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Energy, Minerals and Natural Resources Department Mining Act Public Meeting - Tyrone Mine Closeout Plan

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Today's Presentation and Tyrone Panel

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Little Rock Mine – Permit GR010RE Revision 20-1 (Mandy Lilla)

- Life of Mine and Mine Plan Update
- Routine Update to Reclamation Plan (Closeout Plan)
- Changes to Financial Assurance

Related Studies and Response to Comments

- Water Issues – (Lee Nix, John Ayarbe – Daniel B Stephens and Associates)
- Overview of Assessment of Community and Environmental Impacts - wildlife, noise, blasting, light, etc. – (Tom Shelley)
- If questions on specifics – other panel members are: Walt Niccoli – Telesto, Tom Meuzelaar and Morgan Warren – Life Cycle Geo, Adam Offutt, Dal Moellenberg - Ghallager and Kennedy

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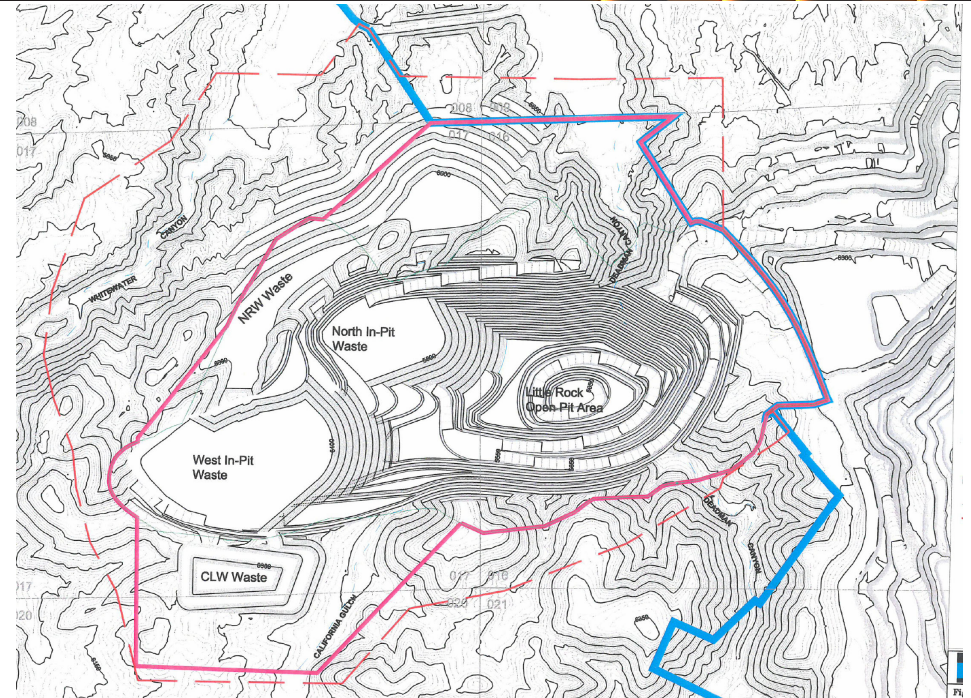
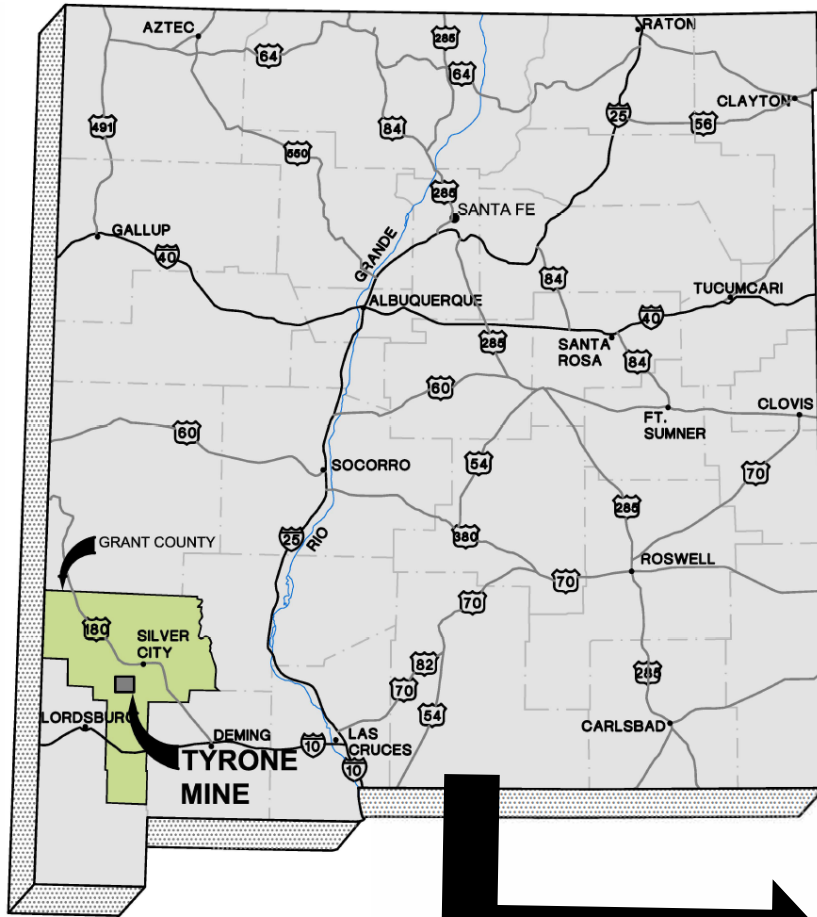
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Expansion

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Tyrone Mine Location Map

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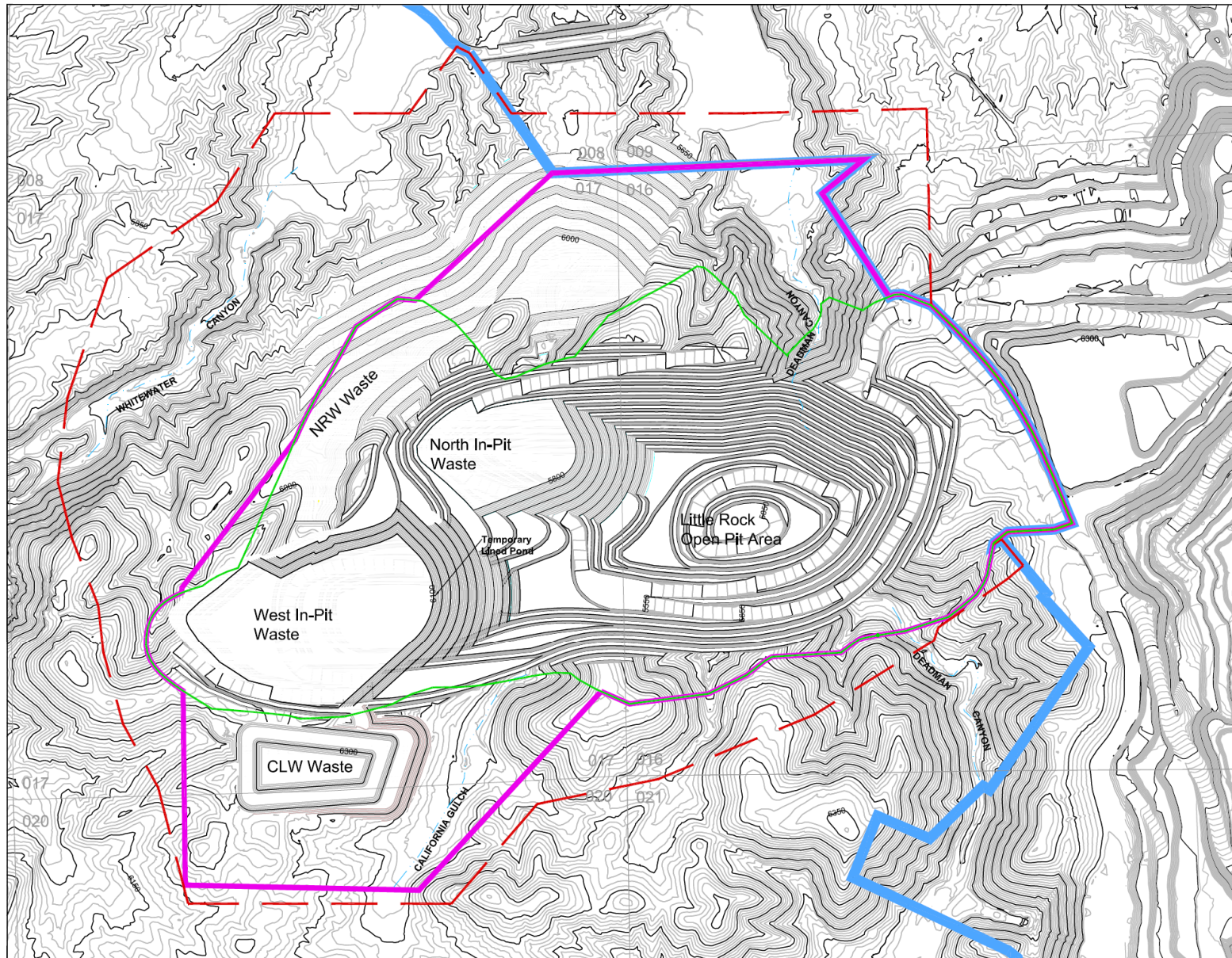


Minor Expansion to Complete Mining Phases at Site Prior to Reclamation

- Minor Configuration Adjustments
 - Open Pit Area
 - In-Pit Waste Stockpiles
 - Removal of Copper Leach Stockpile & Construction of CLW Waste Stockpile
 - Change to Haul Road
- New Facility
 - NRW Waste Stockpile

Life of Mine Configuration

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Comparison of 2014 and 2020 Operation Plans

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Table 1: 2014 vs. 2020 Life of Mine Disturbances (approx. acres)		
Features	2014	2020
Interior Facilities		
Open Pit	328	448
In-Pit Stockpiles	123	186
Exterior Facilities		
Exterior Stockpiles & Western Haul Road	45	132
Linear Facilities	3	3
Other Minor Disturbances	10	10
Totals	391	593
Limit of Disturbance	470	1025

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Closeout Plan and Financial Assurance

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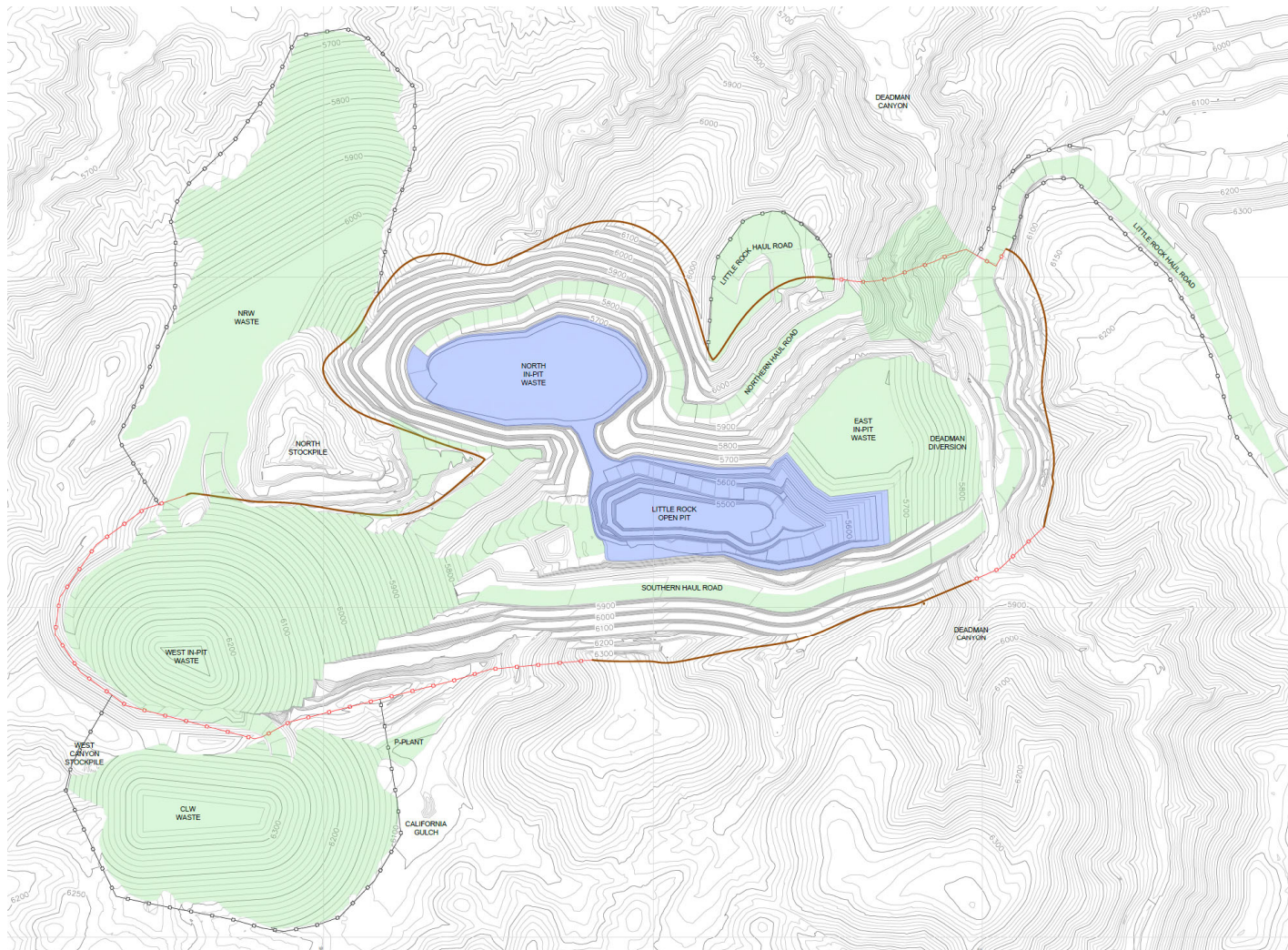
2020 Reclamation Plan - Earthwork

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- Earthwork reclamation plan involves:
 - Regrading and stormwater controls
 - Approved cover material placement
 - Revegetation with approved seed mix
 - Long-term monitoring and maintenance
 - Vegetation and erosion
- Stormwater controls
 - Minimum design: peak flow from 100 year return interval storm event
 - 100 year storm = 1% chance storm will occur in any given year
 - Standard engineering practice and required by regulation
 - Very high standard and exceeds New Mexico design requirements for closure of landfills and highway design
 - Tyrone submitted a work plan to evaluate climate change which applies to Little Rock

Earthwork Reclamation Areas

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Revegetated
Area

Pit Lake

Cost estimate based on

- Approved reclamation plan

Cost estimate calculated as

- Approximately \$8M
- Increase of approximately \$6M

Financial Assurance

- Instrument(s) to be proposed once the cost estimate is approved

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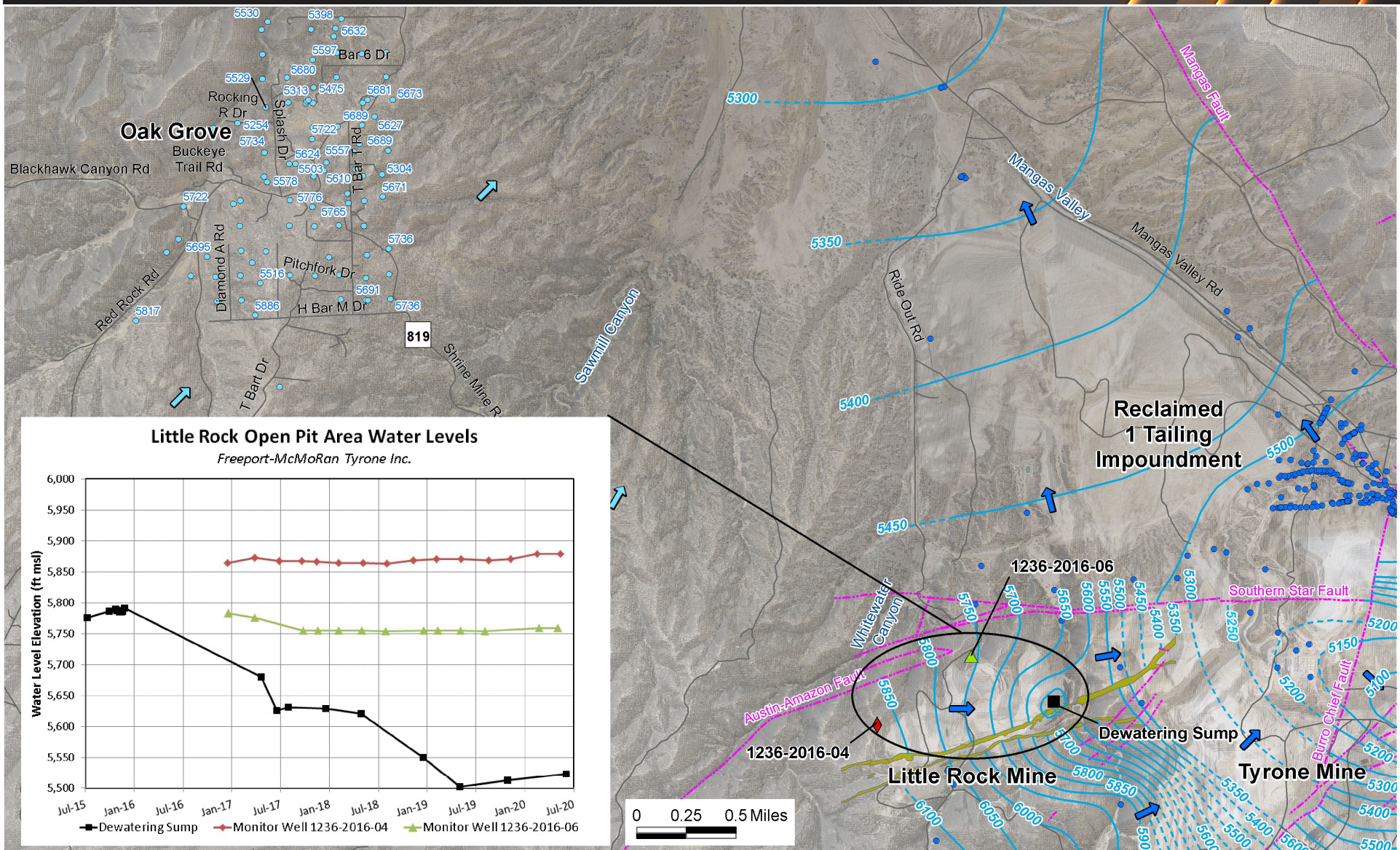
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Water

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Regional Groundwater Levels and Little Rock Mine Dewatering

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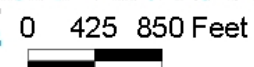


Pit Lake Formation at Closure and Expected Water Quality

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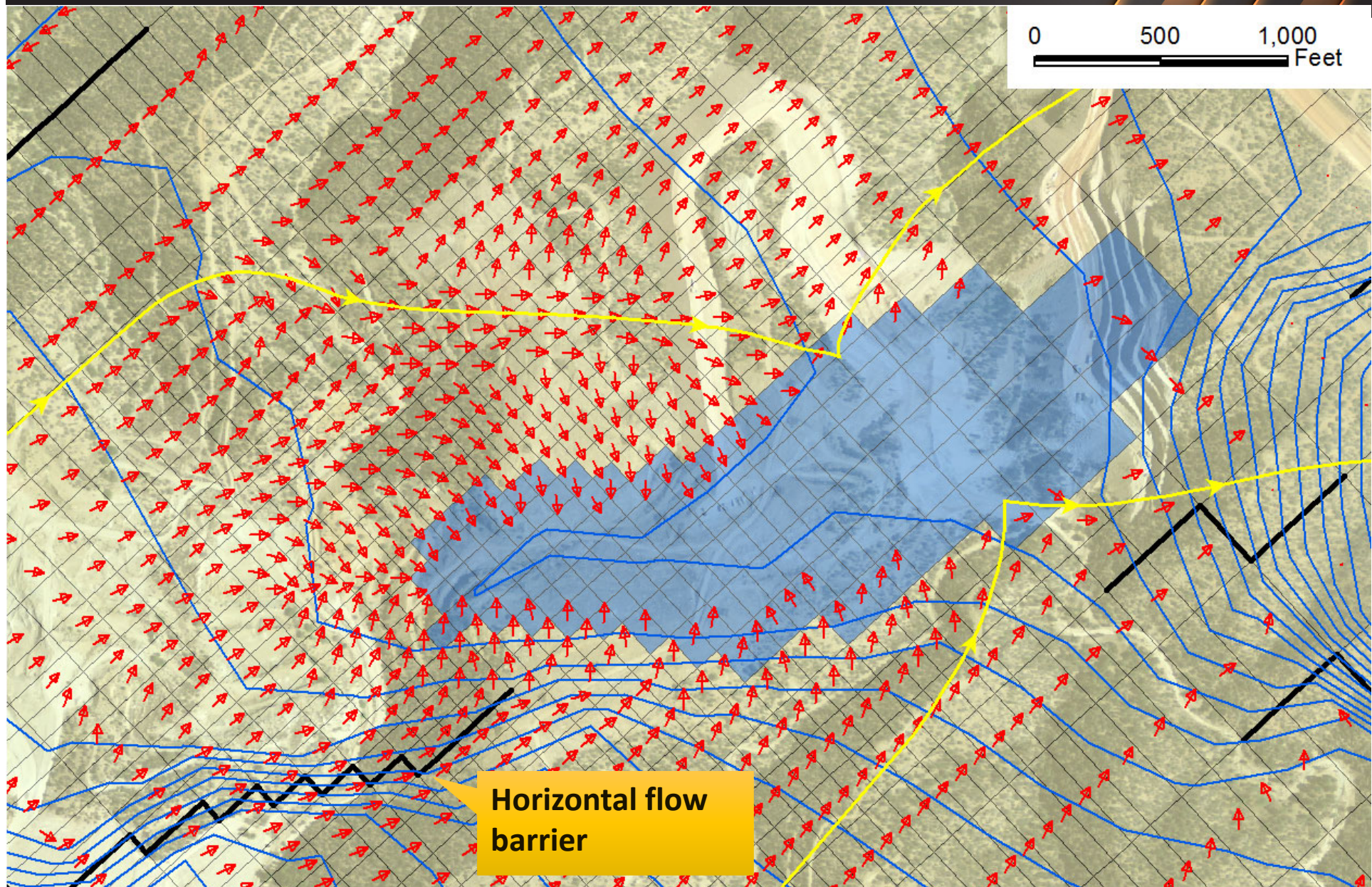
- »» Open pit mined below the regional groundwater table
- »» Currently, no pit lake due to mine dewatering
- »» Pit lake will form at closure after mine dewatering stops
- »» Groundwater flow and geochemical modeling used to predict pit lake conditions

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Simulated Pit Lake and Groundwater Flow Direction at 100 Years

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- »» Pit lake expected to meet applicable water quality standards
 - Geochemical modeling
 - Existing water quality monitoring
- »» Some constituents (e.g., Cu and Se) near standards
- »» Working with NMED in their evaluation of the geochemical model

Simulated Pit Lake Water Quality

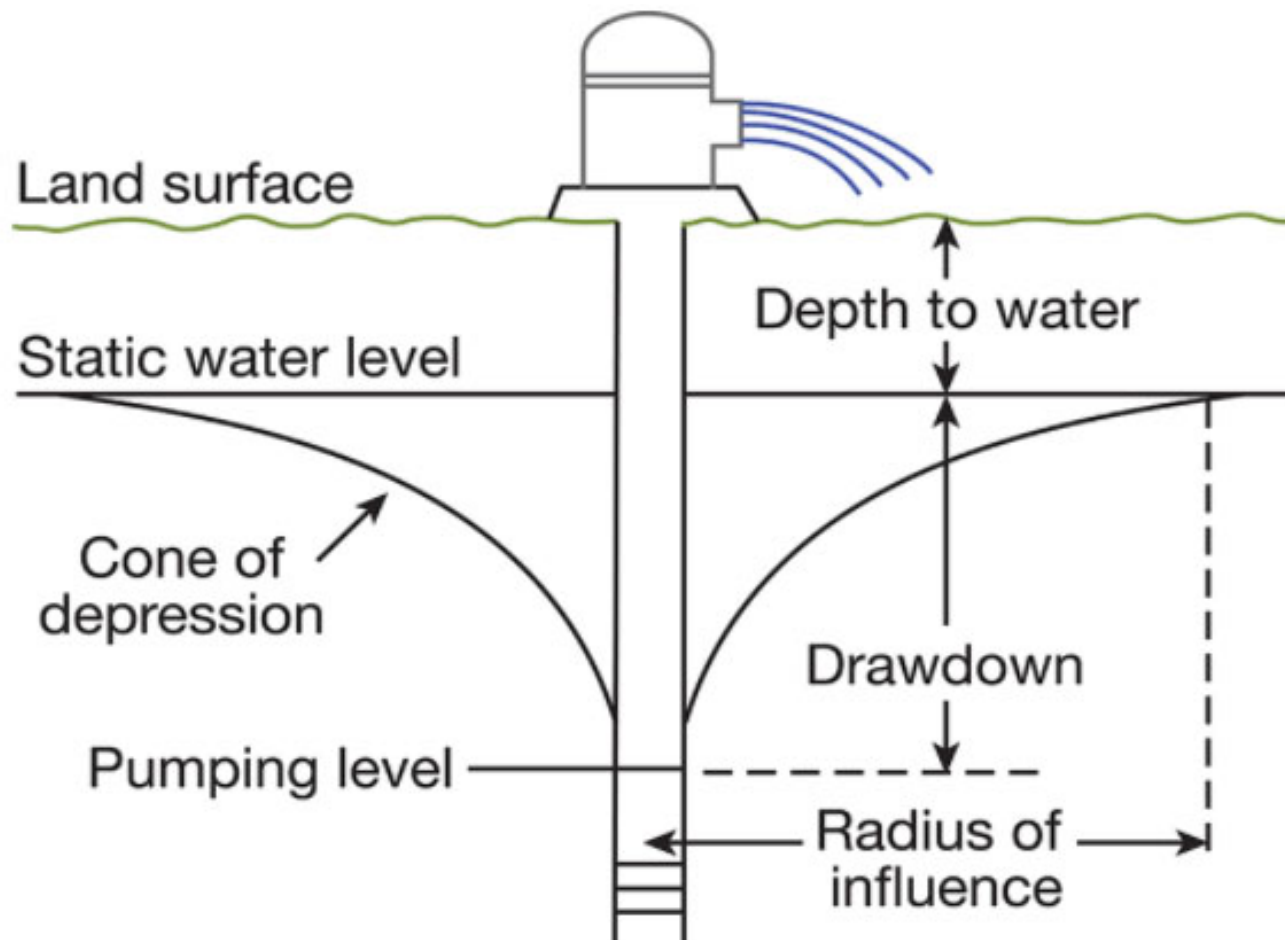
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»» 100 years after closure

Constituent	Concentration (mg/L, unless otherwise noted)	
	<i>Acute aquatic life criteria (20.6.4 NMAC)</i>	Simulated pit lake quality
pH (s.u.)	6.6-9.0	7.84
Copper	0.041	0.037
Selenium, Dissolved	--	0.004
Selenium, Total Recoverable	0.0200	--
Sulfate	--	175
Total dissolved solids	--	647
Calculated hardness (mg/L CaCO ₃)		325

Explanation Drawdown and Cone of Depression

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Environmental Assessments

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- 1994 - Mine Operations Site Assessment
- 1997 - Final Environmental Impact Statement
 - larger study area
 - impact assessment - groundwater, surface water, air quality, wildlife, habitat, community - noise and blasting, cultural resources, visual, etc.
- 2000, 2002, 2005, 2007, 2009, 2010, 2011, 2013, 2014, 2016, 2020 – Updates – MMD, BLM, NMED, USDAFS, OSE, USACE
- Updates are in progress with the proper agencies



1997 EIS

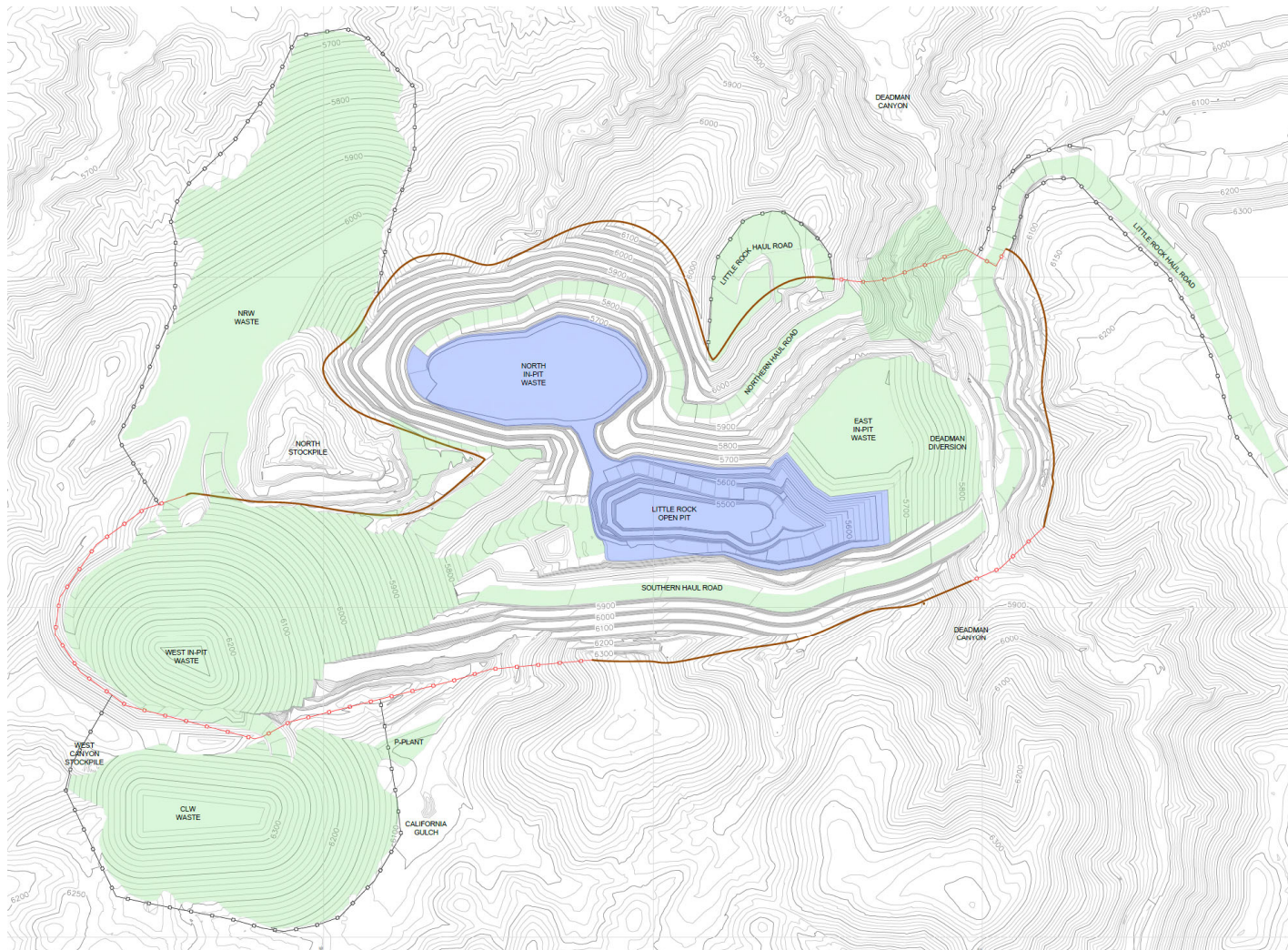


2020 Little Rock Limit of Disturbance



Earthwork Reclamation Areas

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Revegetated
Area

Pit Lake

Reclaimed to Wildlife Habitat

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Award Winning Reclamation

- State Agencies
- Wildlife Habitat Council





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