



February 11, 2021

Via Electronic Mail

Ms. Mandy Lilla
Freeport-McMoRan Tyrone Inc.
P.O. Box 571
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**Subject: Results of the 2020 Reclamation Cost Estimate
Little Rock Mine Closure/Closeout Plan**

Dear Mandy:

This letter report is an addendum to the reclamation cost estimating process documented in the June 2020 *Earthwork Cost Estimate Process Summary Report* (Telesto, 2020) resulting from the New Mexico Mining and Minerals Division's (MMD's) comments as addressed in the comment response letter (Tyrone, 2021). The letter report updates the input values and documents the results of the reclamation cost estimate (RCE) efforts. Included in this report are additions to the appendices as follows:

- **Appendix A** includes updates to engineering takeoff quantities
- **Appendix B** includes additional calculation documentation
- **Appendix C** has no updates
- **Appendix D.1** tabulates the 2021 labor rates from the New Mexico Department of Labor (NMDOL)
- **Appendix D.2** contains copies of the EquipmentWatch (Penton Media, 2021) sheets from which equipment unit rates were obtained
- **Appendix D.3** provides the curve fits used in the production sheets for dozers and haul trucks.
- **Appendix D.4** provides copies of the pertinent information from RS Means (R.S. Means, 2021) and pages from several editions of the Caterpillar Performance Handbook (CPH).
- **Appendix D.5** provides direct quotes used in the cost estimates.
- **Appendix D.6** provides data and calculations used to prepare the fuel cost
- **Appendix E** provides the RCE cost estimating spreadsheet

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Updates to the figures are as follows:

- **Sheet 8** includes a corrected label for the 'NRW Waste'
- **Sheet 10** includes a new energy dissipator on the proposed downdrain
- **Sheets 3, 6, 7, 8, and 12** include an outline and label for the 'Post Closure Pit Lake Area'

This submittal incorporates 2021 unit costs and labor rates, along with changes to indirect rates and other costing resolutions under the Agreement with the FA Work Group. The FA Work Group involved representatives of Freeport-McMoRan New Mexico Operations (FNMO), MMD, NMED, and Gila Resources Information Project (GRIP).

Table 1 Labor and Equipment Unit Costs

Equipment Description	Type	Fuel Cost (\$/hr)	Total Rental Cost (w/o fuel) (\$/hr)	NMDOL Operator Group	NMDOL Labor Rates	Total Cost (\$/hr)
Cat D11T CD	Dozer	\$56.53	\$191.85	Equipment Operator IV	\$28.65	\$248.38
Cat D9T, SU Blade	Dozer	\$27.27	\$168.55	Equipment Operator IV	\$28.65	\$195.82
Cat D6T, SU Blade	Dozer	\$13.72	\$49.96	Equipment Operator IV	\$28.65	\$63.68
Cat D6T XL, SU Blade	Dozer	\$14.82	\$71.50	Equipment Operator IV	\$28.65	\$86.32
Cat 319D L	Excavator	\$9.98	\$39.88	Equipment Operator VI	\$28.65	\$49.86
Cat 992K	Loader	\$48.70	\$144.58	Equipment Operator VI	\$28.95	\$193.28
Cat 988H	Loader	\$28.88	\$92.03	Equipment Operator VI	\$28.95	\$120.91
Cat 980H	Loader	\$20.52	\$71.06	Equipment Operator VI	\$28.95	\$91.58
Cat 966H	Loader	\$15.92	\$55.80	Equipment Operator VI	\$28.95	\$71.72
Cat 16M	Motor Grader	\$18.05	\$69.61	Equipment Operator IV	\$28.65	\$87.66
Cat 14M	Motor Grader	\$15.75	\$69.61	Equipment Operator IV	\$28.65	\$85.36
Finn B260	Mulcher	\$7.85	\$12.09	Truck Driver III	\$24.57	\$19.94
Cat D11T CD Multi-shank (w/MSR-359H)	Dozer w/Ripper	\$56.53	\$204.92	Equipment Operator IV	\$28.65	\$261.45
Ripper (MSR-189H)	Ripper	--	\$5.01	--	--	\$5.01
Hitachi EX3600-5	Shovel	\$157.17	\$395.50	Equipment Operator VI	\$28.95	\$552.67
Deere 7430	Tractor	\$11.36	\$20.45	Truck Driver III	\$24.57	\$31.81
Cat 769D	Truck	\$18.51	\$76.47	Truck Driver III	\$24.57	\$94.98
Cat 725	Truck	\$11.44	\$56.42	Truck Driver III	\$24.57	\$67.86
Komatsu 730E	Truck	\$63.61	\$162.09	Truck Driver III	\$24.57	\$225.70
Off-Hwy Water Truck,6,000-gal.	Water Truck	\$21.38	\$53.39	Truck Driver III	\$24.57	\$74.77
1 Deck Screening Plant (5X16, 48X60)	Screening Plant	\$9.22	\$66.05	Laborer I	\$23.88	\$75.27
3 Deck Screening Plant (5X16, 42X60)	Screening Plant	\$9.22	\$101.55	Laborer I	\$23.88	\$110.77

Table 2 Miscellaneous Unit Costs

Activity	Base Per Unit Cost	Fuel Per Unit Cost	Units	Source	Reference
Fuel	\$1.90	\$-	gal	-	Diesel fuel cost is estimated by correlating historical local quotes with public data, as agreed upon in November 2018 discussions with the agencies. Fuel cost includes direct and indirect costs at \$1.90/gal.
Revegetation	\$588.26	\$3.12	ac	Revegetation Unit Cost Sheet	See unit rates calculations - Cost is based on a calculated unit rate that includes tractor rental and maintenance, fuel, scarifying, discing, drill seeding, mulching, crimping, seed, and mulch.
Seed	\$222.85	\$-	ac	Quote	Rocky Mountain Reclamation, 4/2018, est. cost for seed at 8.9 PLS/ac, \$210/ac. Escalated 2% 2018-2021= \$222.85/ac
Mulch	\$260.00	\$-	ton	Quote	Rocky Mountain Reclamation, 4/2018, est. cost for hay mulch (nox. weed free, native), \$245/ton). Escalated 2% 2018-2021= \$260.00/ton
Manual Seeding	\$248.64	\$-	day	Means Line Item 329343.10 0560	Planting, trees, shrubs, and ground cover, medium soil, bare root seedlings, 3" to 5", includes planting only
Bench Grading Stockpile	\$1.62	\$0.33	ft	Bench Grading Unit Cost Sheet	See unit rates calculations
Bench Grading Tailings Pond	\$1.62	\$0.33	ft	Bench Grading Unit Cost Sheet	See unit rates calculations
Deadman Diversion Channel Construction	\$482.84	\$-	ft	Quote	See unit rates calculations
Downdrain Construction	\$389.58	\$-	ft	Downdrain Unit Cost Sheet	See unit rates calculations
Downdrain Dissipater	\$15,106.89	\$-	ea	Downdrain Unit Cost Sheet	See unit rates calculations
Channel Construction w/ Riprap	\$7.23	\$1.11	ft	Channel Unit Cost Sheet	See unit rates calculations
Channel Construction w/o Riprap	\$0.48	\$0.10	ft	Channel Unit Cost Sheet	See unit rates calculations
Erosion Control	\$3,014.46	\$310.38	day	Modified Crew B-13A	Erosion control for O&M - includes 1 foreman, 2 laborers, 1 equipment operator, 2 truck drivers, 1 loader (4 cy), 2 dump trucks (8 cy)
Structure Demolition	\$0.23	\$-	cf	Means Line Item 024116.13 0100	Building demolition, large urban projects, mixture of types, excludes foundation demolition, dump fees
Concrete Slab Demolition	\$0.62	\$-	sf	Means Line Item 024116.17 0400	Building footings and foundations demolition, floors, concrete slab on grade, plain concrete, 6" thick, excludes disposal costs and dump fees
Storage Tank Demolition	\$1,059.54	\$-	ea	Means Line Item 130505.75 0530	Selective Demolition - Storage Tanks, steel tank, single wall, above ground, not including foundations, pumps or piping, 5,000 thru 10,000 gallon
Storage Tank Demolition	\$2,098.05	\$-	ea	Means Line Item 130505.75 0540	Steel tank, single wall, above ground, 15,000 thru 30,000 gallon, selective demolition, excluding foundation, pumps or piping
Power Line Demolition	\$0.63	\$-	ft	Means Line Item 260505.10 0370	Electrical Demolition - Nonmetallic sheathed cable 3 wire; assume similar enough in cost to overhead powerlines.
Power Pole Demolition	\$220.56	\$-	ea	Means Line Item 024113.80 0200	Selective Demolition - wood utility poles 35-45 ft high
Pipeline (small HDPE pipe)	\$2.71	\$-	ft	Pipeline Demo Sheet	Selective demolition water, process water HDPE piping; (6 to 8-inch diameter); excludes excavation
Pipeline (large HDPE pipe)	\$6.47	\$-	ft	Pipeline Demo Sheet	Selective demolition water, process water HDPE piping (20 to 36-inch diameter); excludes excavation
Well Plug & Abandon	\$18.90	\$-	ft	Quote	Unit cost of \$18.17/ft is based on a July 2019 direct quote from Layne, A Granite Company (formerly Layne Christensen Company) for a total of 172,631 ft of well and exploration borehole abandonment over 300 days (575 ft/day); the unit cost includes 1 mobilization (\$15,000) and 1 demobilization (\$15,000) spread over 300 days at 575 ft/day. Escalated 2% 2019-2021 = \$18.90
Well Replacement	\$70.50	\$-	ft	Quote	Wilcox Professional Services, 8/2011, est. cost for 5 ½ in bore, \$173,500 for 3000 ft total (\$57.83/ft). Escalated 2% 2011-2021= \$70.50/ft
Seepage Collection Replacement	\$133,355.94	\$-	ea		Est. cost from 2019 Tyrone RCE
Reinforced Concrete Wall Demolition	\$190.58	\$-	hr	Means Crew B-12C	Standard Union Crew: 1 equipment operator (crane), 1 laborer, 1 hydraulic excavator, 2 cy, approximately 40 hrs to demo 200 ft reinforced concrete dam.
Disc harrow attachment, for tractor	\$670.65	\$-	month	Means Line Item 015433.20 1500	Equipment rental costs
Cast-In-Place Concrete	\$262.58	\$-	cy	Means Line Item 033053.40 6200	Structural concrete, in place, gravity retaining wall (3000 psi), includes forms and reinforcement
Cleanup & Disposal of Wastes Requiring Special Handling	\$334.41	\$-	ton	Means Line Item 028120.10 1120/1130	Solid pickup; average of minimum and maximum
Transportation of Wastes Requiring Special Handling	\$4.78	\$-	mile	Means Line Item 028120.10 1260/1270	Transportation to disposal site (Truckload = 80 drums or 25 cy or 18 tons); average of minimum and maximum
Road Maintenance	\$5,285.78	\$1,277.28	month		Road maintenance for O&M - includes one 14M motor grader and one 6,000-gal water truck
Berming	\$0.36	\$-	ft	See Berm Unit Cost Sheet	See unit rates calculations
Livestock Fencing	\$0.15	\$-	ft	Means Line Item 323126.20 0020	Wire fencing & gates, wire fencing general, barbed wire, galvanized, domestic steel, standard, 12-3/4 ga.
Chain Link Fencing	\$24.65	\$-	ft	Means Line Item 323113.20 0800	Fence, chain link industrial, galvanized steel, 6 ga. wire, 2" posts @ 10' OC, 6' high, includes excavation, & concrete, excludes barbed wire
Vehicle Gates, Pit Perimeters	\$957.01	\$-	ea	Means Line Item 323113.20 5070	Fence, chain link industrial, double swing gates, 6' high, 20' opening, includes excavation, posts & hardware in concrete

Signs every 500 ft., pit perimeters	\$73.63	\$-	ea	Means Line Item 101453.20 0600	Signs, guide and directional signs, reflectorized, 12" x 18", excludes posts
Fire Hydrant Demolition	\$398.83	\$-	ea	Means Line Item 024113.23 0900	Utility removal, hydrants, fire, remove only, excludes hauling
Culvert Removal	\$12.46	\$-	ft	Means Line Item 024113.40 0190	Selective demolition, metal drainage piping, CMP, steel, 48"-60", diameter, excludes excavation
Grade Control Wall	\$170.79	\$-	cy	Means Line Item 033053.40 3945	Structural concrete, in place, continuous strip footing (3000 psi), 36" wide x 12" deep, unreinforced, includes forms(4 uses), concrete (Portland cement Type I), placing and finishing, excludes reinforcing
Sludge Removal	\$305.54	\$-	ea	Means Line Item 026510.30 0320	Removal of underground storage tanks, petroleum storage tanks, non-leaking, remove sludge, water and remaining product from tank bottom of tank with vacuum truck, 9,000 - 12,000 gallon tank
Earth Fill Removal (dozer excavate, haul, spread)	\$5.20	\$-	cy	Means Line Item 312316.46 6070	Excavating, bulk, dozer, open site, bank measure, common earth, 700 HP dozer, 300' haul
Concrete Foundation and Metal Arch (excavate and load)	\$1.55	\$-	cy	Means Line Item 312316.46 6010	Excavating, bulk, dozer, open site, bank measure, common earth, 700 HP dozer, 50' haul
Concrete Foundation and Metal Arch (haul and dump)	\$2.87	\$-	cy	Means Line Item 312323.20 5040	Cycle hauling(wait, load, travel, unload or dump & return) time per cycle, excavated or borrow, loose cubic yards, 15 min load/wait/unload, 22 C.Y. truck, cycle 1 mile, 5 MPH, excludes loading equipment
Substation Demo	\$12,266.20	\$-	ea	Substation Unit Cost Sheet	See unit rates calculations
Clay Fill	\$1.59	\$-	cy	Means Line Item 312323.14 5440	Backfill, structural, clay, 300 HP dozer, 300' haul, from existing stockpile, excludes compaction
Transformer	\$1,069.16		Ea.	Means Line Item 260505.10 1570	Transformer, dry type, primary, 3 phase, to 600 V, 750 kVA, electrical demolition, remove, including removal of supports, wire & conduit terminations
Steam Cleaner	\$313.04	\$-	week	Means Line Item 015433.40 6300	Rent steam cleaner 100 gph, Incl. Hourly Oper. Cost.

Means data are obtained from RS Means online (2021) with location adjustment for Las Cruces

RESULTS

The total current dollar cost for earthwork reclamation is estimated to be \$6,963,951 plus \$1,018,368 O&M for a total of \$7,982,319. A summary of the cost estimate is provided in Table 3. The costs presented in this RCE are current (2021) dollar costs.

Table 3 Earthwork Cost Estimate Summary

Item	Direct Cost	Indirect Cost	Total Estimated Cost
Facility		30% of Direct	
West In-Pit Waste	\$1,679,942	\$503,983	\$2,183,924
East In-Pit Waste	\$10,399	\$3,120	\$13,519
CLW Waste	\$601,635	\$180,490	\$782,125
NRW Waste	\$867,318	\$260,195	\$1,127,513
Stockpile Subtotal	\$3,159,293	\$947,788	\$4,107,082
Demolition	\$149,242	\$44,773	\$194,015
Demolition Subtotal	\$149,242	\$44,773	\$194,015
Unplanned Disturbance Area	\$11,330	\$3,399	\$14,729
Other Disturbed Areas Subtotal	\$11,330	\$3,399	\$14,729
Haul Roads	\$18,365	\$5,509	\$23,874
Accessible Flat Areas	\$17,548	\$5,264	\$22,813
Little Rock Open Pit	\$222,579	\$66,774	\$289,353
Deadman Diversion	\$1,631,098	\$489,330	\$2,120,428
Previously Reclaimed	\$1,319	\$396	\$1,715
Seepage Collection Systems	\$0	\$0	\$0
Monitoring & Exploration Wells	\$106,750	\$32,025	\$138,776
Substation, Powerline Corridors, Pipeline Corridors	\$39,360	\$11,808	\$51,168
Miscellaneous Subtotal	\$2,037,020	\$611,106	\$2,648,126
Closure Costs Total	\$5,356,886	\$1,607,066	\$6,963,951
O&M		17.5% of Direct	
Full Site O&M Costs Total	\$866,696	\$151,672	\$1,018,368

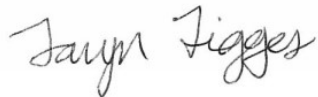
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Item	Direct Cost	Indirect Cost	Total Estimated Cost
Total Cost (Closure + O&M)	\$6,223,582	\$1,758,737	\$7,982,319

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If you have any questions or comments regarding this letter report/addendum, please do not hesitate to contact me or Walt Niccoli.

Sincerely,
Telesto Solutions, Inc.



Taryn Tigges, PE
Engineer

TMT, wln
Enclosure
cc:

REFERENCES

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