roads will be restricted to authorized personnel only for the purpose of conducting approved operations, or monitoring activities to ensure plan of operations compliance. Other activities other than access to the site of operations will be prohibited. Work crews will be prohibited from carrying firearms while working in the NRA. No dogs will be permitted at residential camps or the site of operations.

8. The operator will be responsible for controlling unauthorized use of any new access road for the life of the road's purpose.

9. Activity coordination to minimize impacts, special conditions, such as unitization, may be applied to limit the spread of surface disturbance over time and space.

10. Formal programming to increase operators' awareness of NPS concerns will be implemented.

11. Operations will be located or scheduled to avoid major recreation use and hunting areas and periods.

Visual

1. All plastic flagging, stakes, and other temporary markers put in place by the operator will be removed from the park.

2. All trash and debris resulting from the operations shall be removed from the park on a daily basis.

3. Keep access routes and areas of use clean of all garbage and foreign debris, and dispose of debris and garbage in an acceptable manner.

4. No accessory work trail road, earth cut or fill, structure or other improvement, other than an active drilling rig, will be permitted if it can be viewed from _____(location)_____.

permanent facilities will be painted or camouflaged to blend with the natural surroundings. The point selection or method of camouflage will be subject to the approval of the Superintendent, Lake Mead NRA.

6. All equipment and vehicles shall be confined to the designated access road and pad.

7. All electrification will be by buried cable unless there are overhead powerlines in the immediate area.

Area Restrictions

1. The no surface occupancy stipulation is used to protect important resources identified in the resource utilization zone. The stipulation will not apply to casual or other uses which would not significantly disturb surface resources, such as geophysical surveys conducted by nonmotorized surface methods.

2. No occupancy or surface disturbance will be allowed within _____feet of water courses.

3. No occupancy or other surface disturbances will be allowed on slopes in excess of _____%.

4. All mineral operations will be prohibited within:

   ____feet from designated habitat
   ____feet from 100 year floodplains

5. Exploration activity will be limited to existing roads and trails due to the presence of _____(specific wildlife)_____.

6. Directional drilling techniques will be required when multiple wells are needed to develop nonfederal oil and gas rights.

7. The activity coordination stipulation will be attached to all plans of operations approved by the National Park Service if the site of operations is within lands recommended by wilderness classification or lands used by threatened or endangered species, such as the _____. This stipulation will indicate that the proposed operations would affect lands with resource values sensitive to high or intensive levels of activity. To minimize impacts on the specified resource values, special conditions, such as limitations to disperse surface disturbance activities over time and space may be required as a condition for plan of operation's approval.

Seasonal Restrictions

1. Road and utility construction must be planned to avoid sensitive wildlife areas.

2. Activities (specified) will only be allowed during (dates), dry periods, etc.

3. Exploration, drilling, or other activity may be prohibited during muddy or wet periods. This limitation does not apply to maintenance and operation of producing wells.

4. Surface occupancy will be restricted during periods of critical bighorn sheep use, and to provide minimal disturbance to deer habitat and forage.

5. During the period of winter bighorn sheep lambing (dates) these lands (described) will be closed to surface occupancy by any activities related to oil and gas exploration, including seismic lines, off-road vehicle use, road construction, equipment moving, and drilling. This limitation does not apply to maintenance and operations of producing wells.

Access

1. Where possible, existing pad and access roads will be used for operations in lieu of creating new surface disturbance to develop oil and gas facilities.

2. All new oil and gas access roads will be:

   Located in the least environmentally sensitive areas to avoid degradation of habitat for threatened or endangered species.

   Designed and constructed to minimize hydrologic impacts.

   Restricted in use to the intended purpose.

   Removed as soon as possible following its need for service and reclaimed to discourage invasion by exotic plants.

3. -_____(Specific road)_____will not be used as an access road for activities on this lease.

The susceptibility of certain soils to wind or water erosion necessitates the use of special tires wide/balloon on off-road vehicles on those spots. The use of ORV's may be prohibited in other areas because of highly unstable soils (requiring aircraft-helicopters).

4. For projects requiring long term surface occupancy, access roads will be upgraded and maintained as necessary to prevent soil erosion and accommodate year round traffic.

5. Avoid crossing drainages where possible; adequate culverts, bridges, and bulkheading can maintain waterflows and prevent erosion.

6. Motorized vehicles will not be used off of designated public roads or approved access routes in conjunction with approved operations. Existing off-road vehicle trails will be used where feasible to minimize new surface disturbance.

7. The operator will use foot access or nonmotorized ground access methods to transport personnel, geophones, cable, and other equipment across areas identified as important resource areas, or other undisturbed areas to avoid degradation of wildlife habitat important to the _____. In such areas, the use of hand-portable drills is required and vegetation clearing will be done by hand. Trails will not be wider than needed to allow access by a person on foot.

Health and Safety

1. Fencing and signs warning of potentially toxic H2S (cyanide, methane, etc.) gas concentrations shall be places so as to warn wandering visitors and operator employees of the danger. The operator must maintain the signs from vandalism and loss.

2. Proper breathing apparatus must be available and used when working in an H2S environment exceeding 20 ppm.

3. A wind sock must be placed on the tank battery as to be visible from everywhere on the location.

4. The reserve pit must be fenced.

5. No firearms or unleashed dogs will be allowed.

6. Blasting operations shall be conducted according to the guidelines set forth by MSHA (Mining Safety and Health Administration, U.S. Department of Commerce). A certified blaster shall be in charge on site for all blasting operations. Blasting materials shall be stored in magazines as specified by MSHA requirements and shall be clearly marked, fenced and secured as required in MSHA regulations. At the end of blasting operations all blasting materials shall be removed from the site.

Technology

1. The reserve pit must be lined with _____mil thick plastic to prevent leaching of chemicals into soils and groundwater.

2. Containerized mud system. A closed or containerized mud system is required in lieu of using reserve pits to minimize surface disturbance and the risk of ground and surface water contamination.

3. A dike capable of containing at least 1.5 times the volume of crude stored on the site must be constructed around each well.

4. Four well casings are required for protection of surface and groundwater supplies.

5. Internal corrosion of well casings will be controlled by continuous injection of chemicals and monitored by ultrasonic inspection, corrosion coupon surveys, and water sampling.

6. Buried flow lines will be protected against external corrosion by plastic coatings and cathodic protection devices, periodically dug up at selected points, and examined by x-rays or inspected internally.

7. Automatic well shutdown devices will be used to shut off oil flows in response to pressure changes.

8. Oil and gas wells must have fail-safe, ball-type, remote control subsurface safety valves.

9. Blowout preventer assemblies designed to preclude gushers and leaks.

10. All produced salt water must be returned underground via injection wells. Under no conditions may salt water be released on the ground surface. Underground disposal of produced salt water is limited to zones of lesser water quality than the produced water.

11. Abandoned wells must be properly plugged. All access roads and drill pads must be removed after oil exploration and production activities are finished.

Reclamation

1. All shot holes will be backfilled with drill cuttings and native materials, and mounded over the hole to allow for eventual subsidence.

2. Ruts and vehicle tracks will be raked or scraped to restore the ground surface to the contour of the surrounding area. No fill materials will be brought into the area.

3. Reclamation will be conducted on a contemporary basis with the operations, or no later than 30 days following the completion of operations, excepting inclement weather conditions. Park headquarters will be contacted upon completion of reclamation work by telephoning during normal business hours.

4. All available topsoil materials will be saved and stockpiled for use in reclamation. The soil stockpiles will be protected during operations from losses due to runoff and erosion.

5. A reclamation plan is a required element of each proposed plan of operations. Each reclamation plan must meet the requirements specified by 36 CFR 9.39. These requirements vary according to whether the federal government owns the surface estate. In situations where the surface estate is federally-owned, the operator must take steps to restore natural conditions and processes. These steps must include:

   a. Removal of all above ground structures, equipment, and roads used for the operations, unless otherwise authorized by the National Park Service.

   b. Removal of all debris resulting from the operations.

   c. Removal or neutralization of any toxic or contaminating substances.

   d. Plugging and capping all nonproductive wells.

   e. Filling dump holes, reserve pits, ditches, and other excavations.

f. Restoring the site of operations to its original grade and slope.

g. Replacing native topsoil materials.

h. Revegetation of the site using native plant materials.

To be acceptable, the reclamation plan must provide for safe wildlife movements, successful re-establishment of plant communities, normal flows of surface waters, reasonable flows of groundwater, and site restoration to a condition that does not jeopardize visitor safety or public use.

6. Mulch with ___ tons of stray or ___ tons of grass hay. Apply mulch and anchor 2-3 inches deep by disking the mulch into the soil prior to seeding. Disk and drill on the contour on slopes and at right angles to prevailing wind on level areas.

7. Drill seed on the contour at a depth of _____.

8. Seed all disturbed areas using the following seed mixtures:

9. Complete fall seeding after (date) and prior to ground frost. To be effective, complete spring seeding after the frost has left the ground and prior to (date).

10. Slopes too steep for machinery can be seeded by hand-broadcasting and raked into the soil at double the recommended seed rate.

11. Construct and maintain the fence around the entire location until effective vegetation cover has been established.

12. Disk and seed the access road with the same mixture recommended in _____.

13. All rehabilitation work (including seeding) will be completed by (date).

14. The species diversity of the reclaimed areas shall achieve at least three cool season perennial grasses and one perennial forb with relative cover equal to or greater than three percent of the total cover. The combined relative cover of three cool season perennial grasses and forb should not exceed 80 percent and no one species should comprise greater than 60 percent of the total cover.

15. The operator shall measure woody plant density and vegetation cover on the reclaimed areas the first and third growing seasons following reclamation at intensities equal to baseline sampling levels and submit the results to the agency within 60 days after data collection.

Noise

1. All machinery and vehicles must be equipped with the best available noise suppression devices.

2. Engines powering drilling rigs or production equipment will be muffled so that the decibel level will not exceed _____ when measured 50' from the source.

3. Activities that generate loud noises (greater than 70 decibels) when proposed within three miles of bald eagle nests will be evaluated for their impacts and if necessary, prevented during the nesting periods.

Fire

1. During periods of serious fire danger to forest, brush, or grass, the lessee or permittee shall prohibit smoking and the building of open fires except in designated safe places.

2. No burning of rubbish, trash, or other flammable materials is allowed except if authorized.

3. The operator shall take all reasonable precaution to prevent and suppress wildland fires. In connection with the operations as approved by the National Park Service, fire prevention and suppression equipment as required by the National Park Service shall be provided. During times of high or extreme fire danger, operations may be temporarily suspended at the discretion of the superintendent.

4. Operations will be scheduled or located to avoid periods or areas of extreme or high fire danger.

5. Continuous gas monitoring devices will be installed in all enclosed areas to decrease the likelihood of fire.

Water

1. The area contains waters that are critical to the survival of various wildlife species. Therefore, additional protection measures may be applied, which include:

a. No use of local water sources.

b. No surface occupancy on some or all of the adjacent lands within one mile of local water sources.

c. Limitations on the type of equipment that may be used.

d. Restriction of activities during certain times of the year.

2. The operator must assure that any water appropriated for mitigation does not result in a shortage in the area from which the water is taken.

3. A culverting plan of adequate design and construction will be implemented to minimize the impacts of access road development on surface water flows.

4. Culverts must be placed under access roads as needed to sustain flow in natural drainages.

5. The grantee shall minimize erosion at all river and stream crossings by using or constructing approach ramps at 90 degree angles to the watercourse. Under no circumstance will fill material be placed in a river or stream when operating in a floodplain.

6. Drainages shall not be blocked or filled with loose dirt or debris. All drainage crossings shall be properly excavated and/or have a culvert of sufficient size installed to adequately carry the peak flow of the drainage.

7. The culvert invert(s) shall be installed at the elevation of the natural streambed. The up and down stream fill slopes will be riprapped with a well graded mixture of rock sizes containing no material greater than two feet or smaller than three inches. The ratio of maximum to minimum dimension of any rock shall not exceed 6:1.

8. Oil spill cleanup equipment (pumps, skimmers, and absorbents) and emergency personnel must be on hand and available for immediate mobilization.

9. Knowledge, availability, and implementation of an efficient contingency plan by all involved parties is a must.

10. Low-impact techniques should be used; avoid use of dispersants, emulsifiers, and other chemical agents.

11. Dispersal techniques may be necessary to discourage use of the area by wildlife and waterfowl (gas-operated horns, etc.).

12. Emphasize measures for avoiding accidental spills and leachate contamination, rather than measures to mitigate the effects of these problems after they occur.

13. Contingency plans for handling accidental spills can specify:

    a. Methods for locating the source of the discharge.

    b. How the discharge will be stopped.

    c. How the spill will be contained.

    d. Responsibility for and techniques employed in repair, cleanup, and monitoring.

14. Limit use of poisonous substances, including pesticides, herbicides or fungicides, and use only after full evaluation of possible effects and obtaining necessary approval.

15. Become familiar with the levels of pollutants allowed in the discharge from various types of surface mines. Guidelines have been published by the U.S. Environmental Protection Agency (40 CFR 434; 40 CFR 440; 40 CFR 436).

Pipelines

1. Pipelines must be located so as to facilitate the containment and cleanup of spilled hydrocarbons. Where feasible, pipelines must be located on the upslope side of roads and pads unless the NPS determines that an alternatives site is an acceptable environmental alternative.

2. Pipelines will be used for the transport of oil. Trucking may be used to transport oil only from points in close proximity to a major road.

3. Where possible, access corridors and pipelines will be contiguous and designed so that collector lines would be located in access road rights-of-way to storage tanks or tank batteries. Where reasonable and prudent alternatives exist, access corridors will not be developed into or through important resource areas. Access corridors will be maintained to avoid potential safety hazards resulting from impaired visibility and potholes. Access corridors will also be maintained to avoid encroachment by exotic plant species.

Vegetation

1. Marred or wounded standing trees will be treated with a commercially available, nontoxic pruning paint or wound coating.

2. Vegetative clearings for roads, pads, and other above-ground structures will be located to avoid areas identified as important resource areas.

3. Vegetative clearings for roads, pads, and other above-ground structures will have free form, irregular lines and feathered edges.

4. All trees requiring removal shall be disposed of by the operator. Where earth blading is required, stumps shall be removed and scattered or buried in an area designated by the NPS. Where earth blading is not required, stump height shall not exceed 12 inches. All slash less than four inches in diameter will be chipped, scattered outside the cleared area, or stockpiled for use during reclamation. All material four inches in diameter and greater will be removed from federal land unless otherwise directed.

5. Use brush blades rather than dirt blades to preserve natural grass and low brush cover in areas where clearing rather than excavating is necessary for operation.

6. Maintain vegetation around bodies of water and along all perennial streams and waterways that will not be used in operating the mineral development.

Cultural

1. The operator may be required to conduct an inventory of the site to be disturbed to determine the presence of cultural resources. This inventory must be done by, or under the supervision of a qualified archeologist approved by the National Park Service. The National Park Service will specify those cultural resources requiring protection or the mitigation measures required for cultural resource protection.

2. The operator shall bring to the attention of the National Park Service significant cultural resources encountered in areas to be disturbed, for evaluation and for instructions as to the appropriate action to be followed by the operator.

3. The operator shall immediately cease operations in areas in which any antiquities or other objects of historic or scientific interest are discovered and bring the discovery to the attention of the National Park Service. Any such discoveries shall be left intact until the operator is permitted to proceed by the National Park Service.

4. Operations will be located to avoid known or apparent archeological sites. The NPS will be notified within 24 hours if possible new archeological sites are discovered.

Wildlife

1. The operator, prior to conducting any surface-disturbing activities, may be required to conduct an examination of the area of operations to develop information required by the National Park Service to determine effects on any plant or animal species listed or proposed for listing as threatened or endangered, or their habitat. This examination must be done by or under the supervision of a qualified expert approved by the National Park Service. The findings of this examination may result in some restrictions to the plan of operations, or disallow any use and occupancy that would jeopardize the continued existence of threatened or endangered species.

2. Mineral operations will be located or scheduled to avoid:

   a. Known bald eagle nesting sites. The National Park Service will be notified immediately if apparent nesting sites are observed.

   b. Buffer zones recommended by the National Park Service or resource experts to minimize disturbance to sensitive wildlife.

   c. Seasons, periods, or times of critical wildlife use, by threatened or endangered species, such as nesting, breeding, and birthing.

3. Seismic operations will not be allowed during the bald eagle nesting season in areas identified as having known active bald eagle nests. If an active bald eagle nest is discovered within three miles of a seismic line, activity will be halted during the nesting season within a three-mile radius of the nest.

4. Sensitive wildlife areas must be screened from mining activities through the use of vegetation and topographic features.

5. Minimum flight elevations must be established for aircraft over sensitive wildlife areas, particularly during exploration or surveying activities.

6. Fences must be kept at a minimum on big game migration routes.

7. Fences must be designed and located to accommodate the natural movement of big game animals, unless specifically designed to prevent access by wildlife to hazardous areas (such as reserve pits).

8. Road construction must be planned and constructed to minimize the likelihood of vehicle/wildlife collisions.

9. Minimize traffic during early morning and late evening hours, especially during critical migration periods.

10. Install road caution signs indicating wildlife crossing areas and establish appropriate speed limits.

11. Properly design and locate powerlines to reduce transmission line/bird collisions and electrocution. Consider underground placement of these lines in particularly sensitive areas.

Air Quality

1. Equip machinery and vehicles with the best available gaseous emission suppression devices.

2. Sprinkle water or oil on roads and trails at _____(frequency)_____ to minimize fugitive dust.

3. Cover conveyor belts especially in critical wildlife areas.

4. Cover areas prone to wind erosion with mulch, straw, or matting material to prevent fugitive dust.

Waste Disposal

1. All solid wastes will be removed from the preserve and disposed of at facilities specially designed to accommodate such wastes.

2. Dispose of all solid and liquid wastes containing potential contaminants or injurious material in a manner that will not harm surface or ground water. Isolate potentially toxic leachates of minerals, overburden, waste rock, and soil storage and disposal piles to prevent contamination of the soil and ground and surface waters. Point-source discharges from mine dewatering and mineral processing waste water are controlled directly by the Federal Government. The EPA manual, "Water Quality Guidance for Mine-Related Pollution Sources (New, Current and Abandoned)" (WPD 7-77-01, U.S. EPA Office of Water Planning and Standards, Washington, D.C.), lists 17 "control" principles to use in the selection and design of site-specific pollution preventive measures and control practices.

ABANDONED MINERAL PROPERTIES

BACKGROUND

Considerable mining has taken place in the Lake Mead area. An Abandoned Mining Lands (AML) inventory conducted in the early 1970's identified over 100 open abandoned mine sites, including shafts, tunnels, pits, etc., with in the park boundaries. Dangerous mine shafts identified at that time were fenced.

In spite of these efforts, Lake Mead NRA is one of the two NPS units with the dubious distinction of having had a fatality associated with an abandoned mine site. The results of this case as well as similar cases on BLM lands, dictate that a reasonable and orderly approach to abandoned mine safety is necessary to reduce agency liability. To further address these issues, the park is currently developing a detailed abandoned mine land program.

INVENTORY

The first step in the abandoned mine lands program will be to update the AML inventory to better characterize the site and to identify natural resource and safety issues associated with each site. This inventory should include: location, site characterization (description of the physical attributes of each site), historic and cultural resource survey, wildlife inventory, reclamation needs, and visitor safety concerns. The inventory should also include any park-specific considerations, e.g., interpretive value of the site, visitor use characteristics, etc.

A historic resources study was completed in 1983 that analyzed the historic significance of abandoned mines in the Lake Mead NRA. This document identified sites eligible for inclusion in the National Register of Historic Places. Sites not eligible for inclusion in the Register may be considered for closure.

SITE PRIORITIZATION

Once having completed the inventory described above, park staff will prioritize the sites for ultimate treatment. These treatments can be either permanent or temporary, and include but are not limited to closure, stabilization, placement on historic register, reclamation, maintenance as wildlife habitat and/or interpretation.

Site prioritization is a three-step process. First, health and safety concerns are rated based on the potential for injury, access and visitation, remoteness or closeness, difficulty or risk involved in rescue on each site. Second, the natural and cultural resource impacts of the abandoned site are ranked, e.g., water contamination, soil or vegetation disruption, heavy metal or acid leaching, disturbed historic fabric, etc. And third, once having identified the safety and health and natural/cultural resource problems with each site, the park will then consider the cultural and natural resource values of the site, e.g., historic significance, wildlife habitat, and interpretive values.

CLOSURE/PLUGGING

Once the site prioritization process is completed, selected sites will be identified for closure or plugging. Depending on the site involved, such closure may be permanent, e.g., backfilling or blasting, or temporary, e.g., fencing, netting, or signing. The park's ability to implement the closure and plugging program that is developed is dependent on availability of staff and financial resources.

MONITORING CLOSURES AND PLUGGINGS

A critical element of any abandoned mine lands program is the monitoring of closures and other treatments. The monitoring portion of the AML program will measure the on-going effectiveness of the selected treatment.

All temporary closures, e.g., netting, bat gates, fencing, etc., are subject to deterioration and vandalism. These sites should be inspected on a routine basis, at a minimum of annually. Sites that are expected to receive high visitation and therefore subject to potential vandalism should be inspected more frequently, e.g., quarterly. The park should also identify those AML sites which are likely to be impacted by natural phenomenon, e.g., flash flooding, and schedule more frequent monitoring. Even permanent closures, e.g., sites that have been backfilled or blasted, may be subject to subsidence, slope failure, erosion, etc.

In addition, all sites (temporary and permanent) must be monitored to determine the success or failure of reclamation efforts. This information can guide future reclamation efforts, and identify failures or problem areas that need further action.

FUTURE MINING ACTIVITIES

The park's abandoned mine land program will address all currently existing abandoned mine sites within the park. Future mineral development in the park will be regulated as discussed in Chapter II of this procedures document. New operators and/or lessees will be required to submit a plan of operations prior to developing their site, part of which details reclamation and abandonment procedures

TYPICAL MINING SCENARIOS

OIL AND GAS

Seismic/Access

Seismic exploration is the most commonly used technique in oil and gas exploration. Seismic surveys give precise details on the structures and stratigraphy beneath the surface. Data is collected by creating vibrations, and recording the return vibration at various intervals along the surface. The exploration program consists of an energy source (drill-hole drilling of explosive), shock wave detectors (geophones), and a recording truck. The return shock waves are detected by a series of geophones strung in a line away from the charge. The geophones are connected by cable or radio transmitter to the recording truck. Details of a maximum seismic operation are outlined below.

Survey Size. 20 miles

Access. Principal access is by 10-foot bladed roads (1.2 acres/mile). Access to more remote areas is by helicopter.

Size of Operation. Work force includes 20 individuals. Instrument site for trucks, equipment and helipad requires one acre. Each shot-hole blast will disturb 1/4 acre.

Duration. The operation will have one 12 hour shift on a daily basis for approximately six months.

Water Usage. Approximately 250 gallons of water will be used per day for domestic use.

Hazardous Materials. 200 pounds of dynamite with a one month supply of blasting caps will be stored on site. No diesel, gasoline or fuel for helicopters will be stored on site. It will be transported to the site on an as needed basis.

Waste Disposal. Refuse will be removed from the work site daily. All sewage will be disposed of in portable toilets or field latrines.

Visual Impact. Visual impact will be temporary due to the movement of the equipment and operation along the survey line. Usage of the helicopter will be more intrusive due to its airborne operation and its increased noise levels and visibility. Access roads will be longer lasting and will be quite visible during the seismic survey and until reclamation is complete.

Air Quality. Access roads will emit 22 pounds of fugitive dust per vehicle mile. See Equipment Needs below for emission levels.

Reclamation. Access roads and shot-hole sites will be recontoured and topsoil replaced. Compacted surfaces will be ripped. Revegetation will consist of native plant seed and transplant stock. The reclaimed areas will be mulched to retain moisture and prevent soil erosion. Where necessary, the mulch will be crimped or netted and the area fenced.

Equipment Needs. One low boy truck making two trips per day. Fuel consumption will be at the rate of ten gallons per hour. 1.3gm per mile of particulates and 28.7gm per hour of CO will be emitted.

Three 1-ton trucks will make four trips per day per vehicle. Fuel consumption will be at the rate of ten gallons per hour. Emissions will be at the rate of .34gm per mile for particulates and 84gm per mile for CO per vehicle. Noise levels will meet or exceed 75 dBA.

Five 3/4-ton pickup trucks will make six trips per day per vehicle. Fuel consumption will be at the rate of five gallons per hour. Emissions will be .34gm per mile for particulates and 80gm per mile for CO per vehicle. Noise levels will meet or exceed 50 dBA.

One D6 or equivalent dozer will be used eight times each shift. Fuel consumption will be at the rate of six gallons per hour. Emissions for particulates will be .165 pounds per hour and .739 pounds per hour for CO. Noise levels will be 79 dBA.

One 6-place helicopter will make eight trips per day. Emissions for particulates will be .8 pounds per hour and for CO five pounds per hour. Noise levels will be 88 dBA.

One truck mounted small drill rig will be used each 12 hour shift. Fuel consumption will be at the rate of ten gallons per hour. Particulate emissions will be .165 pounds per hour and CO emissions will be .739 pounds per hour. Noise levels will meet or exceed 90 dBA.

Exploratory Drilling/Access

An exploration well is drilled primarily for the purpose of determining that oil and gas actually exists in a subsurface rock formation. Based upon data retrieved from a seismic survey operation, it is only an educated guess as to whether or not oil and gas is present in a formation. It is only after a well is drilled into the formation that the presence of oil and gas can be confirmed or denied. Details of maximum exploration drilling is outlined below.

Access. A 20-foot wide all-weather gravel road is constructed to the site (2.4 acres per mile).

Size of Operation. 12 individuals make up the work force. The well pad will encompass 1 3/4 acres.

Depth. Exploration drilling would penetrate to an expected maximum depth of 22,000 feet.

Duration. Two 12-hour shifts per day seven days a week for approximately six months.

Water Usage. Drilling operations can be expected to consume 15,000 gallons of water per day. Domestic use will use approximately 525 gallons per day. Dust control measures will utilize approximately 1500 gallons of water per day.

Hazardous Materials. 2,000 gallons of diesel fuel and 50,000 gallons of drilling fluids will be stored onsite. A two week supply of drilling additives will be stored onsite.

Waste Disposal. Refuse is stored on site and will be hauled away for disposal on a weekly basis. Sewage will be pumped from portable toilets once per week. Drill cuttings are stored in the reserve pit with the drilling fluids. Oil from the well is stored in the reserve pit until removed by vacuum trucks (5 trips/well). Natural gas is vented to the atmosphere or flared if the quantity so dictates.

Visual Impact. The derrick will be the most visible structure at the site. It will be visible from the air and other vantage points. Warning lights are placed at the top of the derrick for aircraft night flights. The site is well lighted for 24 hour operation, so it will be very visible at night. Access roads will be noticeable throughout the life of the operation and until reclamation is complete.

Air Quality. Access roads will emit 22 pounds of fugitive dust per vehicle mile. Each well site will emit approximately .575 tons of fugitive dust per six month operation. See Equipment Needs for emission levels.

Reclamation. Upon completion of drilling and abandonment of the site, all surface facilities will be removed and disposed of offsite. All access roads and the drill pad will be recontoured. The reserve pit will be cleaned out and filled with uncontaminated fill. The surface will be ripped to relieve compaction and the topsoil will be replaced. Revegetation will consist of native plant seed and transplant stock. The site will be mulched to retain moisture and prevent soil erosion. Where necessary the mulch will be crimped or netted and the area fenced.

Equipment Needs. One flat bed truck making 40 trips over the life of the operation. Fuel consumption will be at the rate of ten gallons per hour. Particulate emissions will be 1.3gm per mile and CO will be emitted at the rate of 28.7gm per hour. Noise levels will approximate 90 dBA.

One 100-barrel vacuum truck will make 10 trips to the site and will consume approximately ten gallons of fuel per hour. Emissions and noise levels will be the same as above.

One sanitation truck will make 24 trips. Fuel consumption will be five gallons per hour. Emissions will be 34gm per mile for particulates and 80gm per mile for CO. Noise levels will be 75 dBA. Five 3/4-ton pickup trucks will make 2 trips per day per vehicle. Each vehicle will consume five gallons of fuel per hour, .34gm of particulates will be emitted per mile and 80gm of CO will be emitted per mile. The noise level will be approximately 50 dBA.

One 1-ton logging truck will make two trips and consume ten gallons of fuel per hour of operation. Emissions for particulates will be .34gm per mile and 84gm per mile for CO. Noise levels will approximate 75 dBA.

One D8 or equivalent bulldozer will operate for 15 days to clear access roads and the well site. Fuel consumption will be at the rate of 11 gallons per hour. Particulate emissions will be .54 pounds per hour and CO emissions will be 1.76 pounds per hour. Noise levels will meet or exceed 79 dBA.

One rotary drilling rig will operate 24 hours per day for the life of the operation. Noise levels will meet or exceed 90 dBA.

Two 320kw generators will operate 24 hours per day for the life of the operation. Nine gallons of fuel will be consumed per hour. Emissions for particulates will be .94gm per hour and CO will be 3.1 pounds per hour. The decibel level will meet or exceed 85.

One 1350hp mud pump will operate for the duration of the operation. Particulate emissions will be at the rate of 2.68 pounds per hour. Emissions for CO will be 8.34 pounds per hour. Noise levels will be 91 dBA.

Development/Production/Product Transport

As the development phase begins, the discovery well is tested to isolate and analyze the producing zones and is completed as a production well. Additional wells are drilled to maximize production of the field. The number of wells and production rate depends upon several factors, including but not limited to the size of the field, oil gravity, flow rate of the oil, and depth of the producing zone. An oil and gas field developed for maximum production is based upon one well per 40 acres for oil and one well per 640 acres for gas. At this spacing an oil and gas field would average 15 wells producing 300 barrels per day. Drilling operations would be similar to the details of the oil and gas exploration drilling scenario described previously.

Production deals with bringing the oil and gas to the surface and prepartion for the trip to the refinery or processing plant. To bring the oil and gas to the surface each well is equipped with some form of artificial lift, most commonly a type of pump, if the fluids cannot be brought to the surface by natural reservoir energy. A sucker rod pump utilizes surface equipment while other pumping methods will use equipment submerged in the well or a combination of both surface and submersible equipment.

Well floods once brought to the surface will be processed through various ground equipment (separators, heaters, treaters, stock tanks) usually on the site for separation and treatment. A network of flow lines is constructed to connect the wells with various tanks and treating vessels.

Roads will be constructed to service well sites and other field facilities. Roads to stock tanks will be all-weather roads due to frequent use by tanker trucks and other equipment. Transport of oil and gas from the stock tanks will normally be accomplished through the use of tank trucks. Roads to well sites will be built to accommodate light duty trucks. Details of a maximum production and transport scenario are outlined below.

No. of Wells in Field. 15 wells.

Production Rate. 300 barrels of oil per day per well.

Access. 20-foot wide all-weather gravel road (2.4 acres per mile) to stock tanks and 20-foot wide gravel road to other field facilities.

Size of Operation. Three person work force once field is in production. Each well site will occupy approximately 1/4 acre, each stock tank will need 1/2 acre.

Duration. Field equipment will operate 24 hours per day for an expectant field life of 30 years.

Product Transport. Well fluids are transported from the wellhead to stock tanks by two inch collector pipes.

Hazardous Materials. Oil products will be stored in 500-barrel stock tanks until transported. Gas products, if in small quantities will be vented or flared. If gas is in commercial quantities it will be piped directly to pipelines for transport.

Waste Disposal. Refuse will be removed by workers on a daily basis. Sewage will be disposed of in a field latrine and pumped as required.

Visual Impact. Visually disturbed area totals approximately 20 acres, including access roads, pipelines, well pads, and stock tanks. Visual intrusion will last for the life of the field and will be visible from vantage points.

Air Quality. Access roads will emit 22 pounds of fugitive dust per vehicle mile. Lesser amounts of fugitive dust will be emitted from equipment sites. For emissions see Equipment Needs below.

Reclamation. At the end of the field life all surface facilities, including equipment, refuse, wastes, fencing, and other materials will be removed and disposed of offsite. As access roads, well sites, and stock tank sites will be recontoured, any water pumps will be cleaned out and filled with clean fill material. Topsoil will be replaced and soil compaction will be relieved by ripping. Revegation will be accomplished by seeding of native plant species and transplant stock. The area will be mulched to retain moisture and to prevent soil erosion. Where necessary the mulch will be crimped or netted and the area fenced.

Equipment Needs. 15 flat bed trucks will be used to transport equipment and materials to the site. Fuel consumption will be ten gallons per hour per vehicle. Particulate emissions will equal 1.3gm per mile and CO will be emitted at the rate of 28.7gm per hour. Noise levels will equal 90 decibels.

One 3/4-ton pickup truck will make two trips to the field per week. Five gallons of fuel per hour will be consumed. Emissions for particulates will be at the rate of .34gm per mile and for CO 80gm per hour. Decibel levels will be 50.

One 2 1/2-ton utility truck will make two trips per week to the field. Ten gallons of fuel per hour will be consumed. Particulate emissions will be .91gm per mile and 42.9gm per hour for CO. Noise levels will equal 93 dBA.

15 15hp oil pumps will operate 24 hours per day for the life of the field. Power source will be electricity. Noise levels will equal or exceed 82 dBA.

OTHER MINERALS

Exploration/Access

A mineral exploration drilling program will use truck-mounted drill rigs capable of drilling to 5000 or more feet. Core rigs will be used to recover core samples for metallic minerals exploration, while rotary drill rigs will be used to explore for uranium. The truck-mounted drill rigs can move about rather easily in the field, minimizing the need for roads. Drill sites will be prepared to accommodate the drill rig, drill steel, water truck, and other support equipment. Reclamation will be done after drilling is complete. A maximum exploration drilling program will involve up to 50 drill holes. Details of such a program are outlined below.

Access. Ten-foot wide bladed road, 1.2 acres per mile disturbed.

Size of Operation. Workforce of 12 individuals required. Each drill site will require 800 sq. feet.
Duration. One 12-hour shift per day for eight months.

Product Transport. Core samples will be boxed and drill cuttings will be sampled in the field and transported to the lab by 3/4-ton pickup truck.

Water Usage. Drilling operations will require 6000 gallons of water per day. Domestic use will require 200 gallons per day. To control dust, water will be spread at the rate of 12,000 gallons per week.

Hazardous Materials. 1500 gallons of diesel fuel and 250 gallons of gasoline will be stored onsite.

Waste Disposal. Refuse will be stored on site and will be hauled off for disposal upon completion of drilling at each site. Portable field latrines will be used for sewage and emptied weekly. Drillings will be stored in mud pit and buried upon drilling completion.

Visual Impact. Visual intrusion will be short term. Access roads will be visible during program operation and until reclamation is complete. Drill sites and access roads will be visible from the area and other vantage points.

Air Quality. Access roads will emit 22 pounds of fugitive dust per vehicle mile. For other emissions see Equipment Needs below.

Reclamation. Drill holes will be plugged between aquifers with concrete. The hole will be filled with cuttings within five feet from the top. The last five feet will be with concrete. Each hole is marked to identify the company, hole number, and hole location. All access roads and drill sites will be recontoured to originalcontours. Compacted surfaces will be ripped and the topsoil replaced. Revegetation will be completed by reseeding with native species and transplant stock. The sites will be mulched to retain moistureand prevent soil erosion. When necessary the mulch will be crimped or netted and fenced.

Equipment Needs. One lowboy truck to transport equipment to each drill site. Ten gallons of fuel will be burned each hour. Emissions for particulates will be at the rate of 1.3gm per mile and 540gm of CO each hour of operation. Noise levels will be 98 dBA.

Two 2500 gallon water trucks will make 4 trips per each drill site. Fuel consumed will equal ten gallons per hour. Emissions will equal 1.3gm per mile for particulates and 540gm per hour for

CO. Decibel levels will be 90.

One 1500 gallon fuel truck for diesel will make one trip per week. It will consume eight gallons of fuel per hour of operation. Emissions and decibel levels will equal those of the water trucks.

Two 3/4-ton pickup trucks will make six trips per day and consume five gallons of line per hour. Emissions will be .34gm per mile for particulates and 80gm per hour for CO. Noise levels will be 50 dBA.

One 2 1/2-ton truck will make one trip per week. Fuel consumption will be at the rate of eight gallons per hour. Particulates will be emitted at the rate of .91gm per mile and CO emissions will be 42.8gm per hour. Noise levels will equal 90 dBA.

One backhoe will operate for eight hours per drill site. Four gallons of fuel will be consumed for each hour of operation. Particulate emission will be .09 pounds per hour and CO emissions will be .58 pounds per hour of operations. Noise levels will be 80 dBA.

One D6 or equivalent bulldozer will operate for four hours at each drill site. Each hour of operation will consume six gallons of fuel, emit .21 pounds of particulates, and .31 pounds of CO. Noise levels will be 79 dBA.

Two truck-mounted drill rigs will operate 12 hours per day at each site. Ten gallons of fuel will be consumed for each hour of operation. Particulates will be emitted at the rate of .165 pounds per hour and CO will be emitted at the rate of .739 pounds per hour. Decibel levels will measure 90.

Breccia Pipe Uranium Mining

Breccia pipe deposits are presently being mined and developed in the eastern portion of Lake Mead NRA. Maximum production from a breccia pipe underground uranium mine operation can be expected to be 500 tons per day. Such a mine is developed from a central shaft and will have a life of approximately ten years. Details of the maximum development of a breccia pipe uranium mine is outlined below.

Production. 500 tons per day

Access. Mine site access will be by a 30-foot wide all-weather gravel road disturbing 3.6 acresper mile.

Size of Operation. A work force of 45 individuals will be employed for the life of the operation. The mine site will occupy eight acres at the surface.

Duration. Two work shifts per day will be scheduled over the life of the mine (ten years).

Product Transport. Ore is transported from the mine to the stockpile site by 35-ton ore haulers where it will then be loaded onto 35-ton trucks for transport to the mill site.

Water Usage. The mine will use 7500 gallons of water per day. Dust control measures will require 2500 gallons a week. Domestic use will require 50 gallons of water per individual per day.

Hazardous Materials. 8,000 pounds of ammonium nitrate will be stored on site. A one month supply of blasting supplies will also be stored. 7500 gallons of diesel fuel and 250 gallons of gasoline will be stored at the mine site. Approximately 2000 tons of stockpiled ore will be onsite.

Waste Disposal. Refuse will be hauled away once a week. All sewage will be disposed of in an onsite septic system. Runoff water will be collected in ponds to settle out suspended solids. Mine discharge water will be pumped to an evaporation pond. Waste rock and low grade radioactive waste will be placed in the waste pile.

Visual Impact. Visual intrusions will last for the life of the mine and until reclamation is complete. Surface facilities being highly visible will be buildings, headframe, and mobile equipment. The mine site will consist of evaporation ponds, graded sites, and access roads. The entire surface mine complex will be visible from the air and other vantage points. The headframe will extend 80 feet in height.

Air Quality. Access roads will emit 22 pounds of fugitive dust per vehicle mile. See Equipment Needs below for other emission levels.

Reclamation. At the end of the project all surface facilities including equipment, refuse, fencing and other materials will be removed and disposed of offsite. Access roads, waste piles, facilities sites, surface mined areas, and other disturbed areas will be recontoured to original contour lines. Revegetation will be accomplished through seeding of native species and transplant stock. The mine site will be mulched to retain moisture and to prevent soil erosion. The mulch will be crimped or netted and the area fenced where necessary. All subsurface mining areas will be stabilized to prevent subsidence, slumping, and mine drainage contamination of underground water resources.

Equipment Needs. One transport truck will make one trip to the mine site per week. Fuel consumption will be ten gallons per hour of operation. Particulate emissions will equal 1.3gm per mile traveled and CO will be emitted at the rate of 28.7gm per hour. Decibel levels will measure 90 dBA.

One lowboy will be required to make eight trips to the mine site. Ten gallons of fuel will be consumed per hour of operation. Emission levels will be 1.3gm per mile traveled for particulates and 540gm per hour of operation for CO. Noise levels will be 98 dBA.

One 35-ton ore truck will operate for four hours per day. Fuel consumption will be at the rate of ten gallons per hour. Emission levels for particulates will measure .68 pounds per hour and CO will measure 2.35 pounds per hour. Noise levels will be at the rate of 110 dBA.

Sixteen 35-ton highway ore trucks will operate for 12 hours per day. Each vehicle will consume fuel at the rate of ten gallons per hour of operation. Particulate emissions will measure 1.3gm per mile traveled and CO emissions will be 540gm per hour of operation. Decibel levels will equal 98 dBA.

One 500-gallon water truck will operate eight hours per week and will consume eight gallons of fuel per hour of operation. Emission levels for particulates and CO will equal those of above. Decibel levels will measure 85 dBA.

One 35-passenger bus will make two trips per day. Eight gallons of fuel will be consumed per hour of operation. Emissions for particulates will be .34gm per mile traveled and 80gm per hour operated for CO.

Three 3/4-ton pickup trucks will operate for four hours per day. Five gallons of fuel will be consumed per hour of operation. Emission levels for particulates and CO will equal those of above. Noise levels will measure 50 dBA.

Two 2 1/2-ton trucks will be operating four hours per day. Six gallons of fuel will be consumed per hour of operation. Emission levels will measure .91gm per mile for particulates and 42.8gm per hour for CO. Noise levels will be at the rate of 90 dBA.

One D8 or equivalent dozer will operate four hours per day and fuel consumption will be at the rate of 11 gallons per hour. Emissions for particulates will be .54 pounds per hour and for CO

1.76 pounds per hour. Noise levels will measure 100 dBA.

One 980 or equivalent wheeled loader will operate four hours per day. Fuel consumption will be nine gallons per hour of operation. .75 pounds of particulates will be emitted per hour. CO will be emitted at the rate of 2.6 pounds per hour. Noise levels will measure 100 dBA.

One road grader will operate eight hours per week. Fuel consumption will equal five gallons per hour. Emission levels will measure .17 pounds per hour for particulates and .6 pounds per hour for CO. Noise levels will be 98 dBA.

Two 3-yard load-haul-dumps will operate for eight hours per week. Seven gallons of fuel will be consumed per hour of operation. Emission levels will be at the rate of .16 pounds per hour for particulates and .62 pounds per hour for CO. Decibel levels will measure 101 dBA.

Three air leg drills will be in operation four hours per day. Noise levels will equal or exceed 115 dBA.

Two 50hp fans will operate 24 hours per day. Noise levels will measure 89 dBA.

One 400kw generator will operate 24 hours per day. Fuel consumption will be ten gallons per hour. Emission levels for particulates will be 1.16 pounds per hour of operation and for CO will be 3.8 pounds per hour of operation. Noise levels will measure 80 dBA.

One 160cfm air compressor will be in operation 16 hours per day. Fuel will be consumed at the rate of two gallons per hour. Particulate emissions will be 2.2 pounds per hour and CO emissions will be 3 pounds per hour. Noise levels will be 98 dBA.

One 100hp shaft hoist will operate 16 hours per day. Noise levels will measure 87 dBA.

Cyanide Heap Leaching

The cyanide heap leaching operation is relatively simple in design and construction. Earthwork is necessary to prepare the base pad by stripping the topsoil and other material. The finished pad will have a slope between two to ten percent to promote internal drainage. Earthwork is also necessary to construct process ponds and safety ponds. Liners for the pad and ponds will be installed to prevent contamination of underground water sources. The mined ore is prepared onsite by crushing to

increase the surface area. Heaps will be loaded with 5,000 tons of ore by dumping from front end loaders. The heaps will be leached for 45 days. The spent ore will then be removed to a tailing disposal area and the pad is prepared for another cycle of leaching.

The leaching solution will be mixed in a makeup (barren) pond by adding caustic to water at a rate of 50 pounds caustic per 1000 gallons of water. Sodium cyanide is then added by direct dumping at the rate of .5 to 1.5 pounds per 240 gallons of solution. The resultant solution concentration will range from about 125 ppm to 350 ppm free cyanide.

The rate of consumption of sodium cyanide will range from .1 to three pounds per ton of ore and the rate of consumption for the caustic will range from two to three pounds per ton of ore.

The heaps are sprayed with the solution of sodium cyanide (barren solution) which will percolate through the heaped ore. Application rate will range from five to 80 gallons per day per square foot. "Pregnant" solution is collected in lined channels at the toes of the heaps and is directed to ponds. The process solutions will be recycled. The pregnant solutions will be processed in carbon absorption columns onsite. The carbon is stripped and the metal ore is recovered by electromining.

The ore to be processed will be made available from the 60,000 ton per year operation outlined in the section on Surface Mining of Metallic Minerals. Details of a maximum cyanide heap leaching operation is outlined below.

Production. 60,000 tons of ore will be processed per year.

Access. Access will be by a 20-foot wide, all-weather gravel road. The road will disturb 2.4 acres per mile.

Size of Operation. Eight individuals will make up the workforce. The heap leaching complex will cover 20 acres.

Duration. One shift per day will be scheduled for five years.

Product Transport. The prepared ore is transported to the heap pads by front-end loader. The recovered metal ore is transported by pickup for further refining offsite.

Water Usage. The initial use of 12,000 gallons of water for the leaching solution will be recycled for the life of the operation.

An additional 200 gallons of water will be used per day to maintain the leaching solution. Domestic use will be 80 gallons per day. Dust will be controlled by the spreading of 2,000 gallons per week over the site.

Hazardous Waste. 200 pounds of sodium cyanide will be stored onsite. 120 tons of lime will be used per year and stored onsite. 1000 gallons of diesel fuel and 250 gallons of gasoline will be stored onsite at any one time. 6,000 gallons of barren cyanide solution and 6,000 gallons of pregnant cyanide solution will be stored onsite.

Waste Disposal. Refuse will be stored onsite and hauled away for disposal on a weekly basis. Sewage will be stored in portable toilets and pumped once per week for disposal offsite. Cyanide solution will be neutralized with chlorine as hypochloride to less than .02 ppm CN. It will be allowed to evaporate in ponds. Containers used to store sodium cyanide will be rinsed and disposed of offsite. The rinsing solution will be recycled into the leaching process. Leached ore will be washed with water and dumped in a spoil pile.

Visual Impact. Surface facilities include ore crushing and stockpiling equipment, ore stockpiles, heaps, storage basins, metal recovery equipment, ponds, and various buildings. The tallest structure onsite will be 30 feet high.

Air Quality. Access roads will emit 22 pounds of fugitive dust per vehicle mile. For other emission levels see Equipment Needs below.

Reclamation. All surface equipment will be removed and disposed of offsite. All disturbed areas will be recontoured to original contours and topsoil will be replaced. Revegetation will be by seeding of native plant species and transplant of native stock species. The area will be mulched to retain moisture and to prevent soil erosion. The area will be crimped and netted, and fenced where necessary.

Equipment Needs. One flat bed truck will make six trips to the site over the life of the operation. Fuel consumption will be at the rate of ten gallons per hour. Emissions will measure 1.3gm per mile for particulates and 28.1gm per hour for CO. Noise levels will measure 90 dBA.

One lowboy will make four trips to the site over the life of the operation. The rate of fuel consumption will be ten gallons per hour of operation. Emissions will measure 1.3gm per mile for particulates and 540gm per hour for CO. Noise levels will measure 90 dBA.

One 2500-gallon water truck will make two trips per week. Fuel consumption, emissions, and noise levels will equal those of above.

One 1500-gallon fuel truck will make one trip per day each. Fuel consumption, emissions, and noise levels will equal those of above.

Five 3/4-ton pickups will make three trips per day each. Rate of fuel consumption will be five gallons per hour. Emissions will measure .34gm per mile for particulates and 80gm per hour for CO. Noise levels will measure 50 dBA.

One 2 1/2-ton delivery truck will make one trip per week. Rate of fuel consumption will be eight gallons per hour. Emissions will measure .91gm per mile for particulates and 42.8gm per hour for CO. Noise levels will measure 90 dBA.

One D6 or equivalent bulldozer will operate for 40 hours per month. Fuel consumption will be at the rate of six gallons per hour. Emissions will measure .21 pounds per hour for particulates and .31 pounds per hour for CO. Noise levels will measure 79 dBA.

One 980 or equivalent loader will operate for 100 hours per month. Fuel consumption will be at the rate of nine gallons per hour. Emissions will measure .75 pounds per hour for particulates and 2.6 pounds per hour for CO. Noise levels will measure 84 dBA.

One 230kw generator will operate 20 days each month. Rate of fuel consumption will be ten gallons per hour. Emissions will measure .66 pounds per hour for particulates and 2.18 pounds per hour for CO. Noise levels will measure 75 dBA.

METALLIC MINERALS

Underground Mining

The underground metal mining scenario addresses small underground operations opened in existing abandoned mines. This type of mining activity is encouraged primarily because of high metal prices and poor economic conditions. An underground mining operation is usually not operated consistently, but will be

operated for short periods of time as funds are raised. The ore is hoisted to the surface through the shaft and then hand sorted. The concentrated ore is then trucked for processing offsite. The maximum scope of underground mining operation to occur is one mine producing approximately 1500 tons of ore per year. The details of such an operation is outlined below.

Production. 1500 tons of ore per year.

Access. Access will be by a ten-foot wide all-weather road; 1.2 acres of land disturbed per mile.

Size of Operation. Workforce will employ two individuals. The surface mining operation will occupy three acres.

Duration. One shift per day will be employed for six months of the year over three years.

Product Transport. Mined ore will be transported to the underground bin by a diesel powered mucker. The hoist will lift the ore from the bin to the surface where it will be loaded onto 5-ton dump trucks for transport to the smelter.

Water Usage. The mining operation will utilize 100 gallons of water per day. Domestic use will use 100 gallons of water per day. Dust abatement will require the spreading of 1000 gallons of water per month.

Hazardous Materials. 100 pounds of dynamite will be stored on site. 200 gallons of diesel fuel and 50 gallons of gasoline will be stored onsite.

Waste Disposal. Refuse will be stored onsiteand be removed once a month for disposal. Portable field latrines will be used for disposal of sewage. All mine waste will be placed in the existing mine dump.

Visual Impact. New visual intrusions will be held to a minimum due to mine development occurring at existing abandoned sites. Utilization of existing structures is favored. Mine operation and facilities will be visible from the air and other vantage points.

Air Quality. Access roads will be responsible for the emission of 22 pounds of fugitive dust per vehicle mile traveled. For other emissions see Equipment Needs below.

Reclamation. All access roads, mine dumps, spoil piles, and other disturbed areas will be recontoured to original contours. Native plant species will be reseeded and used for transplant stock where appropriate. The mining complex area will be mulched

to retain moisture and to prevent soil erosion. Where necessary, the mulch will be crimped or netted and the area fenced.

Equipment Needs. One 500 gallon water truck will make one trip per week to the mine site. Eight gallons of fuel will be consumed per hour of operation. Emission rates for particulates will equal 1.3gm per mile and for CO will equal 540gm per hour. The noise level will measure 85 dBA.

One 5-ton dump truck will make 300 round trips per year to the mining operation. Ten gallons of fuel will be consumed per hour of operation. Emissions for particulates will equal .91gm per mile traveled and CO will measure 238gm per mile traveled. The noise level will measure 90 dBA.

One 3/4-ton pickup truck will make one trip per day. Fuel consumption will be at the rate of ten gallons per hour of operation. Emissions will be .34gm per mile for particulates and 80gm per hour for CO. The noise level will be 50 dBA.

A one yard loader will operate four hours per day and fuel consumption will be at the rate of five gallons per hour. Emissions for particulates will measure .12gm per hour and CO emissions will measure .4gm per hour. The noise will measure 97 dBA.

One underground air drill will operate four hours per day. The noise level will measure 114 dBA.

One 160cfm compressor will operate four hours per day and will consume two gallons of fuel per hour. Emissions will measure 2.2 pounds of particulates per hour and three pounds of CO per hour. The noise level will be 75 dBA.

One 100kw generator will operate 12 hours per day. Fuel consumption will be five gallons per hour of operation. Particulates will be emitted at the rate of .219gm per hour and CO will be emitted at the rate of .72 pounds per hour. The noise level will be 75 dBA.

One 50hp fan will operate 12 hours per day. The noise level will be 89 dBA.

Surface Mining

Surface mining activities are concentrated in historic mining areas where high-grade deposits were mined underground leaving low-grade, disseminated deposits intact. Present surface mining operations will involve the working of these low-grade deposits. The maximum surface mining operation can be expected to extract 60,000 tons per year. The mined ore will be processed onsite by cyanide heap leaching (details in previous section entitled Cyanide Heap Leaching), on at mill sites outside the NRA. Details for a maximum surface mining operation are outlined below.

Production. 60,000 tons per year.

Access. 20-foot wide, all-weather gravel road, disturbance will be 2.4 acres per mile.

Size of Operation. A workforce of eight individuals will be necessary for the life of the operation. The surface mining operation will occupy 20 acres.

Duration. One shift per day for five years.

Product Transport. The mined ore will be transferred from the mine site to the processing site by a ten-ton dump truck.

Water Usage. 3,000 gallons of water will be used per day to control dust. Domestic use by the workforce will be 80 gallons per day.

Hazardous Materials. 2000 pounds of bagged ammonium nitrate will be stockpiled onsite. A one month supply of blasting caps will be on-hand. 5,000 gallons of diesel fuel and 250 gallons of gasoline will be stored onsite.

Waste Disposal. Refuse will be stored onsite and will be hauled away for disposal once per week. Sewage will be stored in portable toilets and will be pumped for disposal once per week. All waste rock will be trucked for disposal to the mine dump once per week.

Visual Impact. The surface mining operation will be visible from

the air and from other vantage points. Access roads and mining facilities will be a visual intrusion for the life of the operation and until reclamation is complete.

Air Quality. Access roads will emit 22 pounds of fugitive dust per vehicle mile traveled. For other emission levels see Equipment Needs below.

Reclamation. All surface facilities including equipment, refuse, waste, fencing, and other materials will be removed and disposed offsite. All areas with surface disturbance will be recontoured to original contours. Revegetation will be accomplished by the reseeding of native species and the use of native transplant stock. All areas will be mulched to retain moisture and to prevent soil erosion. When necessary, the mulch will be crimped or netted and fenced.

Equipment Needs. One flat bed truck will make three trips per month to the mine site. Fuel consumption will be ten gallons per hour of operation. Emissions for particulates will measure 1.3gm per mile and CO will measure 28.1gm per hour. Noise levels will measure 90 dBA.

One lowboy will make six trips per the life of the mining operation. Fuel consumption per hour of operation will be ten gallons. Particulate emissions will be the same as above and CO emissions will measure 540gm per hour. Noise levels will be 98 dBA.

One 2500-gallon water truck will make two trips per day and consume ten gallons of fuel per hour of operation. Emissions will measure the same as for the lowboy. Noise levels will be 90 dBA.

One 2500-gallon fuel truck will make one trip per week. Fuel consumption, emission levels and noise levels will be the same as for the water truck.

One ten-ton dump truck will be making 40 trips per day. Fuel consumption will be ten gallons per hour of operation. Particulate emissions will be .91gm per mile and emissions for CO will be 238gm per mile. Noise levels will be 93 dBA.

Five 3/4 ton pickups will make three trips each per day. Each pickup will consume five gallons of fuel per hour. Particulate emissions will equal .34gm per mile and emissions for CO will be 80gm per hour. Noise levels will be 50 dBA.

One D6 or equivalent bulldozer will operate 60 hours per month. Fuel consumption will be six gallons per hour. Emission levels for particulates will be .21 pounds per hour and .31 pounds per hour for CO. Noise levels will measure 79 dBA.

One 980 or equivalent wheeled loader will operate 100 hours per month. Fuel consumption will be nine gallons per hour. Emissions for particulates will measure .75 pounds per hour and for CO 2.6 pounds per hour. Noise levels will be 100 dBA.

One road grader will operate ten hours per month and consume five gallons of fuel per hour. Emissions for particulates will be .17 pounds per hour and for CO .6 pounds per hour. Noise levels will measure 90 dBA.

One air track drill will operate 80 hours per month. Noise levels will measure 114 dBA.

One 760cfm compressor will operate 80 hours per month and consume four gallons of fuel per hour. Emissions for particulates will measure 4.4 pounds per hour and for CO will measure 4 pounds per hour. Noise levels will measure 75 dBA.

One 100kw generator will operate 12 hours per day. Five gallons of fuel will be burned per hour of operation. Emissions for particulates will be .29 pounds per hour and for CO will be .95 pounds per hour. Noise levels will be 75 dBA.

As the nation's principal conservation agency, the Department of the Interior has basic responsibilities to protect and conserve our land and water, energy and minerals, fish and wildlife, parks and recreation areas, and to ensure the wise use of all these resources. The department also has major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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