Appendix B
Water Management Cost Estimate

Prepared for

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Chino Mines Company
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July 2023

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Appendix B
Water Management Cost

July 2023

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Table of Contents

List of Tables

List of Appendices

1.0 INTRODUCTION

This water management reclamation cost estimate update includes operations and maintenance (O&M), replacement, and removal costs related to post-closure water management for the Continental Mine. Impacted stormwater and seeps are currently captured in ponds and tanks and piped to Chino for treatment and/or inclusion in Chino's process water stream. Following reclamation and establishment of revegetation, infiltration will be reduced, waste rock facility seeps are expected to decrease and eventually cease flowing (Condition 83; Golder, 2009), stormwater runoff from reclaimed surfaces will no longer be impacted and will be released, and the Main Tailings Impoundment (MTI) seeps are expected to decrease and eventually cease flowing. The reduction in the aforementioned sources will decrease the water requiring management. Facilities and post-closure uses, based on the EOY 2026 mine plan, are shown in Table B-1. Water quality monitoring is assumed to continue for a 100-year period.

2.0 TOTAL COST ESTIMATE FOR WATER MANAGEMENT

The total current dollar cost for water management is **$2,697,000**, which includes $608,568 in capital costs plus $2,088,766 in O&M costs (Appendix B.1). A summary of the estimate is provided in Table B-2. The costs presented in this estimate are current (2023) dollar costs.

Table B-1 Water Management Facilities Descriptions

Impoundment Designation	Surface Area (acres)	Mine Use	Liner	Reclamation Schedule
Decant Pond #4	0.62	Seep and Stormwater	HDPE	Removed Reclamation Year 12
Grape Gulch Pond #3	0.38	Stormwater	HDPE	Removed Reclamation Year 12
North Tailings Decant Pond	0.46	Stormwater	Concrete Dam Unlined	Removed Reclamation Year 12
Magnetite Seepage Pond	0.2	Seep and Stormwater	HDPE	Removed Reclamation Year 12
Reclaim Pond	16	Emergency Water Management, Seep and Stormwater	Concrete Dam Unlined	Reclaimed with MTI by Reclamation Year 5
Surge Tank	0.18	Emergency Water Management, Seep and Stormwater	Stainless Steel	Industrial Post Mining Land Use (PMLU)
SWRF Dam 1 (181-2003-Dam 1)	0.52	Stormwater	Concrete Dam Unlined	Removed Reclamation Year 12
SWRF Dam 2 (181-2003-Dam 2)	0.34	Stormwater	Concrete Dam Unlined	Removed Reclamation Year 12
SWRF Dam 3 (181-2003-Dam 3)	0.84	Stormwater	Concrete Dam Unlined	Removed Reclamation Year 12
Upper Creek Containment Pond 1	0.74	Seep and Stormwater	HDPE Lined	Removed Reclamation Year 12
Seeps Routed to Upper Creek Containment Pond 1				
Borehole Seep and Borehole Access Road (Vent Seep)	NA	Seep	Unlined	Seepage ceases flow by Reclamation Year 9
Blackman's Seep	0.01	Seep	HDPE	Removed Reclamation Year 9
East Haul Road & Rock Dam Seep	NA	Seep	Unlined	Seepage ceases flow by Reclamation Year 9
Unnamed Seep	NA	Seep	Unlined	Seepage ceases flow by Reclamation Year 9
Cottonwood Seep	NA	Seep	Unlined	Seepage ceases flow by Reclamation Year 9
Seeps Routed to Decant Pond # 4				
Dam Toe Seep	NA	Seep	Unlined	Seepage ceases flow by Reclamation Year 9
Cement Pond (Replaced by East WRF Containment by EOY 2019)	NA	Seep and Stormwater	HDPE Lined	Seepage ceases flow by Reclamation Year 5, Continue use for Stormwater. Removed Reclamation Year 12
Estrada Seep	NA	Seep	Unlined	Seepage Ceases flow by Reclamation Year 5
Magnetite Seepage Pond (Magnetite Interceptor Trench seepage reports to Magnetite Seepage Pond then to Decant Pond #4)	NA	Seep	Unlined	Seepage Ceases flow and, Reclaimed with Magnetite Tailings Impoundment by Reclamation Year 5
Peach Tree Spring Seep	NA	Seep	Unlined	Seepage ceases flow by Reclamation Year 9
Poison Spring Cut-Off Wall	NA	Seep	Concrete Cut-Off Wall	Seepage ceases flow by Reclamation Year 58
Union Hill Adit Seep	NA	Seep	Unlined	Seepage ceases flow by Reclamation Year 9
Weber Pond	NA	Seep	Unlined	Seepage ceases flow by Reclamation Year 9

Table B-2 Water Management Cost Summary

Item	Direct Cost	Indirect Cost	Total Estimated Cost
Water Management Capital		**30%**	
Ponds	$267,814	$80,344	$348,158
Pumps	$0	$0	$0
Pipelines	$0	$0	$0
Electrical	$0	$0	$0
Subtotal	**$267,814**	**$80,344**	**$348,158**
Capital Removal [1]		**30%**	
Pumps	$0	$0	$0
Pipelines	$157,916	$47,375	$205,291
Electrical Infrastructure	$42,399	$12,720	$55,119
Subtotal	**$200,315**	**$60,095**	**$260,410**
Operations and Maintenance		**17.5%**	
Ponds and Tanks	$227,987	$39,898	$267,885
Pumps	$823,731	$144,153	$967,884
Pipelines	$111,763	$19,559	$131,322
Electrical Infrastructure	$105,547	$18,471	$124,018
Electricity and Fuel (Pumps)	$57,732	$10,103	$67,835
Environmental Sampling	$450,912	$78,910	$529,822
Subtotal	**$1,777,672**	**$311,094**	**$2,088,766**
Total Estimated Cost	**$2,246,000**	**$452,000**	**$2,697,000**

[1] Removal costs for ponds and tanks are included in the earthwork portion of the cost estimate.

3.0 QUANTITY OF WATER TO BE MANAGED

The sources and quantities of water used in the cost estimate were determined by:

- Estimating post-reclamation seepage from MTI drain down (2023 CCP Update, Appendix G)
- Estimating average annual pre-reclamation stormwater runoff (Appendix B.2)
- Estimating average annual post-reclamation stormwater runoff (Appendix B.2)
- Estimating post-reclamation flows from seeps (Table B-3)

Yearly average seepage quantities are summarized in Table B-3. Managed water volumes as a function of time are summarized in Table B-4.

Table B-3 Estimated Stormwater Flow and Seepage Quantities

Seep		Stormwater Volume (acre-ft)	Seepage Volume (acre-ft)	Stormwater Flow Rate, Pre-Reclamation (gpm)	Average Seepage Flow Rate, Pre-Reclamation (gpm)
Main Tailing Impoundment Seeps[1]	Stormwater and Seeps Routed to Upper Creek Containment Pond #1 (excludes Cottonwood Seep)	46.63		28.91	
	Cottonwood Seep	-	3.15	-	1.95
	Upper Creek Containment Pond #1 Average Estimated Yearly Stormwater Runoff[2]	16.35	-	10.14	-
	Estimated Seepage Routed to Upper Creek Containment Pond #1	-	33.43	-	20.73
	Dam Toe Seep	-	116.8	-	72.42
	Peach Tree Spring Seep	-	19.57	-	12.13
	Weber Pond	-	0	-	0.00
	Total Main Tailing Impoundment Seepage	-	169.8	-	105.27
Estrada Seep[2]		-	2.34	-	1.45
Union Hill Adit Seep[2]		-	0.52	-	0.32
Cement Pond[2]		-	1.30	-	0.81
Magnetite Interceptor Trench[2]		-	0.45	-	0.28

4.0 WATER MANAGEMENT COST ESTIMATE

The water management cost estimate is divided into five components: (1) ponds and tanks, (2) pumps, (3) pipelines, (4) electrical infrastructure, and (5) water monitoring. Table B-5 provides a brief description of each worksheet (Sheet) used in the cost estimate (see Appendix B.1). Throughout this document, the items described are followed by a reference to the location of the corresponding calculation Sheet.

[1] Measured 2013 seepage volumes (Golder, 2014)

[2] The estimated yearly stormwater runoff for Upper Creek Containment #1 is based on EOY 2023 mine configuration and calculations (Telesto, 2018)

Table B-4 Water Management Volumes through Time

Reclamation Year	Average SWRDF Seeps (gpm)[3]	Average Main Tailings Impoundment (gpm)[4]	Average Storm Water Runoff (gpm)[5]	Average Magnetite Tailings Impoundment (gpm)[6]	Total Average to Chino via Bull Frog (gpm)
0	2.6	80.4	66.5	0.3	147.2
1	2.6	80.4	66.5	0.3	147.2
2	2.6	80.4	66.5	0.3	147.2
3	2.6	80.4	66.5	0.3	147.2
4	2.6	80.4	66.5	0.3	147.2
5	2.6	80.4	66.5	0.3	147.2
6	0.0	72.3	3.5	0.0	75.8
7	0.0	64.0	3.5	0.0	67.5
8	0.0	56.5	3.5	0.0	60.0
9	0.0	49.9	3.5	0.0	53.4
10	0.0	44.2	3.5	0.0	47.7
11	0.0	39.3	3.5	0.0	42.8
12	0.0	35.2	0.0	0.0	35.2
15	0.0	26.2	0.0	0.0	26.2
25	0.0	12.3	0.0	0.0	12.3
35	0.0	5.0	0.0	0.0	5.0
45	0.0	1.2	0.0	0.0	1.2
55	0.0	0.1	0.0	0.0	0.1
…100	0.0	0.0	0.0	0.0	0.0

Table B-5 Cost Estimate Sheet Descriptions

Worksheet	Description
20230723_ContMine_WaterMgmtRCE.xlsx (Water Management Sheets)	
1 Reclamation and O&M Costs	Ponds/Tanks, Pumps, Pipelines, and Electrical Infrastructure capital and O&M direct cost calculations.
2 Sampling Cost	Post-closure sampling cost development and sampling schedule.
3 WM Cash Flow	Cost over time
4 Summary	Cost summary including indirect cost percentages and direct costs calculated on Sheets 1 and 2

[3] Average seep flow rate at EOY 2026 based on average East WRF, Union Hill, and Estrada Seeps flow rates 2013 (Golder, 2014)
[4] Calculated drain down rates are from 2023 CCP Update, Appendix G
[5] Calculated stormwater runoff for reclaimed areas are from Appendix B.2
[6] Average seep flow rate at EOY 2026 based on average Magnetite Interceptor Trench Seeps flow rates 2013 (Golder, 2014)

Assumptions and methods common throughout the cost estimate include the following:

- Water management variables are provided in Table B-6 and used on Water Management Sheet 1.
- Miscellaneous unit costs are taken from several sources including R.S. Means Heavy Construction Cost Online Data (R.S. Means, 2023). All costs taken from R.S. Means are adjusted in the online data based on the Las Cruces location. Miscellaneous unit costs are summarized in Table C-7 and used on Water Management Sheet "Unit Cost Table". Supporting documentation is included in Appendix B.2.
- Reclamation begins in 2024.
- Infrastructure used for the capture and conveyance of water is removed on or by reclamation year 12 (Table B-1). The Reclaim Pond and all associated infrastructure is removed when the MTI is reclaimed, assumed no later than reclamation year 5. Removal costs for ponds, tanks, and dams are included in earthwork portion of the cost estimate (see 2023 CCP Update, Appendix H).

Table B-6 Water Management Variables

Description	Variable
Steel Tank Life Expectancy (yr)	50
Lined Pond Life Expectancy (yr)	30
Small Concrete Dam Life Expectancy (yr)	50
Pump Life Expectancy (yr)	20
HDPE Pipeline Life Expectancy (yr)	100
Pump / Motor Efficiency	0.70
Reclaim Pond Pump Fuel Consumption Rate (gal/hr)	1.0
Chezy Head Loss Coefficient	150
Power Pole Spacing (ft)	100
Annual Pond Maintenance to Capital Factor	1.5%
Annual Pump Maintenance to Capital Factor	1.5%
Annual Pipeline Maintenance to Capital Factor	1.0%
Annual Electrical Infrastructure Maintenance to Capital Factor	1.5%
Estimated average stormwater runoff non-revegetated (CN=85, gal/year/acre)	48,155
Estimated average stormwater runoff, after 12-year vegetation establishment period (Condition 87 CN=62, gal/year/acre)	2,530
Reclamation Start Year (2026)	0
Reclamation Finished Year	5
Vegetation Established Assume stormwater released	12

Table B-7 Miscellaneous Unit Costs

Activity	Unit	Unit Cost ($/unit)	R.S. Means Item Number	Description
Utility Pole Demo	ea	$196.86	024113800100	Selective demolition, utility poles & cross arms, utility poles, wood, 20'-30' high
Cross Arm Demo	ea	$82.08	024113800300	Selective demolition, utility poles & cross arms, cross arms, wood, 4'-6' long
Wood Electrical Utility Poles a.)	ea	$819.46	337116336020	Electrical utility pole, wood pole CCA/ACA-treated, 30', class 1, type C, excludes excavation, backfill and cast in place concrete
Utility Pole Installation b.)	ea	$1,207.34	337116236010	Electrical utility pole, digging holes in rock, average
Utility Pole Installation d.)	ea	$302.82	337116337600	Electrical utility pole, poles, wood, cross arms with hardware & insulators, 4' long, excludes excavation, backfill and cast in place concrete
Electrical Wiring Installation a.)	wire mile	$560.52	337139130110	Overhead line conductors & devices, conductors, primary circuits, material handling & spotting
Electrical Wiring Installation b.)	wire mile	$22,055.94	337139130150	Overhead line conductors & devices, conductors, primary circuits, per wire, 210 to 636 kcmil
Electrical Wiring Installation c.)	mile	$271.96	337139130810	Overhead line conductors & devices, disposal of surplus material, high voltage conductors
Potential Transformers	ea	$1467.78	337126264100	Station capacitors, potential transformers, 13 to 26 kV
Pipeline Demolition (Flushing and Cover)	lf	$3.75	026510300320	Sludge/water removal at $0.13/ft assuming 18-inch pipe diameter 1/3 full, scaled based on RS Means unit cost to remove sludge/water from 9,000-12,000 (average 10,500) gallon tank at $338.44/each; placement of cover material over pipe at $3.62/ft after sludge/water removal
Excavation of Soil	cy	$6.99	G10301201600 (2)	3/4 C.Y. backhoe, three 8 C.Y. dump trucks, 1 mi round trip; unit rate not presented online, therefore use RS Means 2019 Handbook [hardcopy], 33rd edition with unit rate of $8.40/cy x 0.832 [Las Cruces adjustment] = $7.17/cy
Reservoir Liners HDPE	sf	$2.35	310519531200	Pond and reservoir liners, membrane lining systems HDPE, 100,000 S.F. or more, 60 mil thick, per S.F.
Small Concrete Dam	lf	$91,640	323213103100	Cast-in place retaining walls, reinforced concrete cantilever, 33-degree slope embankment, 10' high, includes excavation, backfill & reinforcing; 250 ft is the assumed length of retaining wall (dam) @ $366.56/lineal ft (RS Means online data)
Water Treatment Tank	ea	$340,712	331623131000	Steel water storage tanks, ground level, ht./diam. less than 1, 250,000 gallons, excl. foundation
Pump	ea	$12,100	-	Engineering Judgment 15 to 30 gpm - includes pump control, control panel, installation, and flow meter
Pump	ea	$18,150	-	Engineering Judgment 50 gpm - includes pump control, control panel, installation, and flow meter
Pump	ea	$30,250	-	Engineering Judgment 100 to 700 gpm - includes pump control, control panel, installation, and flow meter
Pump	ea	$36,300	-	Engineering Judgment 800 to 2000 gpm - includes pump control, control panel, installation, and flow meter
Water Supply Piping	lf	$6.13	331413350100	Water supply distribution piping, piping HDPE, butt fusion joints, 40' lengths, 4" diameter, SDR 21
Water Supply Piping	lf	$7.60	331413350200	Water supply distribution piping, piping HDPE, butt fusion joints, 40' lengths, 6" diameter, SDR 21
Water Supply Piping	lf	$10.22	331413350300	Water supply distribution piping, piping HDPE, butt fusion joints, 40' lengths, 8" diameter, SDR 21
Water Supply Piping	lf	$19.02	331413350400	Water supply distribution piping, piping HDPE, butt fusion joints, 40' lengths, 10" diameter, SDR 21
Water Supply Piping	lf	$15.77	331413350500	Water supply distribution piping, piping HDPE, butt fusion joints, 40' lengths, 12" diameter, SDR 21
Water Supply Piping	lf	$27.63	331413350600	Water supply distribution piping, piping HDPE, butt fusion joints, 40' lengths, 14" diameter, SDR 21
Water Supply Piping	lf	$25.93	331413350700	Water supply distribution piping, piping HDPE, butt fusion joints, 40' lengths, 16" diameter, SDR 21
Facility Water Distribution Piping	lf	$386.77	221113481210, 221113481780	Steel Pipe Schedule 40, black 24" diameter (RS Means 221113481210) $445.00 (material) + $108.35 (labor); unit cost without coupling and hanger (RS Means 221113481780) is reduced 35% for material and 10% for labor
Electric Rate	kWh	$0.0587	-	Industrial rate data 7/23/2023 (http://www.electricitylocal.com/states/new-mexico/silver-city/)
Electric Panel Cost	ea	$12,100	-	Engineering Judgment
Diesel Fuel Cost ($/gal)	gal	$3.92	-	Diesel fuel cost is estimated by correlating historical local quotes with public data
Environmental Sampler	hr	$73	-	Engineering Judgment
Environmental Sampling Reviewer	hr	$85	-	Engineering Judgment
Environmental Sampling	sample	$339	-	23 Constituents. Energy Laboratories, Inc., Quote March 2018-2019 (www.energylab.com) * 1.21 for 2019-2023 inflation(3)
Shipping Environmental Sampling	cooler	$484	-	Overnight UPS $400 for a 10 lb. package 30"x18"x18" Silver City, NM to Casper, WY Energy Labs

1) RS Means Online unit cost includes CCI adjustment for Las Cruces New Mexico - 2023 R.S. Means Online, www.remeansonline.com
2) RS Means Online, 2023 (base rate, CCI adj. 0.832 for Las Cruces)
3) https://data.bls.gov/cgi-bin/cpicalc.pl?cost1=1&year1=201901&year2=202306

- Pond volumes, pipeline lengths and diameters, and flow rates were obtained from 1) *DP-1403 Condition 36 – 2013 Annual Water Management Model Update* letter (Telesto, 2014a) and 2) *Water Management System Analysis and Upgrade Recommendations Report* (Telesto, 2012).
- Capital indirect costs of 30% are applied to the capital direct costs based on discussions involving the FA Work Group as agreed in January 2019. The FA Work Group involved representatives of Freeport-McMoRan New Mexico Operations (FNMO), MMD, NMED, and Gila Resources Information Project (GRIP). The indirect costs include but are not limited to Mobilization and Demobilization, Contingencies, Engineering Redesign Fee, Contractor Profit and Overhead, Project Management Fee, and State Procurement Cost.
- Operations and maintenance indirect costs of 17.5% are applied for long-term O&M direct costs, also as agreed by the FA Work Group for FNMO's RCEs. The indirect costs include but are not limited to Mobilization and Demobilization, Contingencies, Engineering Redesign Fee, Contractor Profit and Overhead, Project Management Fee, and State Procurement Cost.

4.1 Ponds and Tanks

Water management information and costs for ponds and tanks are presented in Appendix B.1 Water Management Sheet 1. Assumptions and methods for this portion of the cost estimate include the following:

- Replacement costs are based on replacement ages from Table B-6 and age at reclamation. The SWRF Dams 1-3 are currently 20 years old, all membrane lined ponds are 30 years old (with the exception of the Upper Creek Containment Pond #1). The Surge Tank will be maintained during the O&M period and not replaced, based on a recent evaluation of the 250,000-gallon steel tank which concluded that the tank is suitable for its current use–only repairs and maintenance are needed as its use continues.
- New and replacement costs for lined ponds assume excavating 1/3 the capacity of the pond and replacing with a double liner.
- The Reclaim Pond and North Tailings Decant Pond require no maintenance beyond what is already included in the Earthwork cost estimate for the site as a whole.

4.2 Pumps

Water management information and costs for pumps are presented in Appendix B.1, Water Management Sheet 1. Assumptions and methods for this portion of the cost estimate include the following:

- All pumps will be rebuilt over time during the first 12 years of O&M, instead of purchasing new pumps. The annual cost for the ongoing rebuilding of each pump is assumed to equal the new pump cost if spread over 12 years of O&M. Upon termination of pumping, each pump will be buried as part of pipeline demolition (flushing and cover operations).
- Pipe head loss calculations use average combined pumping rate when multiple pumps are present.
- Pump operating time was calculated by dividing average annual water volume by the average pump capacity.

4.3 Pipelines

Water management information and costs for pipelines are presented in Appendix B.1 Water Management Sheet 1. Replacement costs are based on replacement ages from Table B-6 and age at reclamation. Pipelines will be demolished by removing the sludge/water and placement of a 3-ft cover over the pipe.

4.4 Electrical Infrastructure

Water management information and costs for electrical infrastructure are presented in Appendix B.1, Water Management Sheet 1. Assumptions and methods for this portion of the cost estimate include the following:

- Electric power lines currently follow major pipeline corridors.
- All power lines are high voltage and require a transformer and electrical panel.

4.5 Water Monitoring

Closure and post-closure monitoring of surface water and groundwater is required in the New Mexico Energy and Natural Resources Department, Mining and Minerals Division (MMD) Permits and DP-1403. Sampling and analysis are quarterly for years 0 through 5, decreasing to semi-annually for years 6 through 12, and then annually thereafter.

Sampling information and costs are presented in Appendix B.1, Water Management Sheet 2. Unit rate information is shown in Table B-7.

5.0 REFERENCES

Energy Laboratories, Inc. 2018. Quote for analytical work (www.energylab.com).

Golder Associates (Golder). 2009. Condition 83 Revised Seepage Investigation Waste Rock Facilities and Main Tailings Impoundment for Supplemental Discharge Plan Condition 83 Requirements Continental Mine, Grant County, New Mexico. March 3, 2009.

Golder Associates (Golder). 2014. Golder Associates Cumulative Seep and Spring Flow Measurements Spreadsheet dated April 2014, Data from 2013 annual total. April 2014.

R.S. Means. 2019. Heavy Construction Cost Data. 33rd Annual Edition. R.S. Means Company, Inc.

Telesto Solutions, Inc. (Telesto). 2012. Water Management System Analysis and Upgrade Recommendations Report. Prepared for Cobre Mining Company, Hurley, New Mexico by Telesto Solutions, Inc., Fort Collins, Colorado. April 2012.

Telesto Solutions, Inc. (Telesto). 2014a. DP-1403 Condition 36 – 2013 Annual Water Management Model Update letter. Prepared for Cobre Mining Company, Hurley, New Mexico by Telesto Solutions, Inc., Fort Collins, Colorado. January 2014.

Telesto Solutions, Inc. (Telesto). 2014b. Continental Mine Closure/Closeout Plan. Prepared for Cobre Mining Company, Hurley, New Mexico by Telesto Solutions, Inc., Fort Collins, Colorado. December 2014.

Telesto Solutions, Inc. (Telesto). 2018. Continental Mine Closure/Closeout Plan Update. Prepared for Cobre Mining Company, Hurley, New Mexico by Telesto Solutions, Inc., Fort Collins, Colorado. May 2018.

APPENDIX B.1
COST CALCULATIONS

Water Management Cost Estimate

Variables

Description	Variable
Steel Tank Life Expectancy (yr)	50
Lined Pond Life Expectancy (yr)	30
Small Concrete Dam Life Expectancy (yr)	50
Pump Life Expectancy (yr)	20
HDPE Pipeline Life Expectancy (yr)	100
Pump / Motor Efficiency	0.70
Reclaim Pond Pump Fuel Consumption Rate (gal/hr)	1.0
Chezy Head Loss Coefficient	150
Power Pole Spacing (ft)	100
Annual Pond Maintenance to Capital Factor	1.5%
Annual Pump Maintenance to Capital Factor	1.5%
Annual Pipeline Maintenance to Capital Factor	1.0%
Annual Electrical Infrastructure Maintenance to Capital Factor	1.5%
Estimated average stormwater runoff non-revegetated (CN=85, gal/year/acre)	48,155
Estimated average stormwater runoff, after 12-year vegetation establishment period (Condition 87 CN=62, gal/year/acre)	25,30
Original CCP Year (2014)	-12
Original Reclamation Start Year (2026) ["0" refers to the beginning of the first year]	0
Reclamation Finished	5
Vegetation Established Assume Stormwater Released Year	12

PONDS AND TANKS

Location	Construction Type	Capacity (gallons)	Capacity (cy)	Pond Area (acres)	Age in 2014 (yr)	Age at Reclamation (yr)	Removal Year** (yr)	First Replacement Year (yr)	Number of Replacements	**Direct Cost New and Replacement ($/ea)**	**Capital Cost New and Replacement ($)**	**Direct Cost Maintenance Ponds ($/yr)**	**Direct Cost O&M Ponds ($)**
SWRF Dam 1 (181-2003-Dam 1)	concrete dam, unlined	1,116,800	5,530	-	19	31	12	-	0	$91,640	$0	$1,375	$17,870
SWRF Dam 2 (181-2003-Dam 2)	concrete dam, unlined	827,700	4,098	-	19	31	12	-	0	$91,640	$0	$1,375	$17,870
SWRF Dam 3 (181-2003-Dam 3)	concrete dam, unlined	2,925,300	14,485	-	19	31	12	-	0	$91,640	$0	$1,375	$17,870
Decant Pond #4	HDPE lined	972,500	4,815	0.62	19	31	12	0	1	$138,154	$138,154	$2,072	$26,940
Upper Creek Containment Pond #1	HDPE lined	1,879,200	9,305	1.29	0	12	12	-	0	$285,784	$0	$4,287	$55,728
Grape Gulch Pond #3	HDPE lined	911,600	4,514	0.38	29	41	12	0	1	$88,315	$88,315	$1,325	$17,221
Blackman's Seep	unlined	25,000	124	-	29	41	9	0	1	$288	$288	$4	$43
Surge Tank***	steel	352,500	1,745	-	49	61	12	0	1	$0	$0	$5,111	$66,439
Magnetite Seepage Pond	HDPE lined	9,600	48	0.20	29	41	12	0	1	$41,057	$41,057	$616	$8,006
									Direct Annual Costs ($/yr):	-	-	$17,538	-
									Direct Cost Subtotals:	-	$267,814	-	$227,987

*Reclaim Pond and North Tailings Decant require no maintenance beyond what is already included in the Earthwork cost estimate for the site as a whole.
**Removal costs are included in earthwork portion of the cost estimate.
***Surge Tank is Industrial PMLU and, therefore, is not removed. Surge tank will not need replacement as its condition is suitable for its current use case, with repairs and maintenance continuing as part of O&M.

Water Management Cost Estimate

Continental Mine
Water Management Worksheet #1

$$H_f = \frac{10.44\,Q^{1.85}}{C^{1.85}\,D_i^{4.8655}}$$

PUMPS

From	To	Number	Age in 2014 (yr)	Age at Reclamation (yr)	Removal Year (yr)	First Replacement Year (yr) [-1 means full replacement not taking place, but rebuilding of pump takes place throughout its operation under O&M]	Number of Replacements	Average Combined Operational Pumping Rate (gpm)	Starting Elevation (ft)	Maximum Elevation (ft)	Head Loss (ft)	Head on Pump (ft)	Power (HP)	Operational Kilowatts (kW)	Stormwater Capture Area, Pumped Water only (acres)	Average Seepage through Reclamation year 5 (gal/year)	Direct Pump Cost New and Replacement ($/replacement)
SWRF Dam 1 (181-2003-Dam 1)	SWRF Dam 3 (181-2003-Dam 3)	2	11	23	12	-1	1	1760	6650	6719	61	130	82	61	120.9	0	$72,600
SWRF Dam 2 (181-2003-Dam 2)	SWRF Dam 3 (181-2003-Dam 3)	2	11	23	12	-1	1	1940	6613	6715	54	156	109	81	48.7	0	$72,600
SWRF Dam 3 (181-2003-Dam 3)	Bullfrog pipeline	2	11	23	12	-1	1	940	6556	6745	11	200	68	51	96.9	0	$60,500
Decant Pond #4	Booster Pump 2	2	20	32	12	-1	1	3000	6688	6700	1	13	14	10	0	18,001,800	$60,500
Booster Pump 2	Surge Tank	2	20	32	12	-1	1	3000	6700	6925	10	235	254	189	0	0	$60,500
Decant Pond #4	Reclaim Pond	2	20	32	5	-1	1	1760	6688	7000	31	343	218	162	0	0	$72,600
Magnetite Interceptor Trench	Magnetite Tailings Seepage Pond	1	20	32	5	-1	1	100	6670	6695	0	25	1	1	0	146643	$18,150
Magnetite Seepage Pond	Decant Pond #4	2	20	32	12	-1	1	100	6695	6750	7	62	2	2	13.1	0	$36,300
Estrada Seep	Decant Pond #4	2	5	17	5	-1	1	45	6575	6688	19	132	2	2	0	762541	$24,200
Union Hill Adit Seep	Decant Pond #4	2	5	17	5	-1	1	30	6575	6688	96	209	2	2	0	169454	$24,200
Poison Spring Cut-Off Wall	Decant Pond #4	1	-9	3	58	17	3	20	6570	6688	36	154	1	1	0	10,512,000	$12,100
Upper Creek Containment Pond #1	Surge Tank	2	-4	8	12	-1	1	1980	6810	6925	358	473	338	252	53.7	0	$72,600
Grape Gulch Pond #3	Surge Tank	2	20	32	12	-1	1	1100	6775	6925	14	164	65	49	6.5	0	$72,600
Blackman's Seep	Upper Creek Containment Pond 1	1	20	32	9	-1	1	125	6775	6810	0	35	2	1	0	0	$18,150
Surge Tank	Reclaim Pond	2	6	18	9	-1	1	3497	6925	7000	26	101	128	95	0	0	$72,600
Reclaim Pond	Surge Tank	1	6	18	5	-1	1	1240	7000	7010	46	56	25	19	316.1	0	$36,300
tailings pipeline flushing																	
Mill No 1	Tailings Impoundment Top	1						4318	6825	7000	13	188	293	219			
Mill No 2	Tailings Impoundment Top	1						4318	6950	7000	13	63	98	73			

*Surge tank to bullfrog pipeline is gravity fed and thus pumping costs are not included.

PUMPS(continued)

		Post Closure Pre Completed Reclamation (Through Reclamation Year 5)					Post Closure Post Completed Reclamation (Reclamation Year 6 to 58)									
From	To	Average Pumping Rate (gal/yr)	Operating Time (hr/yr)	Annual Electrical Usage (kWh/yr)	Direct Annual Operational Cost ($/yr)	Direct Operational Cost ($)	Average Pumping Rate (gal/yr)	Operating Time (hr/yr)	Annual Electrical Usage (kWh/yr)	Direct Annual Operational Cost ($/yr)	Direct Operational Cost ($)	**Direct Pump Cost New and Replacement (O&M) ($)**	**Direct Cost Maintenance Over Yrs 0-12 ($/yr)**	**Direct Cost O&M ($)**	**Direct Cost Removal, Included in Pipeline Demo ($)**	**Direct Cost O&M Electricity and Fuel ($)**
SWRF Dam 1 (181-2003-Dam 1)	SWRF Dam 3 (181-2003-Dam 3)	5,821,940	55.1	3,381	$198	$1,191	305,877	3	178	$10	$73	$72,600	$5,585	$72,600	$0	$1,264
SWRF Dam 2 (181-2003-Dam 2)	SWRF Dam 3 (181-2003-Dam 3)	2,345,149	20.1	1,636	$96	$576	123,211	1	86	$5	$35	$72,600	$5,585	$72,600	$0	$611
SWRF Dam 3 (181-2003-Dam 3)	Bullfrog pipeline	12,833,308	227.5	11,520	$676	$4,057	8,412,245	149	7,552	$443	$3,103	$60,500	$4,654	$60,500	$0	$7,160
Decant Pond #4	Booster Pump 2	19,711,268	109.5	1,105	$65	$389	1,709,468	9	96	$6	$39	$60,500	$4,654	$60,500	$0	$429
Booster Pump 2	Surge Tank	19,711,268	109.5	20,750	$1,218	$7,308	19,711,268	110	20,750	$1,218	$8,526	$60,500	$4,654	$60,500	$0	$15,834
Decant Pond #4	Reclaim Pond	0	0.0	0	$0	$0	0	0	0	$0	$0	$72,600	$5,585	$33,508	$0	$0
Magnetite Interceptor Trench	Magnetite Tailings Seepage Pond	146,643	24.4	17	$1	$6	146,643	24	17	$1	$0	$18,150	$1,396	$8,377	$0	$6
Magnetite Seepage Pond	Decant Pond #4	777,473	129.6	216	$13	$76	179,786	30	50	$3	$21	$36,300	$2,792	$36,300	$0	$96
Estrada Seep	Decant Pond #4	762,541	282.4	450	$26	$159	0	0	0	$0	$0	$24,200	$1,862	$11,169	$0	$159
Union Hill Adit Seep	Decant Pond #4	169,454	94.1	159	$9	$56	0	0	0	$0	$0	$24,200	$1,862	$11,169	$0	$56
Poison Spring Cut-Off Wall	Decant Pond #4	10,512,000	8,760.0	7,267	$427	$2,559	10,512,000	8,760	7,267	$427	$22,609	$36,300	$2,792	$164,746	$0	$25,168
Upper Creek Containment Pond #1	Surge Tank	2,585,924	21.8	5,485	$322	$1,932	135,861	1.1	288	$17	$118	$72,600	$5,585	$72,600	$0	$2,050
Grape Gulch Pond #3	Surge Tank	313,008	4.7	231	$14	$81	16,445	0	12	$1	$5	$72,600	$5,585	$72,600	$0	$86
Blackman's Seep	Upper Creek Containment Pond 1	0	0.0	0	$0	$0	0	0	0	$0	$0	$18,150	$1,396	$13,962	$0	$0
Surge Tank	Reclaim Pond	0	0.0	0	$0	$0	0	0	0	$0	$0	$72,600	$5,585	$55,846	$0	$0
Reclaim Pond	Surge Tank	15,221,796	204.6	-	$802	$4,812	799,733	11	42	$2	$0	$36,300	$2,792	$16,754	$0	$4,812
tailings pipeline flushing																
Mill No 1	Tailings Impoundment Top	5,764,479	22.2	4,865												
Mill No 2	Tailings Impoundment Top	6,800,790	26.2	1,928												
Direct Annual Costs ($/yr):		-	-	-	$3,867	-	-	-	-	$2,133	-	-	$62,362	-	-	-
Direct Cost Subtotals:		-	-	-	-	$23,203	-	-	-	-	$34,529	$0	-	$823,731	$0	$57,732

PIPELINES

From	To	Material	Length (ft)	Inside Diameter (in)	Age in 2014 (yr)	Age at Reclamation (yr)	Removal Year (After Closure) (yr)	Reclamation Replacement Year (yr)	Number of Replacements	Direct Cost New and Replacement ($/ft)	Direct Cost Removal (Demo) ($/ft)	Direct Cost New and Replacement ($/ea)	**Direct Cost New and Replacement ($)**	**Direct Cost Maintenance ($/yr)**	**Direct Cost O&M ($)**	**Capital Cost Removal (Demo) ($)**
SWRF Dam 1 (181-2003-Dam 1)	SWRF Dam 3 (181-2003-Dam 3)	HDPE	4,466	10	11	23	12	-	0	$19.02	$3.75	$84,943	$0	$849	$11,043	$16,748
SWRF Dam 2 (181-2003-Dam 2)	SWRF Dam 3 (181-2003-Dam 3)	HDPE	3,300	10	11	23	12	-	0	$19.02	$3.75	$62,766	$0	$628	$8,160	$12,375
SWRF Dam 3 (181-2003-Dam 3)	Bullfrog pipeline	HDPE	220	6	11	23	12	-	0	$7.60	$3.75	$1,672	$0	$17	$217	$825
Decant Pond #4	Booster Pump 2	HDPE	100	15	20	32	12	-	0	$25.93	$3.75	$2,593	$0	$26	$337	$375
Booster Pump 2	Surge Tank	HDPE	1,936	15	20	32	12	-	0	$25.93	$3.75	$50,200	$0	$502	$6,526	$7,260
Decant Pond #4	Reclaim Pond	HDPE	5,502	12	20	32	5	-	0	$15.77	$3.75	$86,767	$0	$868	$5,206	$20,633
Magnetite Interceptor Trench	Magnetite Tailings Seepage Pond	HDPE	200	5	20	32	5	-	0	$7.60	$3.75	$1,520	$0	$15	$91	$750
Magnetite Seepage Pond	Decant Pond #4	HDPE	1,188	4	20	32	12	-	0	$6.13	$3.75	$7,282	$0	$73	$947	$4,455
Estrada Seep	Decant Pond #4	HDPE	3,470	3	20	32	5	-	0	$6.13	$3.75	$21,271	$0	$213	$1,276	$13,013
Union Hill Adit Seep	Decant Pond #4	HDPE	5,250	2	20	32	5	-	0	$6.13	$3.75	$32,183	$0	$322	$1,931	$19,688
Poison Spring Cut-Off Wall	Decant Pond #4	HDPE	4,200	2	-9	3	58	-	0	$6.13	$3.75	$25,746	$0	$257	$15,190	$15,750
Upper Creek Containment Pond #1	Surge Tank	HDPE	1,770	6	20	32	12	-	0	$7.60	$3.75	$13,452	$0	$135	$1,749	$6,638
Upper Creek Containment Pond #1	Surge Tank	HDPE	1,770	8	20	32	12	-	0	$10.22	$3.75	$18,089	$0	$181	$2,352	$6,638
Grape Gulch Pond #3	Surge Tank	HDPE	861	8	20	32	12	-	0	$10.22	$3.75	$8,799	$0	$88	$1,144	$3,229
Blackman's Seep	Upper Creek Containment Pond 1	HDPE	100	5	20	32	9	-	0	$7.60	$3.75	$760	$0	$8	$76	$375
Surge Tank	Bullfrog pipeline *	HDPE	31,850	8	3	15	12	-	0	$10.22	-	$325,507	$0	$3,255	$42,316	$0
Surge Tank	Reclaim Pond	HDPE	3,923	15	20	32	9	-	0	$27.63	$3.75	$108,392	$0	$1,084	$10,839	$14,711
Reclaim Pond	Surge Tank	HDPE	3,855	9	20	32	5	-	0	$10.22	$3.75	$39,398	$0	$394	$2,364	$14,456
tailings pipeline flushing																
Mill No 1	Tailings Impoundment Top	HDPE	6,850	21												
Mill No 2	Tailings Impoundment Top	HDPE	6,850	21												
												Direct Annual Costs ($/yr):	-	$8,913	-	-
												Direct Cost Subtotals:	$0	-	$111,763	$157,916

*Bullfrog pipeline has an Industrial PMLU

ELECTRICAL INFRASTRUCTURE

From	To	Line (ft)	Number of Poles	Removal Year	Direct Cost Pole and Crossarm ($)	Direct Cost Wiring Installation ($)	Number Transformer Stations	Direct Cost Transformer ($)	Direct Cost Electrical Panel ($)	**Direct Cost New ($)**	**Direct Cost Maintenance ($/yr)**	**Direct Cost O&M ($)**	**Capital Cost Removal ($)**
SWRF Dam 1 (181-2003-Dam 1)	SWRF Dam 2 (181-2003-Dam 2)	1,166	13	12	$30,285	$5,055	2	$2,936	$24,200	$62,475	$937	$12,183	$3,626
SWRF Dam 2 (181-2003-Dam 2)	SWRF Dam 3 (181-2003-Dam 3)	3,300	34	12	$79,207	$14,305	2	$2,936	$24,200	$120,648	$1,810	$23,526	$9,484
SWRF Dam 3 (181-2003-Dam 3)	Road	220	4	12	$9,318	$954	2	$2,936	$24,200	$37,408	$561	$7,295	$1,116
Decant Pond #4	Surge Tank	2,036	22	12	$51,252	$8,826	2	$2,936	$24,200	$87,213	$1,308	$17,007	$6,137
Upper Creek Containment Pond #1, Grape Gulch Pond #3, and Blackman's Seep	Office Area	582	7	12	$16,307	$2,523	1	$1,468	$12,100	$32,398	$486	$6,318	$1,953
Surge Tank	Upper Creek Containment Pond 1	1,770	19	12	$44,263	$7,673	1	$1,468	$12,100	$65,503	$983	$12,773	$5,300
Magnetite Tailings Seepage Pond	Decant Pond #4	1,188	13	5	$30,285	$5,150	1	$1,468	$12,100	$49,003	$735	$4,410	$3,626
Estrada Seep	Road	500	6	5	$13,978	$2,167	1	$1,468	$12,100	$29,713	$446	$2,674	$1,674
Union Hill Adit Seep	Road	727	9	5	$20,967	$3,151	1	$1,468	$12,100	$37,686	$565	$3,392	$2,510
Office Area	Road	2,327	25	12	$58,241	$10,087	1	$1,468	$12,100	$81,896	$1,228	$15,970	$6,974
									Direct Annual Costs ($/yr):	-	$9,059	-	-
									Direct Cost Subtotals:	-	-	$105,547	$42,399

ENVIRONMENTAL SAMPLING, ANALYSIS AND REPORTING [1]

Shipping and Analysis					Reporting						
Shipping (coolers per sample)	Shipping Cost ($/cooler)	Shipping Cost ($/sample)	Analysis ($/sample)	Analysis and Shipping Cost ($/sample)	Labor (hours/sample)	Reporting (hour/sample)	Rate ($/hour)	Review Work per Sample (hours)	Review Work Rate ($/hour)	Reporting Cost ($/sample)	Total Sample Cost ($/sample)
0.14	$ 484	$ 69	$ 339	$ 408	1.0	0.5	$ 73	0.1	$ 85	$ 120	$ 528

[1] Sampling vehicles and equipment are assumed to be included in the routine duty for site personnel.

SAMPLING SCHEDULE AND COST

	Tailings			Stockpiles			Intercept Wells				Sampling		Yearly
Year 0	Quarterly	Semi-Annual	Annual	Quarterly	Semi-Annual	Annual	Quarterly	Semi-Annual	Annual	Total Well Locations	Events Per Year	Cost ($/sample)	Cost ($)
0-5	1			4			2			7	4	$ 528	$ 14,784
5 - 12		1			4			2		7	2	$ 528	$ 7,392
12-99			1			4			2	7	1	$ 528	$ 3,696
												Total Cost Years 0-99	**$ 450,912**

Energy Labs Unit Rates:

23 Constituents. Energy Laboratories, Inc., Quote March 2018-2019 (www.energylab.com) * 1.21 for 2019-2023 inflation(3)

Alkalinity Total as CaCO3	$ 12
Anions by Ion Chromatography	$ 36
Chloride	
Fluoride	
Sulfate	
Total Dissolved Solids	$ 24
Nitrogen - Nitrate+Nitrite as N	$ 54
Metals by ICP/ICPMS, total	$ 194
Aluminum	
Arsenic	
Cadmium	
Calcium	
Chromium	
Cobalt	
Copper	
Iron	
Lead	
Magnesium	
Manganese	
Nickel	
Potassium	
Selenium	
Sodium	
Zinc	
Sample Prep	$ 18.15
	$ 339

Water Management Cash Flow

Continental Mine
Water Management Worksheet #3
7/23/2023

Component	Current Cost
Water Management Capital	$384,459
Capital Removal	$260,410
O&M	$2,088,764
Total	**$2,734,000**

	Water Management			
Cash Flow Year	Water Management Capital Current Cost	Capital Removal Current Cost	O&M Current Cost	Total Water Management Current Cost
1	$348,159	$0	$136,915	$485,074
2	$0	$0	$136,915	$136,915
3	$0	$0	$136,915	$136,915
4	$0	$0	$136,915	$136,915
5	$0	$0	$136,915	$136,915
6	$0	$99,254	$128,230	$227,484
7	$0	$0	$106,150	$106,150
8	$0	$0	$106,150	$106,150
9	$0	$0	$106,150	$106,150
10	$0	$19,612	$106,150	$125,762
11	$0	$0	$96,660	$96,660
12	$0	$0	$96,660	$96,660
13	$0	$121,069	$92,317	$213,386
14	$0	$0	$8,428	$8,428
15	$0	$0	$8,428	$8,428
16	$0	$0	$8,428	$8,428
17	$0	$0	$8,428	$8,428
18	$12,100	$0	$8,428	$20,528
19	$0	$0	$8,428	$8,428
20	$0	$0	$8,428	$8,428
21	$0	$0	$8,428	$8,428
22	$0	$0	$8,428	$8,428
23	$0	$0	$8,428	$8,428
24	$0	$0	$8,428	$8,428
25	$0	$0	$8,428	$8,428
26	$0	$0	$8,428	$8,428
27	$0	$0	$8,428	$8,428
28	$0	$0	$8,428	$8,428
29	$0	$0	$8,428	$8,428
30	$0	$0	$8,428	$8,428
31	$0	$0	$8,428	$8,428
32	$0	$0	$8,428	$8,428
33	$0	$0	$8,428	$8,428
34	$0	$0	$8,428	$8,428
35	$0	$0	$8,428	$8,428
36	$0	$0	$8,428	$8,428
37	$0	$0	$8,428	$8,428
38	$12,100	$0	$8,428	$20,528
39	$0	$0	$8,428	$8,428
40	$0	$0	$8,428	$8,428
41	$0	$0	$8,428	$8,428
42	$0	$0	$8,428	$8,428
43	$0	$0	$8,428	$8,428
44	$0	$0	$8,428	$8,428
45	$0	$0	$8,428	$8,428
46	$0	$0	$8,428	$8,428
47	$0	$0	$8,428	$8,428
48	$0	$0	$8,428	$8,428
49	$0	$0	$8,428	$8,428
50	$0	$0	$8,428	$8,428
51	$0	$0	$8,428	$8,428
52	$0	$0	$8,428	$8,428
53	$0	$0	$8,428	$8,428
54	$0	$0	$8,428	$8,428
55	$0	$0	$8,428	$8,428
56	$0	$0	$8,428	$8,428
57	$12,100	$0	$8,428	$20,528
58	$0	$0	$8,428	$8,428
59	$0	$20,475	$8,428	$28,903
60	$0	$0	$4,343	$4,343

Water Management Cash Flow

Continental Mine
Water Management Worksheet #3
7/23/2023

Component	Current Cost
Water Management Capital	$384,459
Capital Removal	$260,410
O&M	$2,088,764
Total	**$2,734,000**

	Water Management			
Cash Flow Year	Water Management Capital Current Cost	Capital Removal Current Cost	O&M Current Cost	Total Water Management Current Cost
61	$0	$0	$4,343	$4,343
62	$0	$0	$4,343	$4,343
63	$0	$0	$4,343	$4,343
64	$0	$0	$4,343	$4,343
65	$0	$0	$4,343	$4,343
66	$0	$0	$4,343	$4,343
67	$0	$0	$4,343	$4,343
68	$0	$0	$4,343	$4,343
69	$0	$0	$4,343	$4,343
70	$0	$0	$4,343	$4,343
71	$0	$0	$4,343	$4,343
72	$0	$0	$4,343	$4,343
73	$0	$0	$4,343	$4,343
74	$0	$0	$4,343	$4,343
75	$0	$0	$4,343	$4,343
76	$0	$0	$4,343	$4,343
77	$0	$0	$4,343	$4,343
78	$0	$0	$4,343	$4,343
79	$0	$0	$4,343	$4,343
80	$0	$0	$4,343	$4,343
81	$0	$0	$4,343	$4,343
82	$0	$0	$4,343	$4,343
83	$0	$0	$4,343	$4,343
84	$0	$0	$4,343	$4,343
85	$0	$0	$4,343	$4,343
86	$0	$0	$4,343	$4,343
87	$0	$0	$4,343	$4,343
88	$0	$0	$4,343	$4,343
89	$0	$0	$4,343	$4,343
90	$0	$0	$4,343	$4,343
91	$0	$0	$4,343	$4,343
92	$0	$0	$4,343	$4,343
93	$0	$0	$4,343	$4,343
94	$0	$0	$4,343	$4,343
95	$0	$0	$4,343	$4,343
96	$0	$0	$4,343	$4,343
97	$0	$0	$4,343	$4,343
98	$0	$0	$4,343	$4,343
99	$0	$0	$4,343	$4,343
100	$0	$0	$4,343	$4,343
Total	$384,459	$260,410	$2,088,764	$2,733,633

Water Management and Operations and Maintenance Cost Summary

Capital			**Current Value**
DIRECT COSTS	Water Management Capital (Ponds)		$267,814
DIRECT COSTS	Capital Removal (Pipelines and Electrical Infrastructure)		$200,315
INDIRECT COSTS		Indirect Percentage 30.0%	$140,439
		Total Capital	**$608,568**

Operations and Maintenance			
DIRECT COSTS	Ponds and Tanks, Pumps, Pipelines, Electrical Infrastructure		$1,269,028
DIRECT COSTS	Electricity and Fuel (Pump Operation), Environmental Sampling		$508,644
INDIRECT COSTS		Indirect Percentage 17.5%	$311,093
		Total O&M	**$2,088,764**

TOTAL COST	**$2,697,000**

Note Indirect costs are based on 2019 agreement between FMI and the agencies (see Appendix D), and include but are not limited to mobilization and demobilization, engineering redesign fee, contingencies, contractor profit and overhead, pro ect management fee, and state procurement cost.

Water Treatment Unit Costs

Activity	Unit	Unit Cost ($/unit)	RS Means Item Number [1]	Description
tility Pole emo	ea	$196.86	024113800100	Selective demolition, utility poles cross arms, utility poles, wood, 20-30 high
Cross Arm emo	ea	$82.08	024113800300	Selective demolition, utility poles cross arms, cross arms, wood, 4-6 long
Wood Electrical tility Poles a.)	ea	$819.46	337116336020	Electrical utility pole, wood pole CCA/ACA-treated, 30, class 1, type C, e cludes e cavation, backfill and cast in place concrete
tility Pole Installation b.)	ea	$1,207.34	337116236010	Electrical utility pole, digging holes in rock, average
tility Pole Installation d.)	ea	$302.82	337116337600	Electrical utility pole, poles, wood, cross arms with hardware insulators, 4 long, e cludes e cavation, backfill and cast in place concrete
Electrical Wiring Installation a.)	wire mile	$560.52	337139130110	verhead line conductors devices, conductors, primary circuits, material handling spotting
Electrical Wiring Installation b.)	wire mile	$22,055.94	337139130150	verhead line conductors devices, conductors, primary circuits, per wire, 210 to 636 kcmil
Electrical Wiring Installation c.)	mile	$271.96	337139130810	verhead line conductors devices, disposal of surplus material, high voltage conductors
Potential Transformers	ea	$1,467.78	337126264100	Station capacitors, potential transformers, 13 to 26 k
Pipeline emolition (lushing and Cover)	lf	$3.75	026510300320	Sludge/water removal at $0.13/ft assuming 18-inch pipe diameter 1/3 full, scaled based on RS Means unit cost to remove sludge/water from 9,000-12,000 (average 10,500) gallon tank at $338.44/each placement of cover material over pipe at $3.62/ft after sludge/water removal
E cavation of Soil	cy	$6.99	10301201600 [2]	3/4 C.Y. backhoe, three 8 C.Y. dump trucks, 1 mi round trip unit rate not presented online, therefore use RS Means 2019 andbook hardcopy , 33rd edition with unit rate of $8.40/cy 0.854 Las Cruces ad ustment $7.17/cy
Reservoir Liners PE	sf	$2.35	310519531200	Pond and reservoir liners, membrane lining systems PE, 100,000 S. . or more, 60 mil thick, per S. .
Small Concrete am	lf	$91,640	323213103100	Cast-in place retaining walls, reinforced concrete cantilever, 33 degree slope embankment, 10 high, includes e cavation, backfill reinforcing 250 ft is the assumed length of retaining wall (dam) $366.56/lineal ft (RS Means online data)
Water Treatment Tank	ea	$340,712	331623131000	Steel water storage tanks, ground level, ht./diam. less than 1,250,000 gallons, e cl. foundation
Pump	ea	$12,100	-	Engineering udgment 15 to 30 gpm - includes pump control, control panel, installation, and flow meter
Pump	ea	$18,150	-	Engineering udgment 50 gpm - includes pump control, control panel, installation, and flow meter
Pump	ea	$30,250	-	Engineering udgment 100 to 700 gpm - includes pump control, control panel, installation, and flow meter
Pump	ea	$36,300	-	Engineering udgment 800 to 2000 gpm - includes pump control, control panel, installation, and flow meter
Water Supply Piping	lf	$6.13	331413350100	Water supply distribution piping, piping PE, butt fusion oints, 40 lengths, 4 diameter, S R 21
Water Supply Piping	lf	$7.60	331413350200	Water supply distribution piping, piping PE, butt fusion oints, 40 lengths, 6 diameter, S R 21
Water Supply Piping	lf	$10.22	331413350300	Water supply distribution piping, piping PE, butt fusion oints, 40 lengths, 8 diameter, S R 21
Water Supply Piping	lf	$19.02	331413350400	Water supply distribution piping, piping PE, butt fusion oints, 40 lengths, 10 diameter, S R 21
Water Supply Piping	lf	$15.77	331413350500	Water supply distribution piping, piping PE, butt fusion oints, 40 lengths, 12 diameter, S R 21
Water Supply Piping	lf	$27.63	331413350600	Water supply distribution piping, piping PE, butt fusion oints, 40 lengths, 14 diameter, S R 21
Water Supply Piping	lf	$25.93	331413350700	Water supply distribution piping, piping PE, butt fusion oints, 40 lengths, 16 diameter, S R 21
acility Water istribution Piping	lf	$386.77	221113481210 and 221113481780	Steel Pipe Schedule 40, black 24 diameter (RS Means 221113481210) $445 (material) $108.35 (labor) unit cost without coupling and hanger (RS Means 221113481780) is reduced 35 for material and 10 for labor
Electric Rate	kWh	$0.0587	-	Industrial rate data 7/23/2023 (http //www.electricitylocal.com/states/new-me ico/silver-city/)
Electric Panel Cost	ea	$12,100	-	Engineering udgment
iesel uel Cost ($/gal)	gal	$3.92	-	iesel fuel cost is estimated by correlating historical local quotes with public data R Cobre CCP-RCE 2023 Products Reports RCE App Supporting ata for Cost Estimation 6 uel Cost 20210902 uel Cost 230601 Q12023 uelQuote. ls
Environmental Sampler	hr	$73	-	Engineering udgment
Environmental Sampling Reviewer	hr	$85	-	Engineering udgment
Environmental Sampling	sample	$339	-	23 Constituents. Energy Laboratories, Inc., Quote March 2018-2019 (www.energylab.com) 1.21 for 2019-2023 inflation[3]
Shipping Environmental Sampling	cooler	$484	-	vernight PS $400 (2019 rate) for a 10 lb. package 30 18 18 Silver City, M to Casper, WY Energy Labs

(1) RS Means nline unit cost includes CCI ad ustment for Las Cruces ew Me ico - 2023 R.S. Means nline (www.rsmeansonline.com)
(2) RS Means nline., 2023 (base rate, CCI ad . 0.832 for Las Cruces)

APPENDIX B.2
Stormwater Runoff Calculations

TELESTO
SOLUTIONS • INCORPORATED

2950 E. Harmony Rd., Suite 200
Fort Collins, Colorado 80528
970-484-7704 / 970-484-7789 (FAX)

TECHNICAL MEMORANDUM

DATE: **September 30, 2014** **Telesto #** **200189**

TO: **Cobre Mining Company**

FROM: **April Tischer and Jon Cullor**

SUBJECT: **Sample Runoff Calculation: SCS Curve Number Method**

Problem Statement

As part of the 2014 Closure/Closeout Plan Update, Cobre Mining Company must complete a water management cost estimate. As part of the cost estimate, the amount of surface water runoff to be pumped must be estimated so that related costs can be assigned.

Objectives

1. Estimate average annual stormwater runoff pumping rates for disturbed areas and reclaimed areas.

Approach

1. Estimate daily runoff depth using SCS Curve Number Method (USDA, 1986).

2. Use Surface Impoundment Study (Telesto, 2008) curve number for disturbed areas (CN=85) and covered and revegetated areas (CN=62).

3. A stochastic weather generator CLIGEN (USDA, 2004) was used to create a synthetic 100-year daily precipitation record for Ft. Bayard, New Mexico and then the data was scaled for the Continental Mine, such that the mean annual precipitation for the data set is equal to the 18.29 inches (Multiply by 18.26 in/yr / 15.10 in/yr).

4. Use the two CN s with the stochastic precipitation data for years 1-100 to estimate the average yearly runoff for disturbed and reclaimed areas. Divide total depth by 100 yrs to get average annual runoff depth.

5. Developed stormwater basins based on EOY 2026 areas contributing stormwater runoff to surface impoundments used for closure.

6. Use the average annual runoff depth and basin areas to estimate average annual

runoff volume in the water management cost estimate.

Data and Assumptions

1. Disturbed areas have minimal vegetation to limit runoff. Consequently, an average curve number (CN) of 85 was selected for disturbed areas based on recent stormwater modeling efforts. This represents a soil type with high runoff potential and high percentage of impervious area.

2. During post-closure, cover material has been placed and vegetation established. A curve number of 62 has been selected for this condition and represents a soil type in good hydrologic condition with moderate infiltration rates an cover including grass, weeds, and low growing brush (USDA, 1986 Table 2-2d cover type herbaceous , hydrologic soil group B), (Telesto, 2008).

3. CLIGEN command line

   cligen522564.exe -b1 -y100 -iNm293265.par -oFtBa100y

   Runs a 100-year simulation (-y100) beginning in Year 1 (-b1) for Ft Bayard, New Mexico, Indiana, using "Nm293265.par" as the station parameter file, and puts the output into "FtBa100y".

   Notes

   1. FtBa100y.txt renamed to FtBayard100y.txt
   2. FtBayard100y.txt reformatted to FtBayard100y_LineFormat.txt
   3. FtBayard100y_LineFormat.txt FtBayarad100yr.xls

4. Ft. Bayard average annual rainfall = 15.10 in/yr.

5. Cobre average annual rainfall = 18.29 in/yr (SMI, 1999).

6. CobreAd usted100yr.xls ad usted daily data [Ft. Bayard * (18.29/15.100)].

Calculations and Results

Disturbed Areas (CN = 85), the average yearly runoff is 48,155 gal/year/acre

Reclaimed Areas (CN = 62), the average yearly runoff is 2,530 gal/year/acre

See spreadsheet excerpt below.

$$S(in) = \frac{1000}{CN} - 10 \qquad I_a(in) = 0.2\,S$$

$$Q(in/day) = \frac{(P - I_a)^2}{(P - I_a) + S} \quad P > I_a \qquad Q(in/day) = 0 \quad P \le I_a$$

$$Q(gpm) = Q\left(\frac{in}{day}\right) * \frac{1}{12}\left(\frac{ft}{in}\right) * \frac{1}{1440}\left(\frac{day}{\min}\right) * 43560\left(\frac{ft^2}{ac}\right) * 1(ac) * 7.48\left(\frac{gal}{ft^3}\right)$$

Yr	t time (day)	P precipitation (in)	CN curve number	S storativity (in)	Ia initial abstraction (in)	Q runoff depth (in/day)	Q runoff volume (gallons/day)	Q runoff volume (gpm/ac)	Annual Precip
1	44	0.00	85	1.76	0.35	0.000	0	0.0	
1	45	0.00	85	1.76	0.35	0.000	0	0.0	
1	46	0.07	85	1.76	0.35	0.000	0	0.0	
1	47	0.00	85	1.76	0.35	0.000	0	0.0	
1	48	0.00	85	1.76	0.35	0.000	0	0.0	
1	49	0.00	85	1.76	0.35	0.000	0	0.0	
1	50	0.64	85	1.76	0.35	0.041	1,106	0.8	
1	51	0.13	85	1.76	0.35	0.000	0	0.0	
1	52	0.00	85	1.76	0.35	0.000	0	0.0	
1	53	0.00	85	1.76	0.35	0.000	0	0.0	
1	54	0.08	85	1.76	0.35	0.000	0	0.0	
1	55	0.56	85	1.76	0.35	0.021	576	0.4	
1	56	0.00	85	1.76	0.35	0.000	0	0.0	
1	57	0.00	85	1.76	0.35	0.000	0	0.0	
1	58	0.00	85	1.76	0.35	0.000	0	0.0	

References:

Shepherd Miller, Inc. (SMI). 1999. Baseline Characterization of the Hydrology, Geology, and Geochemistry of the Proposed Continental Mine Expansion Pro ect, Cobre Mining Company, Inc. Prepared for Cobre Mining Company, Inc. (Hurley, NM) by Shepherd Miller, Inc. (Fort Collins, CO).

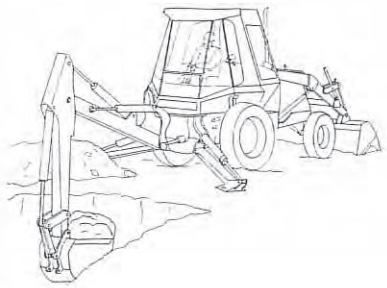
Telesto Solutions, Inc. (Telesto). 2008. Condition 87 Continental Mine Surface Impoundment Study, Revision II, une 2008.

USDA. 1986. Urban Hydrology for Small Watersheds TR-55. Natural Resources Conservation Service, Conservation Engineering Division. Second Edition, une 1986.

USDA. 2004. Cligen Weather Generator v522564, October, 26, 2004.

APPENDIX B.3
Supporting Documents

G1030 Site Earthwork

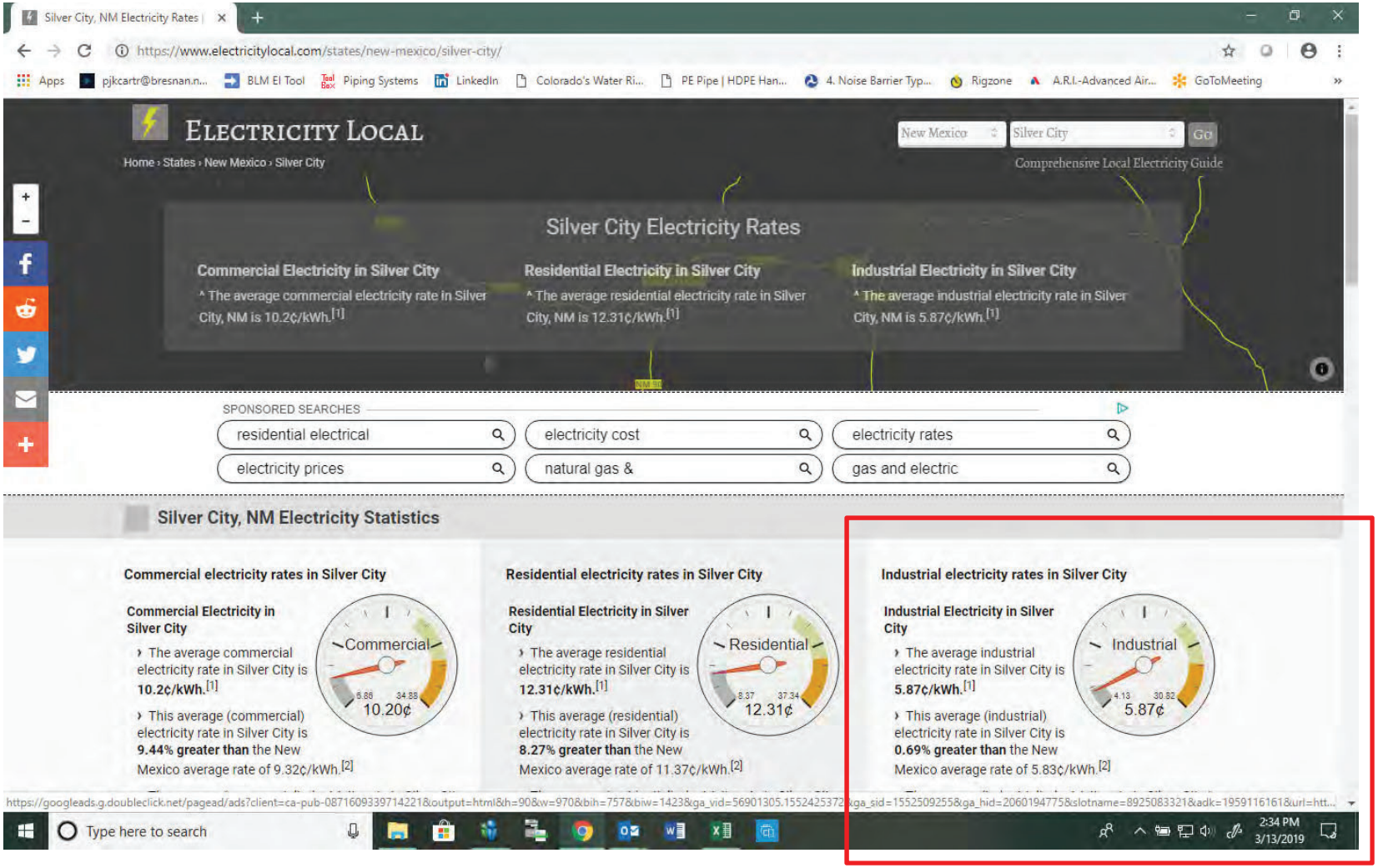


The Excavation of Common Earth System balances the productivity of the excavating equipment to the hauling equipment. It is assumed that the hauling equipment will encounter light traffic and will move up no considerable grades on the haul route. No mobilization cost is included. All costs given in these systems include a swell factor of 25% for hauling.

The Expanded System Listing shows Excavation systems using backhoes ranging from 1/2 Cubic Yard capacity to 3-1/2 Cubic Yards. Power shovels indicated range from 1/2 Cubic Yard to 3 Cubic Yards. Dragline bucket rigs range from 1/2 Cubic Yard to 3 Cubic Yards. Truck capacities range from 8 Cubic Yards to 20 Cubic Yards. Each system lists the number of trucks involved and the distance (round trip) that each must travel.

System Components	QUANTITY	UNIT	COST PER C.Y. EQUIP.	LABOR	TOTAL
SYSTEM G1030 120 1000					
EXCAVATE COMMON EARTH, 1/2 CY BACKHOE, TWO 8 CY DUMP TRUCKS, 1 MRT					
Excavating, bulk hyd. backhoe, wheel mtd., 1/2 C.Y.	1.000	B.C.Y.	.97	2.34	3.31
Hauling, 8 CY truck, cycle 0.5 mile, 20 MPH, 15 min. wait/Ld./Uld.	1.280	L.C.Y.	2.06	3.12	5.18
Spotter at earth fill dump or in cut	.020	Hr.		.99	.99
TOTAL			3.03	6.45	9.48

G1030 120	Excavate and Haul Common Earth	COST PER C.Y. EQUIP.	LABOR	TOTAL
1000	Excavate common earth, 1/2 C.Y. backhoe, two 8 C.Y. dump trucks, 1 MRT	3.03	6.45	9.48
1200	Three 8 C.Y. dump trucks, 3 mile round trip	6	11.05	17.05
1400	Two 12 C.Y. dump trucks, 4 mile round trip	6.55	8.45	15
1600	3/4 C.Y. backhoe, three 8 C.Y. dump trucks, 1 mile round trip	3.05	5.35	8.40
1700	Five 8 C.Y. dump trucks, 3 mile round trip	5.90	10.25	16.15
1800	Two 12 C.Y. dump trucks, 2 mile round trip	5.55	6.50	12.05
1900	Two 16 C.Y. dump trailers, 3 mile round trip	5.25	5.55	10.80
2000	Two 20 C.Y. dump trailers, 4 mile round trip	5.05	5.45	10.50
2200	1-1/2 C.Y. backhoe, eight 8 C.Y. dump trucks, 3 mile round trip	5.70	9.15	14.85
2300	Four 12 C.Y. dump trucks, 2 mile round trip	5.15	5.60	10.75
2400	Six 12 C.Y. dump trucks, 4 mile round trip	6.20	6.50	12.70
2500	Three 16 C.Y. dump trailers, 2 mile round trip	4.25	4.15	8.40
2600	Two 20 C.Y. dump trailers, 1 mile round trip	3.39	3.38	6.77
2700	Three 20 C.Y. dump trailers, 3 mile round trip	4.48	4.27	8.75
2800	2-1/2 C.Y. excavator, six 12 C.Y. dump trucks, 1 mile round trip	3.72	3.80	7.52
2900	Eight 12 C.Y. dump trucks, 3 mile round trip	5.35	5.35	10.70
3000	Four 16 C.Y. dump trailers, 1 mile round trip	3.73	3.44	7.17
3100	Six 16 C.Y. dump trailers, 3 mile round trip	5	4.69	9.69
3200	Six 20 C.Y. dump trailers, 4 mile round trip	4.66	4.31	8.97
3400	3-1/2 C.Y. backhoe, six 16 C.Y. dump trailers, 1 mile round trip	3.98	3.29	7.27
3600	Ten 16 C.Y. dump trailers, 4 mile round trip	5.65	4.69	10.34
3800	Eight 20 C.Y. dump trailers, 3 mile round trip	4.56	3.72	8.28
4000	1/2 C.Y. pwr. shovel, four 8 C.Y. dump trucks, 2 mile round trip	5.40	8.30	13.70
4100	Two 12 C.Y. dump trucks, 1 mile round trip	4.52	5.05	9.57
4200	Four 12 C.Y. dump trucks, 4 mile round trip	6.70	6.85	13.55
4300	Two 16 C.Y. dump trailers, 2 mile round trip	4.80	4.95	9.75
4400	Two 20 C.Y. dump trailers, 4 mile round trip	5.55	5.70	11.25
4800	3/4 C.Y. pwr. shovel, six 8 C.Y. dump trucks, 2 mile round trip	5.25	8	13.25
4900	Three 12 C.Y. dump trucks, 1 mile round trip	4.42	4.38	8.80
5000	Five 12 C.Y. dump trucks, 4 mile round trip	6.80	6.60	13.40
5100	Three 16 C.Y. dump trailers, 3 mile round trip	5.80	5.30	11.10
5200	Three 20 C.Y. dump trailers, 4 mile round trip	5.40	4.94	10.34
5400	1-1/2 C.Y. pwr. shovel, six 12 C.Y. dump trucks, 1 mile round trip	3.90	3.79	7.69
5500	Ten 12 C.Y. dump trucks, 4 mile round trip	6.30	6	12.30


Silver City, NM Electricity Rates
https://www.electricitylocal.com/states/new-mexico/silver-city/
ELECTRICITY LOCAL
Home › States › New Mexico › Silver City
New Mexico
Silver City
Go
Comprehensive Local Electricity Guide
Silver City Electricity Rates
Commercial Electricity in Silver City
^ The average commercial electricity rate in Silver City, NM is 10.2¢/kWh.[1]
Residential Electricity in Silver City
^ The average residential electricity rate in Silver City, NM is 12.31¢/kWh.[1]
Industrial Electricity in Silver City
^ The average industrial electricity rate in Silver City, NM is 5.87¢/kWh.[1]
SPONSORED SEARCHES
residential electrical
electricity cost
electricity rates
electricity prices
natural gas &
gas and electric
Silver City, NM Electricity Statistics
Commercial electricity rates in Silver City
Commercial Electricity in Silver City
› The average commercial electricity rate in Silver City is 10.2¢/kWh.[1]
› This average (commercial) electricity rate in Silver City is 9.44% greater than the New Mexico average rate of 9.32¢/kWh.[2]
Commercial
6.86
34.88
10.20¢
Residential electricity rates in Silver City
Residential Electricity in Silver City
› The average residential electricity rate in Silver City is 12.31¢/kWh.[1]
› This average (residential) electricity rate in Silver City is 8.27% greater than the New Mexico average rate of 11.37¢/kWh.[2]
Residential
8.37
37.34
12.31¢
Industrial electricity rates in Silver City
Industrial Electricity in Silver City
› The average industrial electricity rate in Silver City is 5.87¢/kWh.[1]
› This average (industrial) electricity rate in Silver City is 0.69% greater than the New Mexico average rate of 5.83¢/kWh.[2]
Industrial
4.13
30.82
5.87¢
Type here to search
2:34 PM
3/13/2019

Quote #: C5258
Project Manager: Tessa Parke
Expires: 3/23/2019

Analytical Quote

Jean Humphrey
Telesto Solutions Inc
1303 No Pope
Silver City, NM 88061

TAT: 7 days
QC Level: STD

Project Name: Quarterly Samples

Schedule: Water Samples
Matrix: Aqueous
Comments:

Analyses	Method	Reporting Limit	Analyte Price
Major Ions			
Alkalinity			$10.00
Alkalinity, Total as CaCO3	A2320 B	5 mg/L	**
** Included in Alkalinity Price			
Anions by Ion Chromatography			$30.00
Chloride	E300.0	1 mg/L	**
Fluoride	E300.0	0.1 mg/L	**
Sulfate	E300.0	1 mg/L	**
** Included in Anions by Ion Chromatography Price			
Metals by ICP/ICPMS, Total			$160.00
Calcium	E200.7_8	1 mg/L	**
Magnesium	E200.7_8	1 mg/L	**
Potassium	E200.7_8	1 mg/L	**
Sodium	E200.7_8	1 mg/L	**
** Included in Metals by ICP/ICPMS, Total Price			
Physical Properties			
Solids, Total Dissolved			$20.00
Solids, Total Dissolved TDS @ 180 C	A2540 C	10 mg/L	**
** Included in Solids, Total Dissolved Price			
Nutrients			
Nitrogen, Nitrate + Nitrite			$25.00
Nitrogen, Nitrate+Nitrite as N	E353.2	0.01 mg/L	**
** Included in Nitrogen, Nitrate + Nitrite Price			
Nitrogen, Nitrate as N	E353.2	0.01 mg/L	$0.00

Nitrogen, Nitrite			$20.00
Nitrogen, Nitrite as N	A4500-NO2 B	0.01 mg/L	**

** Included in Nitrogen, Nitrite Price

Metals, Total

Metals by ICP/ICPMS, Total			~~
Aluminum	E200.7_8	0.03 mg/L	**
Arsenic	E200.7_8	0.001 mg/L	**
Cadmium	E200.7_8	0.001 mg/L	**
Chromium	E200.7_8	0.005 mg/L	**
Cobalt	E200.7_8	0.005 mg/L	**
Copper	E200.7_8	0.005 mg/L	**
Iron	E200.7_8	0.03 mg/L	**
Lead	E200.7_8	0.001 mg/L	**
Manganese	E200.7_8	0.001 mg/L	**
Nickel	E200.7_8	0.005 mg/L	**
Selenium	E200.7_8	0.001 mg/L	**
Zinc	E200.7_8	0.01 mg/L	**

** Included in Metals by ICP/ICPMS, Total Price

~~ Included in Major Ions Metals by ICP/ICPMS, Total Price

Preps For Water Samples

Metals Preparation by EPA 200.2	E200.2	$15.00

Schedule Price/Sample: $280.00

Schedule Name	Schedule Total
Water Samples	$280.00

Quote Sub Total:	$280.00
Discount:	0.00%
Misc Charges:	$0.00
Quote Total:	$280.00

Comments: As of January 1st, 2012 ELI will begin charging a $2.00 per sample surcharge for sample management. This fee will be applied to all solid and aqueous samples.

Quoted prices are based on net 30 days payment of invoices. Discounts will not apply if terms are not met.

Quoted prices reflect standard turn around time of ~7 working days. Additional charges may apply for accelerated TAT. Please advise ELI as to your project specific requirements.

To assure that the quoted analysis and pricing specifications are provided, please include the Quote ID number referenced above on the Chain of Custody or sample submittal documents.