

Arizona State Land Department

Documentation Guidelines and Requirements
for
Mineral Operations On Arizona State Trust Lands

Mineral Development Report

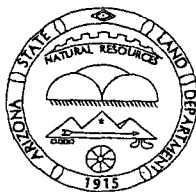
Part I: Technical Analysis

Geologic Evaluation
Economic Feasibility

Part II: Environmental Assessment

Part III: Operations and Planning

Mine Operating Plan
Reclamation & Closure Plan



Note

It is recommended that you do not proceed with the in-depth development of this report until the technical merits of your proposed mining operation are reviewed with the Department.

**Documentation Guidelines and Requirements
for
Mineral Operations On Arizona State Trust Lands**

Mineral Development Report

A Mineral Development Report (MDR) is required by the Arizona State Land Department for all mining operations on state Trust lands. *Guidelines* for preparing this report are contained in this publication. The MDR provides the Department with the essential information required for the effective evaluation of mineral lease applications, and the responsible management of mineral leases. The Department's review of the report and its subsequent recommendations on the granting of the mineral lease will be based on the technical and analytical data presented in the MDR. While a professional geologist or consultant is not necessarily required for compiling this report, it is important to understand that the MDR is a detailed, technical document that the Department expects to be technically sound and professionally prepared and presented.

It is the applicant's responsibility to assure the reports technical completeness, accuracy, clarity, and soundness. The Department recommends that you do not proceed with the in-depth development of this report until the technical merits of your proposal are reviewed.

Efforts have been made to design the MDR in scope, not only to address the requirements of the Department, but provide essential information to assist the applicant in obtaining permits required for the proposed mining operation.

CONTENT: The topical outline contained in this publication is intended to serve as the report's **Table of Contents**. All topics in the outline are to be addressed in the report. Topics listed in the outline that do not apply to your operation should be addressed in the report with a brief statement as to why the topic does not apply. Topics essential or unique to your operation that are not itemized in the outline, or that do not fit appropriately into the categories provided, can be added as needed to provide additional support and clarification to your proposal.

You are encouraged to contact the Department's Minerals Section to discuss or clarify report requirements and expectations.

For any mining or mineral lease application to be approved, the applicant must provide sufficient technical detail to demonstrate the presence of a *valuable mineral deposit or resource*. The level of technical, economic and operational detail required naturally depends on the deposit type, scope, and size of the proposed mining operation. Each section of the report should be based upon explicit, verifiable, complete, and defensible data. Mineral resource estimates, estimation methods, and economic calculations should be clearly presented to enable the reviewer to understand the basis for resulting values, assertions and conclusions.

As stated above, the Department's review of the report and subsequent recommendations on the granting of the Mineral lease will be based on the technical data presented by the applicant.

It is equally important that fundamental, sensitive environmental issues and impacts be identified in the

Environmental Assessment section. Proposed mitigation measures of these environmental issues should be individually discussed and cross-referenced in the Mine Operating Plan and/or the Reclamation and Closure sections.

CONFIDENTIALITY: Confidential information required for this report should be submitted under separate cover and plainly labeled as **CONFIDENTIAL**. Confidential data (pursuant to A.R.S. §27-239(F), A.R.S. §27-252, and A.R.S. §27-274) should only be used in summary form in the primary report and cross-referenced to the details maintained and protected separately from the public document.

For information to be considered confidential, the applicant or lessee must formally request in writing that information be kept confidential with justification.

REPORT STRUCTURE: The Mineral Development Report consists of three, tightly integrated functional parts divided into five major sections. **Part I** includes a **detailed Technical Analysis consisting of the: 1) *Geologic Evaluation and, 2) Economic Feasibility.*** **Part II** includes section 3 which consist of an ***Environmental Assessment.*** **Part III** applies the technical and environmental data from Parts I & II to **Operations and Planning** which include the: **4) *Mine Operating Plan and 5) Reclamation & Closure Plan.***

Each section should be developed as an independent report. Since each proposed mining operation is unique, situations may arise during the evaluation process that require portions of the Technical Analysis, or other report sections, be submitted individually before completion of the final report. Upon completion, all report sections will be combined into a final report.

PRESENTATION REQUIREMENTS: For consistency, the Department requests that you follow the presentation standards included at the end of this publication. The MDR should be prepared and presented in a professional manner.

EVALUATION PROCEDURES: The Department has standardized it's evaluation procedures and approach in order to help expedite processing of mineral lease applications. The Department considers development of the MDR to be a cooperative effort, where the applicant, their consultants, and the Department communicate closely throughout the report's development. A pre-meeting with the applicant is recommended to discuss application evaluation requirements and procedures.

Essential to the approval process are technical conferences (minimum two) involving all parties involved in the report preparation. The first conference should be scheduled shortly after the filing of the application, if not before. The primary purpose of the first conference is to: 1) discuss the Department's application evaluation process and procedures, 2) review preliminary lease stipulations and terms, 3) establish contacts and lines of communications between Client, Consultants and the Department, 4) develop a tentative timeline or evaluation schedule, 5) identify known unique, key, sensitive environmental, land-use, and operational issues, 6) assign responsibilities, and 7) plan a scope-of-work and approach to permitting.

The second technical conference will focus on the Department's review of the draft MDR. The purpose of this conference is to provide the fine-tuning required for the final report.

Early identification of sensitive issues, as well as the determination of all federal, state, county, and city permitting requirements is essential for minimizing the application processing time. Joint resolution of sensitive issues keeps all parties involved and the process on schedule. To keep applications moving and on track, the applicant is asked to provide a **Monthly Progress Report** summarizing the reports development status, including the level of completeness, key mile stones reached, and unique problems or issues encountered.

REPORT / PLAN APPROVAL: The applicant will be notified, in writing, when the final report is approved. This approval may be subject to additional conditions or stipulations essential to the mining operation or management of the mineral lease. There are unique circumstances where a lease could be approved prior to finalizing the report. However, ground-disturbing activities cannot commence until the MDR is approved.

Failure to provide sufficient, verifiable technical data, or identify and adequately address key environment issues could result in delays in approving your report or the denial of your application.

REPORT UPDATES: The MDR is considered a dynamic document, in that it can be updated or amended to reflect changing conditions or objectives associated with the mining operation. Updates or amendments may also be at the request of the Department due to additional responsibilities or regulations placed upon the Department.

It is the responsibility of the applicant or lessee to notify the Department when operations deviate from the plans approved under the MDR in accordance with the terms of the lease. Any updates or amendments must be approved by the Department.

OTHER REQUIRED REPORTS: Additional reports required by the Department after a mineral lease is approved include:

- *Monthly Production Reports*
- *Annual Operations Status Report (1 page on Department form)*
- *Reclamation and Closure Report*

DEPARTMENT CONTACT: Communications with the Department should be through the geologist assigned to your application at:

Arizona State Land Department
Minerals Section
1616 West Adams
Phoenix Arizona, 85007

Phone: (602) 542-4628

Fax: (602) 542-4668

Email: *geologist assigned to your project@lnd.state.az.us*

Mineral Development Report

Introduction

- 1 Administrative Summary**
 - 1.1 Geologic
 - 1.2 Economic
 - 1.3 Environmental Findings
 - 1.4 Operational
 - 1.5 Reclamation & Closure
- 2 General Location and Property Description**
- 3 Legal Description**
- 4 Access / Haul Roads**
- 5 Operator / Applicant Contact Information**

Part I: Technical (Baseline) Analysis

The Technical Analysis contained in Part I establishes the background and baseline technical data supporting the mineral discovery and development of your proposed mining operation. The technical analysis should be objective and based upon existing, factual, and verifiable data. If the existing data is found to be insufficient, additional studies or testing may be required. The Mine Operations Plan and Reclamation and Closure Plan covered in Part II should be founded on the technical details presented under Part I.

If a detailed project Geology, Economic, or Environmental report has been prepared separately, it can be submitted as a substitute for the applicable technical section, provided it addresses the essential topics outlined below. If a separate report is submitted, a summary of the key elements, with references to the main report should be included in the Mineral Development Report.

Discovery of a valuable mineral deposit or resource is required prior to the approval of a Mineral lease. The technical details presented under the Geologic Evaluation and the Economic Feasibility should be sufficient to demonstrate the existence of a valuable mineral deposit. For hard-rock (locatable) minerals the level of proof of discovery is based on the "Indicated" reserve classification as defined by the U.S.G.S. in Circular 831. Mineral Reserve Classification definitions for locatable minerals are included at the end of this document. Proof for common variety minerals would require demonstrating the existence of a resource that is of sufficient quantity and quality that would support the demand projected over the life of the operation.

1 Geologic Evaluation

Proposing a generic geologic outline that would apply to all potential mineral resources and their unique geologic environment would be highly impractical, if not impossible. For example, describing the unique features and characteristics of a porphyry copper or placer gold deposit

would be very different than that of a sand and gravel deposit. The following outline includes topics considered basic to most all geologic reports. However, the geologic and mineral resource details that are needed to support the proposed mining operation should follow accepted industry standards for geologic nomenclature and practices customarily used in defining or describing the commodity and deposit type under application.

1.1 Geologic Summary

1.2 Regional Geology

1.3 Exploration & Mining History

1.4 Current Project Exploration / Testing

1.4.1 Exploration Methods / Procedures

1.4.2 Analysis and Results (any hard data, points of discovery, assays, drill logs, etc.)

1.5 Detailed Property Geology

Describe those features and characteristics normally used to define the type of mineral deposit associated with your application. For example, hard-rock (locatable) deposits like porphyry copper deposits should consider mineralogy, grade, alteration, zoning, structure, etc., where common variety mineral (sand and gravel) deposits should describe the quantity and quality of the resource, the sedimentary/fluvial system, gradation, size distribution, plasticity, absorption, abrasion, etc. Placer gold deposits would require elements of both hard-rock and common variety.

1.6 Deposit Model Description

1.6.1 Depth / Top of Deposit (Ore), Dimensions, Orientation, Geometry, Distribution

1.6.2 Controls / Limitations

1.7 Mineral Resource Estimates

1.7.1 Grade / Quality (grade ranges, assumptions, projection methods, etc.)

1.7.2 Cut-Off Grade

1.7.3 Total and Recoverable Reserves (common variety mineral leases should include the minimum annual guaranteed production, and the maximum projected production in the analysis.)

1.7.4 Production Rates (estimated minimum/maximum monthly/annual rates)

2 Economic Feasibility

Value assessments require the information provided by an economic feasibility study. Value is looked at in terms of mineral resource value and value to the Trust. Mineral resource value was primarily addressed under the geologic analysis where the quality and quantity of the resource and the characteristics of the mineral deposit are discussed. Value to the Trust is basically one of revenues that the Trust realizes from the proposed mining operation. Revenues consists of both royalty and rental income. Royalty terms are different for locatable and common variety minerals. Royalties can be based on fixed rate or sliding-scale as determined by appraisal for locatable minerals, or rates set by appraisal and public auction for common variety minerals. Preliminary royalty and rent structures will be provided by the Department in the first technical conference.

- 2.1 Economic Summary
- 2.2 Commodities / Products (primary, secondary)
- 2.3 Market Analysis / Discussion
 - 2.3.1 Industry & Commodity Overview
 - 2.3.2 Commodity Value (range of market prices, point of sale)
 - 2.3.3 Supply / Demand
 - 2.3.4 Market Distance / Reach
 - 2.3.5 Competition
 - 2.3.6 Limitations and Risk
- 2.4 Costs
 - 2.4.1 Pre-mine Development
 - 2.4.2 Capital Expenditures
 - 2.4.3 Production / Operating Cost (component cost, over-head, per unit)
 - 2.4.4 Estimated Permitting
 - 2.4.5 Transportation
 - 2.4.6 Estimated Reclamation & Closure
- 2.5 Operational Economic Parameters
 - 2.5.1 Mine Life
 - 2.5.2 Investment / Discount Rate
 - 2.5.3 DCF - ROI, NPV
 - 2.5.4 Break Even Price
- 2.6 State Trust Revenue
 - 2.6.1 Royalties / Rents
 - 2.6.2 Cash Flows
 - 2.6.3 States NPV
 - 2.6.4 Other Economic Considerations

Part II: Environmental Assessment (Baseline cont.)

3 Environmental Assessment (EA)

The purpose of the EA is to assess and describe existing environmental conditions and identify and quantify environmental impacts relating to the proposed mining operation. The EA should consider drainage, erosion, safety, land use conflicts, current site conditions, regulations and permitting, and/or any other issue that could be consequential to the proposed operation. Issues and impacts identified in the EA should be addressed (mitigated) and cross-referenced in the Mine Operations Plan and/or the Reclamation and Closure Plan sections. Reclamation alternatives that consider mitigation of environmental impacts should be proposed. The preferred alternative should be noted. Mitigation measures should be discussed in the EA along with the impacts. Implementation of the mitigation measures should be detailed in the Mine Operating Plan and the Reclamation and Closure Plan sections.

3.1 Environmental Statement of Findings

3.2 Purpose and Scope of Assessment

3.3 Land Ownership (adjoining lands within no less than 1 mile)

3.4 Current / Proposed Land Uses

3.4.1 Leasing History

3.4.2 Surrounding Land Uses (minimum 1 mile radius)

3.4.3 Land Use Compatibility Issues

3.5 Geographic/Physical Setting

3.5.1 Vicinity Characteristic

3.5.2 Site Conditions (natural, disturbed, trashed, etc.)

3.5.3 Climate

3.6 Soils (describe soil types, characteristics, erosion concerns)

Note: the Department requires that top soil be removed and stockpiled to be used later in reclamation.

3.7 Drainage and Erosion:

The following technical elements are required for the assessment of impacts from mining operations within floodplains (requires technical support).

3.7.1 Hydrology: Determine design storm event(s) for analysis of impacts of in-stream mining. Obtain or develop hydrographs for single-event floods ranging from small to large frequencies. Evaluate long-term flood sequences of multiple events and flow duration data to assess worst case scenario(s) in terms of upstream and downstream impacts. Flood event(s) will be decided by ASLD and Maricopa County Flood Control Districts engineers.

3.7.2 Hydraulics: Identify main channel COE JD and floodway and floodplain fringe based upon FEMA FIRM panel maps or previous floodplain delineation studies. Where no previous floodplain study is available or, if available, is outdated,

delineate floodway and floodplain using fixed-boundary hydraulic models.

- 3.7.3 Alternative Excavation Plans: Develop alternative excavation plans including the red-line depth of allowable excavation without any short or long term impacts. Both structural and non-structural solutions to the proposed alternative plans should be considered. The feasibility of proposed plans including construction, operation and maintenance, and mitigation will be evaluated.
 - 3.7.4 Sediment Engineering: Determine sediment supply to the mined reach and compare to the planned volume of extraction. Use movable-boundary sediment continuity modeling to evaluate impacts to the channel, both vertical and horizontal, for the single and multiple flood events identified in the hydrologic analysis.
 - 3.7.5 Vertical Stability: Evaluate propagation of headcuts from upstream end of pit for the flood events identified in the hydrologic analysis. Assess both short-term and long-term time frames using appropriate procedures.
 - 3.7.6 Lateral Stability: Evaluate lateral migration hazards based on hydraulic, sediment transport, and geomorphologic assessment.
 - 3.7.7 Hazards to Structures: Based upon findings of the vertical and lateral stability analyses, assess hazards to structures located in the floodway and/or floodplain.
 - 3.7.8 Drainage Mitigation Measures: Design structures to mitigate and/or prevent lateral erosion and scour due to in-stream mining.
- 3.8 Surface/Ground Water
- 3.8.1 Surface Water (springs, ponds, etc.)
 - 3.8.2 Ground Water Hydrology (well data, depth of well and top of water, flow direction, water basin, active manage area, etc.)
 - 3.8.3 Ground / Surface Water Contamination / Run Off (current quality)
 - 3.8.4 Operational impacts on surface and subsurface water
 - 3.8.5 Operational water requirements (usage, sources, permit requirements)
- 3.9 Biology (short / long term impact, existing habit and habitat loss)
- 3.9.1 Native / Protected Plants
 - 3.9.2 Introduction and Control of Noxious Plants
 - 3.9.3 Wildlife
 - 3.9.4 Threatened and Endangered Species
- 3.10 Cultural Resources (Archaeology)
- 3.11 Hazardous Materials (use, types, quantities, treatment, storage)
- 3.11.1 Waste
 - 3.11.2 Chemicals
 - 3.11.3 Explosives

- 3.12 Solid Waste
- 3.13 Septic
- 3.14 Air Quality (current standards)
- 3.15 Noise (sources, levels, duration, standards)
- 3.16 Visual Impacts
- 3.17 Open Space, Parks, Recreation Areas, Wildlife Refuges
- 3.18 Environmental Liens

3.19 Regulations and Permits

Determine what permits are required and indicate their status, expected date for obtainment, special permitting issues: copies of permits and correspondence relating to permits should be included as an appendix.

Documentation, indicating the permitting requirements, should be obtained from the responsible agency and made part of this report.

Other permits that relate to or are required by your proposed operation should be added.

- 3.19.1 Corps of Engineers Section 404/401 Permit
- 3.19.2 County Flood Control Permit / Floodplain Use Permit
- 3.19.3 Special Use permits (local jurisdictions)
- 3.19.4 National Pollutant Discharge Elimination System Permit
- 3.19.5 Air Quality Permit
- 3.19.6 Aquifer Protection Permit
- 3.19.7 Notice of Intent to Drill
- 3.19.8 Septic Tank
- 3.19.9 Hazardous Waste Permit
- 3.19.10 Waste Water Reuse
- 3.19.11 Storm Water Discharge

3.20 Utilities

Discuss existing utility infrastructure including locations & capacity for each utility, and if required, how they will be provided/delivered if nonexistent.

- 3.20.1 Water
- 3.20.2 Gas
- 3.20.3 Electric
- 3.20.4 Sewer

3.21 Improvements

All improvements related to mining operations are to be removed at the end of mining.

- 3.21.1 Existing
- 3.21.2 Planned

3.22 Transportation

- 3.22.1 Infrastructure (current, planned)

Documentation Guidelines and Requirements for Mineral Operations On State Trust Lands

- 3.22.2 Local Traffic Conditions
- 3.22.3 Operational Requirements (loads per day, size, distances, routing, timing etc.)
- 3.22.4 Transportation Issues (residential areas, dirt roads)

- 3.23 Planning and Zoning (current zoning, rezoning, exemptions for Mining/Metallurgical use)
 - 3.23.1 Current Planning and Zoning (County/City General Plan)
 - 3.23.2 Conformance to Zoning Requirements or Master Plan

- 3.24 Socio-Economic Impacts
 - 3.24.1 County and Community Economic Impacts (employment, payroll, taxes, etc.)
 - 3.24.2 Benefits and Improvements (open space, channelization, flood control, retention, commercial, etc.)
 - 3.24.3 Emergency Response (procedures, notification, timing)

Part III: Operations and Planning

It is especially important that environmental issues and impacts identified in the Environmental Analysis be addressed in the Mine Operations or the Reclamation and Closure section of the MDR. You are encouraged to contact the Department's Minerals Section to discuss or clarify Mine Operating Plan requirements and expectations.

After the issuance of a mineral lease, the lessee will be required to submit an *Annual Operations Status Report* on the 30th of January of each year that the lease is in effect. The status report will include: tons mined, total commodity recovered, total acres disturbed and total acres reclaimed along with maps and/or aerial photos showing these areas.

4 **Mine Operations Plan (MOP)** The purpose of the Mine Operations section is to provide detailed technical and operational information. Primary topics cover mining operations, equipment, processing facilities, materials handling, security, and production schedules. The MOP should discuss the issues identified in the EA that can be handled at the mine operations level. The MOP should also be tightly integrated with the Reclamation and Closure Plan to reflect concurrent, on-going reclamation.

4.1 Operations Summary

4.2 Development / Production Schedules

(i.e. projected mine life, operating days per year, production rates)

4.3 Site Development (clearing, infrastructure, topsoil removal and stockpiling, etc.)

4.4 Access and Haul Roads

4.5 Construction

4.6 Mining

4.6.1 Mine Method (open pit, quarry, underground, sluicing, dry washing, etc.)

4.6.2 Mine Design Parameters

(i.e. waste ratios, dilution, recovery, heights, slopes, mining days per year, hours, haul road widths)

4.6.3 Topsoil Removal and Stockpiling

4.6.4 Slope / Bench Preparation

4.6.5 Drilling and Blasting

4.6.6 Loading, Hauling and Conveying

4.6.7 Stockpiles

4.6.8 Loading / Hauling

4.6.9 Mining Equipment and Facilities (type, size and capacity of all equipment)

4.6.10 Ancillary Equipment and Facilities (maintenance areas, mine office, etc.)

4.7 Processing/Recovery (include flow chart)

4.7.1 Plant Operations and Design (concentrating, crushing, screening, sorting, etc.)

4.7.2. Process Equipment (w/specifications)

4.7.3 Ancillary Processing Equipment and Facilities

4.7.4 Product Mix

4.7.5 Ore / Materials Handling (i.e. crushing, conveying, screening, sorting/classifying)

- 4.8 Production Monitoring and Verification
- 4.9 Product Handling, Stockpiling, Bagging, Storage
- 4.10 Product Transportation/Hauling
- 4.11 Labor Force
- 4.12 Contractors / Subcontractors (construction and mining)
- 4.13 Dust Control and Other Particulates
- 4.14 Noise Abatement
- 4.15 Blasting, Explosives Storage and Handling
- 4.16 Power Generation and Distribution
- 4.17 Water Supply, Storage and Use (recycling, filtering, sedimentation)
- 4.18 Fuel Storage
- 4.19 Sanitary and Solid Waste Handling and Disposal
- 4.20 Hazardous Waste Handling / Water Pollutants / Spills (surface, subsurface)
- 4.21 Site Security
- 4.22 Fire Protection
- 4.23 Cultural Resources
- 4.24 Protected Plant Species Handling
- 4.25 Wildlife / Endangered Species Protection
- 4.26 Visual Impact
- 4.27 Emergency Response (notification, monitoring and reporting)

- 5 **Reclamation and Closure Plan (RCP)** The Reclamation and Closure Plan will address the technical and operational details relating to the preferred reclamation alternative outlined in the EA section of the MDR. The goal is to reclaim all disturbed areas to a physically and chemically safe and stable condition, that allows the highest, sustainable post-mine use. This plan should be tightly integrated with the Mine Operating Plan to reflect concurrent, on going reclamation where feasible, in a manner that will accomplish the desired reclamation goal. The RCP scope naturally depends on the type and size of the mining operation. It is recognized that over time reclamation requirements, technology or methods may change. The *Reclamation and Closure Report* discussed below will take these changes into account at the close of mining.

A **reclamation bond and indemnity insurance** will be required as a guarantee of compliance with all lease conditions and requirements.

5.1 Reclamation Alternatives

Reclamation must consider the best, most reasonable post-mining uses. Alternatives should be proposed that will accomplish that level of reclamation. The preferred alternative should be detailed below.

- 5.1.1 Alternative A: Preferred Alternative
- 5.1.2 Alternative B
- 5.1.3 Alternative C

5.2 Reclamation Approach / Methods (special technology required or applied)

- 5.2.1 Proposed Areas of Disturbance (mining, trenches, pits, processing sites, storage sites, stockpiles, etc.)

- 5.2.2 Equipment and Structure Removal
 - 5.2.3 Waste Dumps, Stockpiles, Tailings
 - 5.2.4 Settling / Filtration Ponds
 - 5.2.5 Roads, Power lines, Water lines, Fences
 - 5.2.6 Post Mining Site Preparation (i.e. topsoil replacement, grading, re-contouring, etc.)
 - 5.2.7 Re-vegetation / Seeding
 - 5.2.8 Slope Stabilization
 - 5.2.9 Erosion and Drainage Control
- 5.3 Reclamation Scheduling and Timing
 - 5.4 Personnel (short and long-term)
 - 5.5 Post-Mine Care (long-term commitments, maintenance, and monitoring)
 - 5.6 Reclamation Projected Costs (short and long-term)
- 5.7 Approach to Developing the *Reclamation and Closure Report*

The Reclamation and Closure Report is a separate report due 30 days after the completion of final reclamation. The closure report documents all past and final reclamation efforts. Final reclamation requirements and procedures will be coordinated with the Department along with long-term commitments, maintenance, and monitoring. Discussion of any unique reclamation issues related to the mine closure should be included. Operations requiring long-term monitoring will require quarterly status reports. Preparation for the closure report should coincide with the first phase of mining. The closure should document all concurrent and final reclamation, including responses to emergency situations, mitigation measures taken that address environmental impacts and safety hazards. The report represents a time-line of reclamation efforts. Post-mining and final reclamation aerial photos will be required.
- 5.8 Reclamation Summary

Suggested Appendices & Illustrations

Suggested Appendices

Geologic test results, sample analysis w/ description, location, and testing method, drill logs, reserve calculation worksheets, cash flow or other economic data or calculations, etc.
Phase I Environmental Study
ASLD Environmental Questionnaire & responses
Copies of Permits or Correspondence relating to permitting
Correspondence
References
Agencies, Consultants & Individuals Contacted

Suggested Illustrations/Plates/Maps: Introduction. Geologic & Environmental

General Location Map
Detail Location Map (showing relationships of)
 Lease / Operations Boundaries
 Ownership (Surface & Mineral, at least 1 mile surrounding operation)
 Access routes and haul roads
 Existing Right of Ways / Roads / Highways
 Utilities
 Municipal Boundaries
 Parks, Preserves, API Boundaries
 Floodplain / Floodway and COE Jurisdictional Boundaries
 Areas of disturbance (reference details in MOP)
 Drainage (Surface & Groundwater Flow maps)

Geologic Maps (surface geology, mineralization/alteration/zoning, structure, deposit boundaries, etc.)
Cross-sections
Sample/test sites, drill hole locations
Aerial Photo (Recent and historic aerial photos - w/lease boundaries)
Oblique aerial photos
Digital Photos (digital form w/hard copy print)
Contour map (2 foot interval)
Surface Photos (digital form and print)
Other illustrations necessary to represent current conditions and describe the deposit

Suggested Illustrations/Plates/Maps: Operations & Reclamations

Plant/Facilities/Dumps/Stockpiles layout
Mining plans (scheduled, phased)
Process flow chart
Pre/Post contour maps
Aerial Photos (post mining and reclamation aerial photos will be required)
Pre/Post profiles (cross sections)
Reclamation Concept renderings
Maps showing facilities, roads, fences & other features to be removed
Other illustrations necessary to depict mine operations and reclamation

Definitions

Reserve Classification: U.S. Geological Survey Circular 831

- Measured:** Quantity is computed from dimensions revealed in outcrops, trenches, workings, or drill holes; grade and/or quality are computed from the results of detailed sampling.. The sites for inspection, sampling, and measurement are spaced so closely and the geologic character is so well defined that size, shape, depth, and mineral content of the resource are well established.
- Indicated:** Quantity and grade and/or quality are computed from information similar to that used for measured resources, but the sites for inspection, sampling, and measurement are farther apart or are otherwise less adequately spaced. The degree of assurance, although lower than that for measured resources, is high enough to assume continuity between points of observation.
- Inferred:** Estimates are based on an assumed continuity beyond measured and/or indicated resources, for which there is geologic evidence. Inferred resources may or may not be supported by samples or measurements.

Document Presentation Requirements

(Prepared for State Land Department)

Copies: Two (2) hard copies labeled: Copy 1 of 2 and 2 of 2
Digital Copy: Report text and digital images, maps, etc. should be submitted in digital form on CD or Zip disk.

Binding: Loose leaf, 3 ring, 8 1/2" X 11"

Binder Cover and Report Title Page (sample attached)

Report Title
Lease / Application Number
Lease / Application Type (Mineral Lease, Mineral Materials Lease/Sales Agreement)
Location: Township, Range, Section and County
Name of Lessee / Applicant
Address, Phone
Prepared By Section
Prepared For Section
Date

Binder Spine Identification (sample attached: position to read from top - down)

Report Title
Name of Lessee / Applicant
Lease / Application Number and Type
County, State - Township, Range, Section

Table of Contents

Adhere to the prescribed outline. If required, additional sections can be added.

Appendices w/Labeled tabs

Margins: right 1 inch, left 1 inch

Font: Arial or times roman, 12 point

Justification: Left or Full

Page Header: Include report Title & Application/Lease I.D.# (Start header after title page)

Page Footer: Page number, right justified, form Page *x of x*. (Start page numbering after title page)

(Sample Cover & Title Page Format)

MINERAL DEVELOPMENT REPORT

Application 04-999999

**Section 32, T15S, R14E
Pima County, Arizona**

XYZ Mining, Inc.

9999 South Rocky Road
Phoenix, Arizona 85007
(602) 999-9999

S a m p l e

Prepared By

ABC Consulting Services
P.O. Box 999
Phoenix, Arizona 85007
(602) 999-9999

For

Minerals Section
Natural Resource Division

Arizona State Land Department

January 01, 2004

(Sample Spine Label Format)

MINERAL DEVELOPMENT REPORT

**XYZ Mining, Inc.
Mineral Materials (04-999999)
Pima County, Arizona - Section 32, T15S, R14E**