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REPORT

UPDATED CLOSURE/CLOSEOUT PLAN FOR THE LITTLE ROCK MINE

Prepared for:
New Mexico Environment Department
Ground Water Protection & Remediation Bureau
Runnells Bldg.
1190 St. Francis Dr.
Santa Fe, NM 87505

and

Mining and Minerals Division
Energy, Minerals and Natural Resources Department
Wendell Chino Building~~Piñon Building~~
1220 South St. Francis Dr.
Santa Fe, NM 87505

Submitted By: Freeport-McMoRan Tyrone, Inc.
P.O. Drawer 571
Tyrone, New Mexico 88065

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Golder Associates

elevations and locations and will progress downward as pit excavation advances. The haul road from the Little Rock Mine to the Tyrone Mine and the in-pit haul road that will be present at the EOY 2017 areis shown in **Figure 2-1**.

Commented [Tyrone1]: MMD Comment #9: *"Please show an outline of the proposed new haul road from the Little Rock Mine to the Tyrone Mine on Figure 2-1."*
Tyrone Response: Feature has been added to Figure 2-1 and clarification on the haul roads that are presented in Figure 2-1 has been added to the text in Section 2.1.5.

2.1.6 *Dewatering System and Conveyance Pipelines*

The dewatering system will pump surface water and ground water that accumulates in a sump located at the bottom of the open pit during operations, which allows the mine to operate during normal activities within the open pit and during rain events. Water quality monitoring is addressed in Section 6.3 of this CCP.

Dewatering systems will continue to pump surface water and ground water that accumulates in a sump located at the bottom of the open pit during operations. A series of temporary dewatering sumps will be excavated as the pit is lowered, and water extracted from these sumps is pumped to a booster station consisting of two sumps arranged in series that also serve as settling basins for sediments. Both sumps will be removed by the EOY 2017 as mining progresses within the open pit.

The booster station also receives seepage from the CLDS and CLDS-1 collection trenches. Water from the booster station is then pumped via a diesel powered pump through a 12-inch HDPE pipeline that extends to an existing 10-inch HDPE pipeline (dewatering pipeline alignment #1) that runs to the existing lined 1X1 pond (**Figure 2-1**). It is anticipated that dewatering pipeline alignment #2, extending northward from the open pit, will also be in place by the EOY 2017 to convey surface water and ground water inflow within the eastern portion of the pit to the lined 1X1 pond. This pipeline will also provide the option for redundancy for dewatering pipeline alignment #1, if needed. Post-closure water quality monitoring is addressed in Section 6 of this CCP.

2.1.7 *Other Ancillary Facilities and Structures*

In addition to the major mine components identified above, there are a number of key ancillary facilities and structures dispersed across the mine that support the operations at Little Rock. The ancillary facilities at the Little Rock Mine include: electrical power transmission lines and substations; storm water structures for drainage, diversion, and sediment control; and fencing.

2.2 Past and Current Land Uses

Lands in the vicinity of the mine have historically been used for mining, livestock grazing, timber and fuel wood harvesting, recreation, and wildlife habitat. Ponderosa pine was logged in the Big Burro Mountains south of the Little Rock Mine, and fuel wood has been cut from woodlands in this area for at least a century. Recreation in the area includes camping, picnicking, hunting, off-road vehicle use, hiking, horseback riding, and bicycling.

in-pit operational stockpiles will ultimately be developed within the Little Rock Mine open pit, one of which will be under development by the EOY 2017. At this time, this facility is projected to cover an area of approximately 49 acres and is located to the west of the open pit sump (**Figure 2-1**). The second in-pit stockpile will be located within the northern portion of the open pit and is projected to begin to be developed in 2018. Both in-pit stockpiles shown on **Figures 1-3** will consist primarily of leach cap, and are not anticipated to require additional cover at closure because the materials are non-acid generating, and the leach cap material has few apparent limitations as a plant growth media when compared to the native soils.

As previously described in Section 3.0, the former Copper Leach Stockpile was reclaimed in 2010. The stockpile was covered with three or more feet of leach cap overburden material and is performing well based on the 2013 Vegetation Assessment (Golder, 2014). The 32-acres of reclaimed Copper Leach Stockpile consisted of: approximately 10 acres of top surface, 9 acres of outslopes, 12-acres of perimeter area and 1 acre of reclaimed P-Plant. Since 2010, approximately 2 acres of perimeter area that was seeded as part of the reclamation was removed due to the expansion of the Little Rock Mine open pit. The two overburden stockpiles (the North Stockpile and West Canyon Stockpile) are currently being colonized by native vegetation, are erosionally stable, and no additional reclamation measures are proposed for these two facilities, pending vegetation studies. For the North and West Canyon stockpiles, vegetation and maintenance costs are included in this CCP until financial assurance is released. The vegetation and maintenance costs in Appendix B include maintenance/repair of erosion features, ripping the stockpile surfaces to a depth of 18 to 24 inches, and revegetation. The North Stockpile covers an area of approximately 4 acres, and the West Canyon Stockpile covers approximately 1.5 acres.

Commented [Tyrone2]: MMD Comment #12: *For consistency, it should be noted that according to Tyrone, "reclamation costs are included in this CCP until financial assurance is released. Reclamation costs presented in Appendix B include ripping the stockpile surfaces to a depth of 18 to 24 inches, and revegetation."*
Tyrone Response: Text has been modified in Section 4.1 to clarify that for the North and West Canyon stockpiles, vegetation and maintenance costs are included in this CCP until financial assurance is released. The vegetation and maintenance costs in Appendix B include maintenance/repair of erosion features, ripping the stockpile surfaces to a depth of 18 to 24 inches, and revegetation.

4.2 Open Pit

Open pit mining is projected to continue at the Little Rock Mine for an additional seven years, through 2020. The conceptual end of mine life pit configuration, presented in **Figure 1-3**, will enable mining of approximately 135 million tons of leachable ore, which will be transferred to the adjacent Tyrone facility for copper extraction. Additionally, an estimated 140 million tons of waste rock will be mined to access the leachable ores. The pit configuration at the EOY 2017 will encompass approximately 280 acres within the proposed Mining Area Design Limit, with a total of approximately 104 acres of accessible flat areas targeted for reclamation (**Figure 2-1**).

Predictive ground water flow and geochemical modeling was recently completed by Daniel B. Stephens & Associates (DBS&A) for the Little Rock Mine area to evaluate the rate of rise of the pit lake following cessation of dewatering and the associated estimated water quality of the pit lake water following closure. The predictive modeling results are described in detail in the Groundwater Flow and Geochemical Modeling Report for the Little Rock Mine (DBS&A, 2014), and are summarized below. The reclamation plan for the Little Rock Mine open pit is described in Section 5.2.

- Operation and maintenance of one existing surface water collection point in California Gulch (LRFS-1) and a new point located downgradient of projected LOM pit rim;
- Operation and maintenance of three existing ground water monitoring wells (LRW-4, LRW-5, and 1236-2012-01), and four ground water monitoring wells that will be installed by the EOY 2017 at locations jointly selected by Tyrone and NMED;
- Operation and maintenance of stormwater and surface water diversion structures constructed to route upland flows around the Copper Leach Stockpile and P-Plant reclaimed areas and surrounding impacted areas; and
- Operation and maintenance of Deadman Canyon surface water diversion structure constructed to route upland flows around the Little Rock Mine open pit (note Deadman Canyon surface water diversion structure will be constructed and operational by the EOY 2017).

Commented [Tyrone3]: Tyrone: Added in "stormwater" for clarification.

5.1.2 *Planned Closure/Closeout Activities*

The construction design criteria for the stockpiles and monitoring wells are summarized in **Table 5-1** and the planned approaches for closure of these facilities are described below. Reclamation design drawings for the facilities are presented in **Appendix A**. The planned approaches for closure of the stockpiles include:

- Grading of the in-pit stockpile surfaces in a manner that orients surface water drainage toward the pit bottom and routes storm water along the inside of the benches to the bedrock/rocky material at the stockpile and pit wall contact;
- Grading of the in-pit stockpile top surface to a final grade of between 1 and 5% to direct storm water to slope drainage channels;
- Grading of the in-pit stockpile outslope down to interbench slopes of 3.0H:1V;
- Construction of 32 foot wide terrace benches on the outslope of the in-pit stockpile at maximum slope lengths of 200 feet;
- Ripping of in-pit stockpile top surface and outslope to a depth of 18 to 24 inches;
- Seeding of ripped surfaces of in-pit stockpile to reestablish vegetation in accordance with MMD Permit GR007RE and associated Permit revisions; and
- Plugging and abandonment of any unneeded ground water monitor wells.

5.2 Open Pit

The pit configuration at the EOY 2017 will encompass approximately 280 acres. Accessible pit flat areas and benches not covered by the ultimate pit lake that will form after dewatering is stopped, will be ripped to a depth of 18 to 24 inches and vegetated by seeding with a variety of native and adapted grasses, shrubs, and forbs in accordance with MMD Permit GR007RE and associated Permit revisions.

Temporary erosion control measures will be provided during the construction and early vegetation establishment periods. These measures include, but are not limited to, berms, mulch, straw bales, silt fences, and minor corrective regrading. All construction will be in compliance with state regulations for temporary storm water control.

8.0 CAPITAL AND OPERATION AND MAINTENANCE COST ESTIMATES

This section provides a brief description of the capital and operation and maintenance cost estimate portions of the financial assurance. Cost estimates are budgetary and for the purpose of determining the value of the financial assurance performance bond.

8.1 Capital Cost Estimates

The capital cost estimate has been prepared in accordance with standard engineering practice and is supported with data from various references and is fully documented in **Appendix B**. The capital costs for closure are presented in detail in **Appendix B** and are summarized as follows:

Capital Cost Summary

Item	Subtotal Direct Costs	Subtotal Indirect Costs[1]	Total (Current Cost)
Primary Haul Road	~~$39,900~~$64,000	~~$16,900~~$27,200	~~$56,800~~$91,300
Western Haul Road	~~$29,000~~$30,100	~~$12,300~~$12,800	~~$41,300~~$42,900
North Stockpile[2]	$5,700	$2,400	$8,100
West Canyon Stockpile[2]	$6,000	$2,600	$8,600
Reclaimed Copper Leach Stockpile and P Plant[2]	$39,700	$16,900	$56,600
In-pit Stockpile	~~$438,000~~$428,700	~~$186,100~~$182,200	~~$624,100~~$610,900
Open Pit Flat Areas	~~$137,300~~$112,600	~~$58,300~~$47,900	~~$195,600~~$160,500
Safety Berms and Fencing Around Perimeter of Open Pit	$175,400	$74,500	$249,900
Other Ancillary Facilities and Structures[3]	$122,300	$52,000	$174,300
Allowance for Other Disturbed Areas	$13,200	$5,600	$18,800
TOTAL CAPITAL COST	**~~$1,006,400~~$997,700**	**~~$427,700~~$424,100**	**~~$1,434,100~~$1,421,900**

Note:

[1] – Total indirect costs of 42.5% were applied to the capital direct costs. This includes: 5% for mobilization and demobilization; 7% for contingencies; 6% for engineering redesign fee; 20% for contractor profit and overhead; and 4.5% for project management fee and State procurement costs.

[2] - Area is vegetated, remains in estimate pending vegetation surveys and/or financial assurance release.

[3] – Includes: demolition of power lines, substation, dewatering pipeline; well abandonment; and reclamation of small ancillary facility areas.

Commented [Tyrone4]: Tyrone: Updated capital cost estimate from Telesto received on 4/15/15 based on MMD comments.

8.2 Operation and Maintenance Cost Estimates

The operations and maintenance (O&M) cost estimate details and supporting documentation are provided in **Appendix B**. A summary of these details are provided below. O&M estimated costs related to periodic erosion control, road maintenance, vegetation maintenance, and wildlife monitoring have been included in