NDEP Mining Regulation and Reclamation

Mining Oversight and Accountability Commission

January 25, 2022

Presented by:
Greg Lovato, Administrator, NDEP

ndep.nv.gov/land/mining | @NevDCNR
To preserve and enhance the environment of the State in order to protect public health, sustain healthy ecosystems, and contribute to a vibrant economy.
Nevada Division of Environmental Protection

Organizational Structure

- Administrator
  - Deputy Administrator
    - Bureau of Industrial Site Cleanup
    - Bureau of Sustainable Materials Management
    - Bureau of Air Quality Planning
    - Bureau of Corrective Actions
    - Bureau of Air Pollution Control
  - Deputy Administrator
    - Bureau of Administrative Services
    - Bureau of Water Quality Planning
    - Bureau of Water Pollution Control
    - Bureau of Safe Drinking Water
  - Deputy Administrator
    - Bureau of Mining Regulation and Reclamation
  - Bureau of Federal Facilities

10 Environmental Bureaus
1 Administrative Bureau
**BUREAU OF MINING REGULATION AND RECLAMATION**

**The Basics:**

- Created in 1989
- Entirely Funded by Mining Permit Fees
- Cradle-to-Grave Program

**Three Specialized Branches:**

- Regulation – Ensures Protection of Waters of the State
- Reclamation – Ensures Mines are Reclaimed to a Productive Post-Mining Land Use
- Closure – Ensures Mines are Chemically Stabilized
PERMITS REQUIRED

Multiple Federal, State, and Local Permits are Required in Nevada before Mining or Milling Can Begin

STATE REQUIREMENTS

COMMISSION ON MINERAL RESOURCES, DIVISION OF MINERALS

MINE REGISTRY FORMS
Agency to contact: Nevada Division of Mines (http://minerals.nv.gov)
Carson City Office: 400 W. King St., Suite 106, Carson City, NV 89703
Phone: (775) 684-7040, Fax: (775) 684-7052
Las Vegas Office: 2030 E. Flamingo Rd., Suite 220, Las Vegas, NV 89119
Phone: (702) 486-4343, Fax: (702) 486-4345

When Required: Within 30 days after a mine operation begins
Required Action: Operators shall submit a completed form for registration
Legal Authority: NRS 513.063 and 513.073
Administrative Authority: NAC 513.120

ANNUAL STATUS AND PRODUCTION REPORT
Agency to contact: Nevada Division of Mines (http://minerals.nv.gov)
Carson City Office: 400 W. King St., Suite 106, Carson City, NV 89703
Phone: (775) 684-7040, Fax: (775) 684-7052
Las Vegas Office: 2030 E. Flamingo Rd., Suite 220, Las Vegas, NV 89119
Phone: (702) 486-4343, Fax: (702) 486-4345

When Required: On or before April 15 of each year
Required Action: Operators shall submit a report relating to the annual status and production of the mine for the preceding calendar year.
Legal Authority: NRS 513.063 and 513.073
Administrative Authority: NAC 513.120

FEES FOR ABATEMENT OF HAZARDOUS CONDITIONS AT ABANDONED MINES
Agency to contact: Nevada Division of Mines (http://minerals.nv.gov)
Carson City Office: 400 W. King St., Suite 106, Carson City, NV 89703
Phone: (775) 684-7040, Fax: (775) 684-7052

When Required: Within 30 days after approval of a Federal plan of operation or amended plan of operation
Required Action: Operator to provide Division of Mines copy of filing of plan of operation or amended plan of operation; fee; refund; use of money collected; Division to file report with Governor and Legislature.
BMRR Permitted Facilities and Exploration Projects

267 Reclamation Permits
173 Water Pollution Control Permits
98 Operating Mines
17 Mines in Temporary Closure
31 Mines in Permanent Closure
27 Mining Projects Not Yet Built

Interactive Online Map
http://webgis.ndep.nv.gov/

Reclamation Permits
- Mining: 153 (57%)
- Exploration: 114 (43%)

Water Pollution Control Permits
- Operating: 98 (57%)
- Closed: 31 (18%)
- Temp Closure: 17 (9%)
- Not Yet Built: 27 (16%)
NDEP Mining Program

Pre-Regulation (before 1989) vs. Post Regulation (1990 onward)

3 part NDCNR blog series from February 2021


Part 2 - It’s Our Duty to Protect Nevada’s Water. So How Do We Protect Nevada’s Water’s at Modern Mines?

Part 3 - Pit Lakes are Tricky to Manage: 4 Tools We Use to Preserve Water Quality

Administer Water Pollution Control Law and Mining Regulations through issuance of Water Pollution Control Permits

Any Mining or Processing Activity that has Potential to Degrade Waters of the State

Public and Private Lands

Industrial Minerals (Sand, Gravel, Clay, Slate, Gypsum) Exempt

Govern Site Characterization, Facility Design, Construction, and Operation
The Proposed Mine Site Must be Characterized Prior to Permitting

“Assessment of Area of Review”

- Hydrogeological and Lithological Conditions
- Surface Waters & Meteorological Report
- Representative Samples of Overburden, Ore, and Waste Evaluated for Potential to Generate Acid and Mobilize Contaminants
- Geologic and Hydrologic Studies Predict Groundwater Impacts

Site Characterization and Predictive Studies Direct Facility Design and Closure Plans
REGULATION BRANCH

SITE CHARACTERIZATION – PIT LAKES

Operation
Dry Pit

Precipitation

Infiltration
Pit Wall Runoff

Treatment (as required)
Discharge

Infiltration

Exposed Sulphide

O₂

O₂

Historic Mine Tunnel

Groundwater

Flow

Infiltration

Post-Closure
Pit Lake

Precipitation

Evaporation
Atmosphere-Lake Interaction

Lake Circulation
Mineral Precipitation/Sorption

Surface Water Diversion / Catchment Runoff

Pit Wall Runoff

Damaged Rock Zone (DRZ)

Waste Backfill (Potential Source of ARD, NMD or SD)

Historic Mine Tunnel

Groundwater Flow
Process Fluid Containment
  Zero Discharge Requirement for all Process Fluids During Operations

Minimum Design Requirements
  Liners
  Leach Pads
  Ponds
  Vats, Tanks, etc.
  Tailings Impoundments
  Stormwater Controls
  Secondary Containment
  Leak Detection

Designed by Licensed Professional Engineer
Approved Prior to Construction
Quality Control and Quality Assurance
Verify Built to Approved Design
Facility Monitoring and Reporting
Quarterly Inspections
Enforcement for Noncompliance
REGULATION HAS REDUCED WATER QUALITY DEGRADATION AT OPERATING NV MINES

- **All Operating**
  - Total: 97
  - No Degradation: 86
  - With Degradation: 11

- **Post-Reg**
  - Total: 78
  - No Degradation: 76
  - With Degradation: 2

- **Pre-Reg**
  - Total: 19
  - No Degradation: 10
  - With Degradation: 9

Legend:
- Total
- No Degradation
- With Degradation
REGULATION HAS REDUCED WATER QUALITY DEGRADATION AT NV MINES

- Total: 29
- Pre-Regulation: 25
- Post Regulation: 4

Closed, Temp
Closed, and Operating
Mines with Degradation
REGULATION HAS REDUCED WATER QUALITY DEGRADATION AT NV MINES

20 from Heap Leach Pad, Tailings Storage and Pond Leaks
2 Pit Lake Quality

Closed, Temp
Closed, and Operating Mines with Degradation

1 from Tailings Storage Leak
2 Pit Lake Quality

17
Administer Reclamation Law and Regulations Through Issuance of Reclamation Permits and Establishment of Financial Surety

Mining Operations and Exploration Projects are Reclaimed Safe and Stable
Provide for a Productive Post-Mining Land Use

Acceptable Post-Mining Land Uses

- Wildlife Habitat
- Cattle Grazing
- Recreation
- Industrial Site/Business Park
- Future Mineral Exploration and Development
- Renewable Energy Creation and Storage
Standardized Reclamation Cost Estimator (SRCE)

$ Third-party Costs
Cost Data File Annual Update

Surface Reclamation (Regrading Stabilization, Vegetation)
Waste Rock Dumps
Heap Leach Pads
Roads
Tailings
Pits and Underground Openings

Process Fluid Stabilization
Heap Leach Pads
Tailings Impoundments
Mine-Impacted Waters
## Reclamation Branch

### Nevada Financial Assurance (Millions of Dollars)

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COORDINATION WITH FEDERAL LAND MANAGERS

Memorandum of Understanding with BLM and USFS

Collaboration is Key
Share Information
Coordinate Concurrent Agency Review
Copy Agencies on Decisions
Send Updates

Approval from all Agencies Required
Challenges for Final Closure

- Long-term active and/or passive treatment
- Process solution draindown/disposal
- Pit lake water quality
- Acid rock drainage
- Groundwater contamination
- Long-term funding mechanisms if necessary

Increased Focus on Up-Front Closure Planning

Conceptual closure plan must support the initial reclamation plan/cost estimate
**Preferred Closure Practices**

1. Inhibit migration of precipitation through closed components
2. Install engineered soil and/or synthetic covers
3. Passively capture draindown over the long term (Evaporation cells)
4. Zero discharge condition for the long term
CLOSURE BRANCH

SITE CLOSURE MONITORING

Progress Toward Physical and Chemical Stability

- Regular Site Inspections
- Quarterly Monitoring and Reporting
- Monitoring Wells
- Draindown

Annual summary
- Revision to Final Closure Plan if Necessary
Increased Focus on Up-Front Closure Planning
  Conceptual closure plan must support the reclamation plan/cost estimate

Initial Site Characterization

Heap Leach Facility Draindown and Cover Performance

Long-term Trusts for Mine-Impacted Water

Improved Access to Information

Scientific Advancements
  Drone sampling, isotope analysis, evaporative mineral precipitates, collaboration, predictive modeling
Questions?

Nevada Division of Environmental Protection:
http://ndep.nv.gov
Bureau of Mining Regulation and Reclamation:
http://ndep.nv.gov/land/mining

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