

Hurdles to Mining Abandoned Mine Lands

Nacimiento Copper Mine - An Example

“Making Abandoned Mine Lands Profitable” Workshop Presentation

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Principal

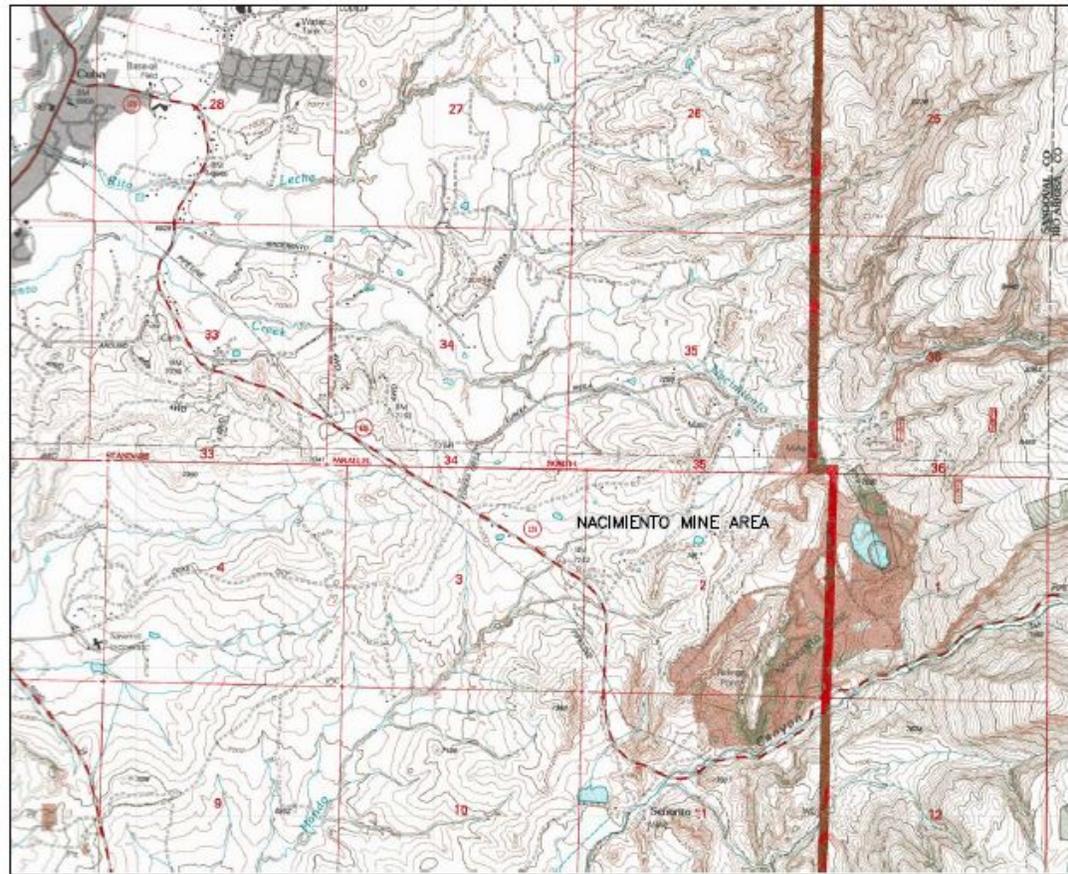
Toltec Mesa Resources LLC

March 27-28, 2018



Introduction

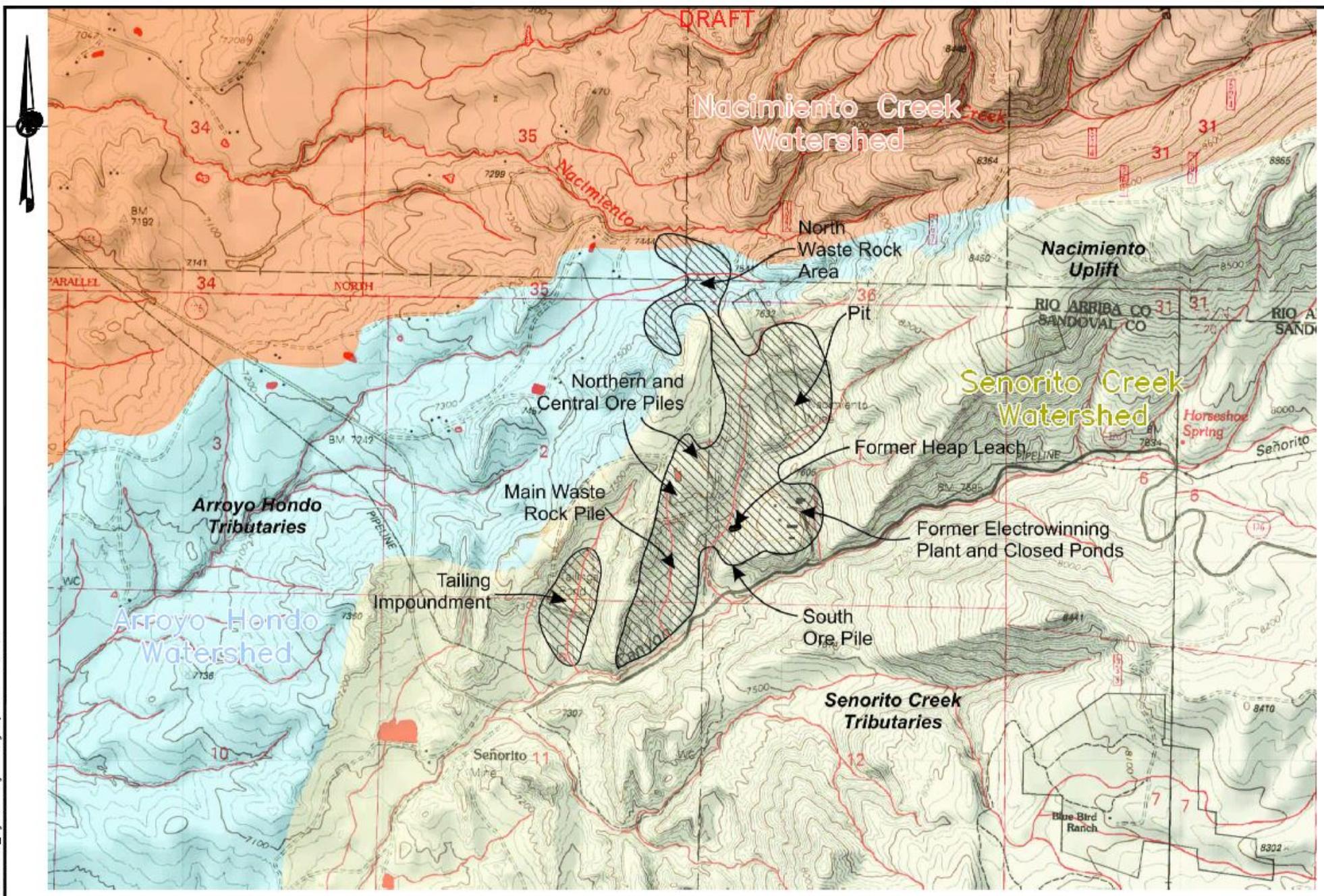
- ▶ Overview of Nacimientos Copper Mine
- ▶ Mine History/Known Environmental Liabilities
- ▶ Opportunities with Redevelopment
- ▶ Hurdles to Clear with Redevelopment



3000 0 3000
SCALE 1"=3000' FEET

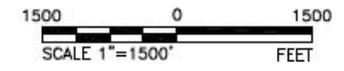


NOT TO SCALE



DRAFT

 MINE FACILITIES AND DISTURBED AREAS





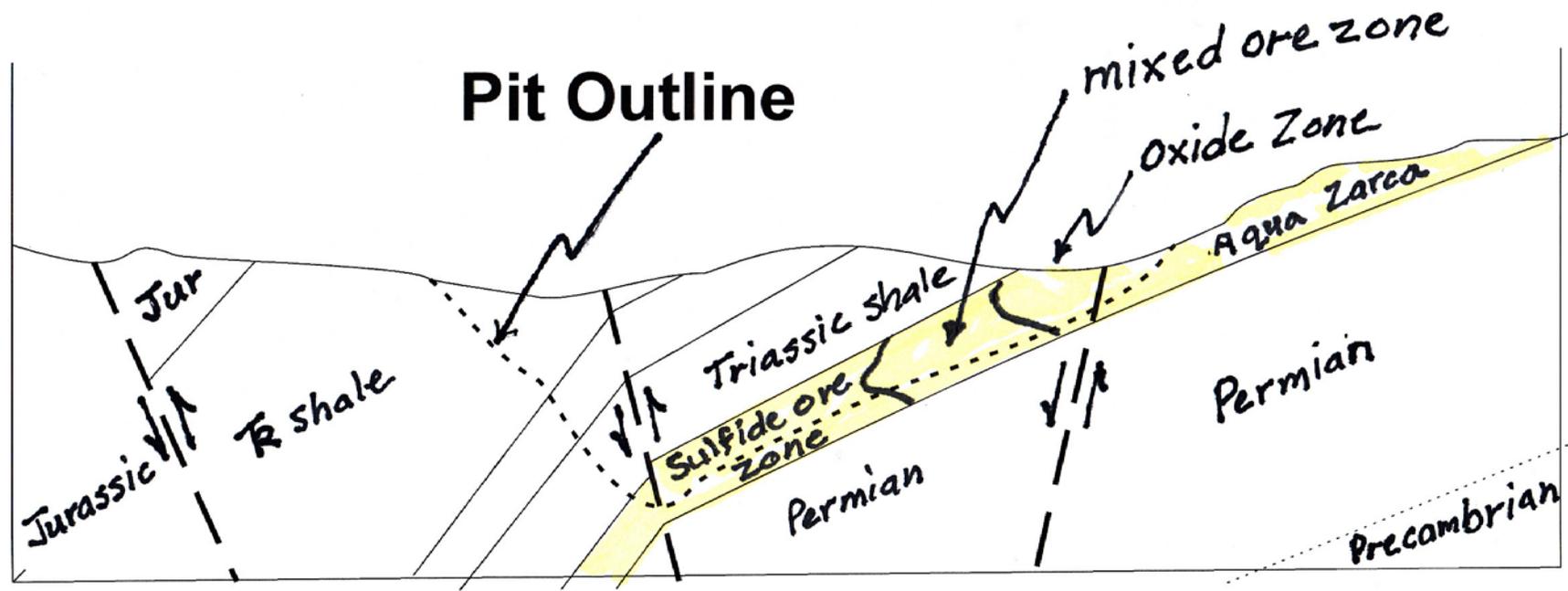
Nacimientto Mine Mineralization

- ▶ “Red Bed Copper Deposit” in Triassic Aqua Zarca Sandstone (Chinle Group)
- ▶ Mineralization is Stratabound in Faulted & Steeply Dipping Sedimentary Rocks Adjacent to Nacimientto Uplift
- ▶ Estimates of between 128 to 192 million lbs of Cu as In-Place Reserves; Average Cu Grade is about 0.7% Cu
- ▶ Cu Mineralization Dominantly Chalcocite (Copper Sulfide) replacing Carbonaceous Material in Permeable Fluvial Channel Deposits
- ▶ Oxidation & Enrichment - Secondary Copper Oxides, Carbonates & Silicates Above the Sulfide Cu Ore
- ▶ Low Pyrite Concentrations (Not Acid Generating)

W

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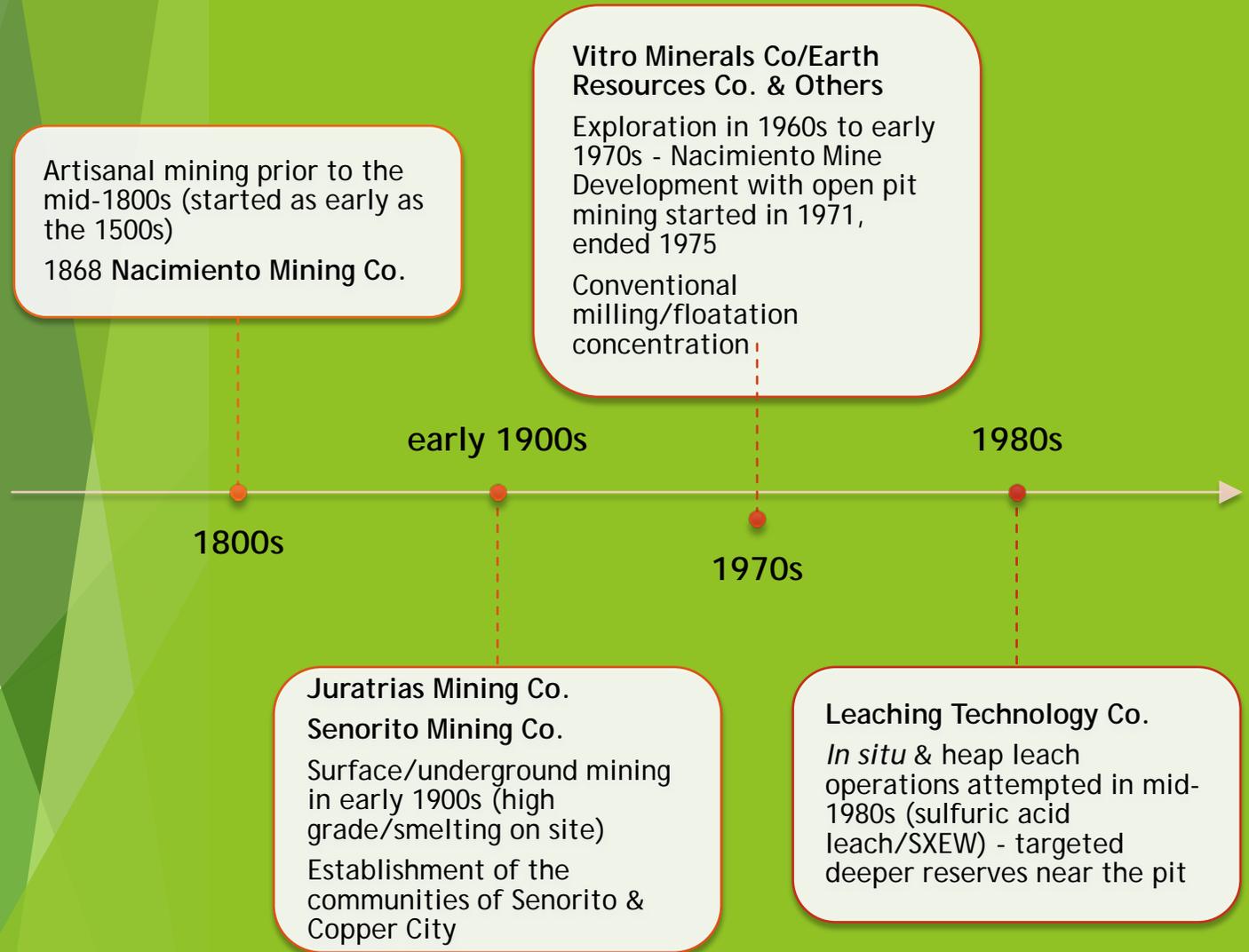
Pit Outline



0 1000 feet

SCALE

Mining History



Nacimiento Mine - early 1980s

East View of Mine Area



South View of Mine Area





Mine Features at Site Now

- ▶ Tailing impoundment
- ▶ Overburden & waste rock piles
- ▶ Low grade ore piles and former test leach/solution management areas
- ▶ Open pit and mineralized high wall
- ▶ Former mill & concentrator area (structures removed)
- ▶ *In situ* leach well field, storage and conveyances facilities
- ▶ Water treatment/discharge facilities (USDA Forest Service)
- ▶ Former smelter areas (at least 2)





Land Ownership

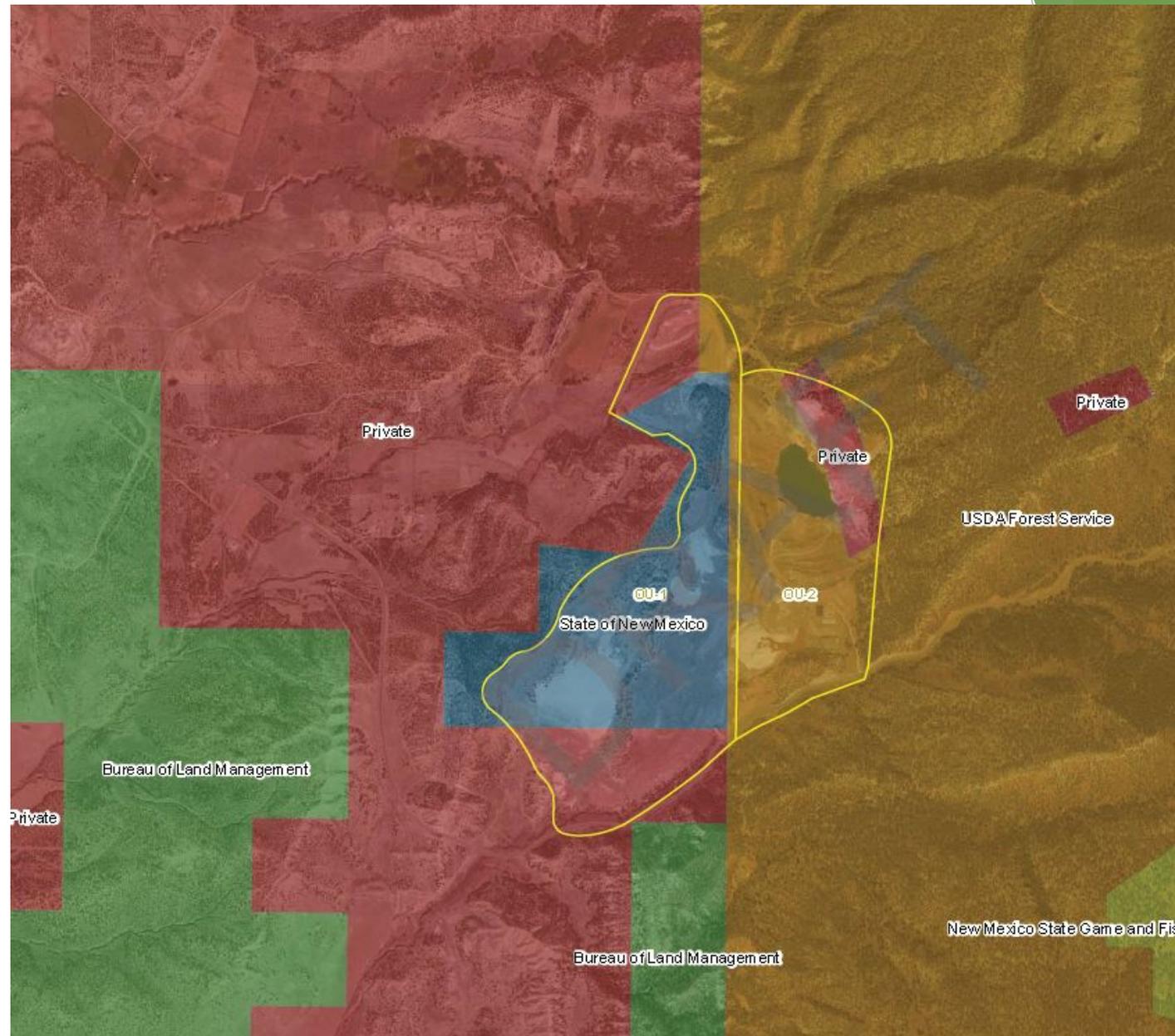
Federal

USDA Forest Service

DOI Bureau of Land Management

State

Private



Legend

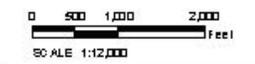
- Operating Units 1 and 2

Land Ownership

- Bureau of Land Management
- New Mexico State Game and Fish
- Private
- State of New Mexico
- USDA Forest Service

REFERENCES AND NOTES

1. Projection: NAD 1983 NAD83 StatePlane New Mexico Central FIPS 5002 FUS
2. State and Federal Data: U.S. Bureau of Land Management - New Mexico and Colorado State Office, 2008



OU-1 NACIMIENTO TAILING WIPONDMENT
STAGE 2 ABATEMENT PLAN

NACIMIENTO COPPER MINE
LAND OWNERSHIP



Environmental Concerns

- ▶ Runoff and Erosion from the Various Piles at the Site
- ▶ Contaminated Ground Water from *In Situ* Leaching Effort
- ▶ Contaminated Ground Water from Tailing Seepage
- ▶ Tailing Spill to Senorito Creek - Dam Failure 1970s
- ▶ Long-Term Pit Lake Water Quality
- ▶ Soil Contamination from Former Smelting/Other Sites



Regulatory History

- ▶ NMOSE - tailing impoundment regulated as dam; permitted (early 1970s) & closed (early 1980s)
- ▶ State Land Office - Lease Inspections (1975 - 1986)
- ▶ NMED (WQA/WQCC compliance)
 - ▶ 1984 Discharge Permit issued to Leaching Technology Inc. (exp. 1992)
- ▶ NMED Superfund Oversight - Site-Wide CERCLA investigations & Risk-Based Assessments (1987, 1989 & 1994)
- ▶ EMNRD MMD - NM Mining Act/Rules mining permit application (1994) to LTI; denied (1996)



Regulatory History Cont'd

- ▶ USDA Forest Service - (CERCLA) RP search, emergency response actions, RI/FS, PA/SI, ROD, RDA, implementation (1996 - present) [limited to Forest Service lands]
- ▶ Part of a Puerco Basin (CWA/NMED Surface Water) - watershed impacts assessment (1998)
- ▶ NMED (WQA/WQCC) - Compliance Assessments (2005 - 2007) [focused on non-Forest Service lands]
- ▶ NMED (WQA/WQCC) - Stage 1 & Stage 2 Abatement Efforts - Tailing Impoundment Area (2008 to present)
- ▶ USDA Forest Service - (CERCLA) PA/SI, EECA & AOC for closure & reclamation of South Ore Pile/Heap Leach Pile



Resource Development Opportunities & Benefits

- ▶ Mine Redevelopment with Financial Assurance & Closure Plans
- ▶ Operate under the Current Regulatory Environment
- ▶ Closure/Reclamation with “Best” Practices
- ▶ Financial Assurance Necessary to Close/Reclaim in Forfeiture Scenario
- ▶ Value of Mining and Recovery of Remaining Ore
- ▶ Reprocessing of Tailing & Low-Grade Ore Piles to Recover Metals



Other Benefits to Redevelopment

- ▶ Economic Benefits (Employment/Taxes)
- ▶ Establish a Community-Beneficial Post-Mining Land Use
- ▶ Restoration to a Post-Mining “Sustainable Ecosystem”
- ▶ Legacy Management of any Long-Term Liabilities



Initial Hurdles – Biggest Challenges

- ▶ Reducing Operator Liability
- ▶ Obtaining a “Liability Shield” from Historic Environmental Impacts
- ▶ Navigating the Complex Legal & Legislative Issues
- ▶ Current Situation:
 - ▶ Remining/Redevelopment of AMLs for Economic Benefit has been Discouraged
 - ▶ Reprocessing of Wastes Requires the “Generated Revenue” Solely Fund Remediation (No Profit)
 - ▶ Discourages Mining Industry Involvement (Primary Source of Expertise & Funding for a project of this scale or larger)



Hurdles to Redevelopment

- ▶ Typical Long Lead Time (decade or more)
- ▶ Risk of A Decreasing Commodity Price
- ▶ Negotiating Site Access, Property and Mineral Rights
- ▶ Verification of the Resource Size & Character for Metal Recovery
- ▶ Feasibility Studies to Support Financial Investment
- ▶ Mine/Reclamation Plant for New Mexico Mining Act Compliance
- ▶ Baseline Studies Necessary for Permitting/Impact Assessment



Other Potential Process Hurdles

- ▶ Mitigation of Environmental & Cultural Resources Impacts (NEPA/NHPA/NMMA)
- ▶ Assessment of Water Supply Needs/Feasibility & Obtaining Water Rights for Operations (NMOSE)
- ▶ Negotiations of Necessary Financial Assurance



Obtaining Operating Permits

- ▶ Applications for Operating Permits
 - ▶ Groundwater Quality Protection - NM WQA/WQCC Discharge Permit(s)/Closure Plans/Financial Assurance
 - ▶ Surface Water (Stormwater) Quality Protection - CWA/Multi-Sector General Permits
 - ▶ Surface Water Point Discharge(s) - CWA/NPDES Permit(s)
 - ▶ Air Quality Permits - NM AQA



Last Leg - Operations

- ▶ Power & Transmission - Feasibility (Availability, Alternatives & Costs)
- ▶ Road Improvements (NMDOT)
- ▶ Availability of Workforce (Experience/Trained)
- ▶ Housing and Support Services for Construction & Mine Workforce



Overarching Hurdle – Obtaining Social License

- ▶ Achieving a Level of Acceptance or Approval by Local Communities & Stakeholders
- ▶ Management of Involvement & Input from Stakeholders & Regulators



Questions?