

Mill 502/Air Effluent Treatment Plant - Page .

| | Unit Loaded Labour Cost: | \$27.00 | LABOUR M/H | LABOUR COST | MATERIAL | OTHER SERVICES | TOTAL |
|--|--------------------------|---------|---------------|----------------|--------------|----------------|--------------|
| Reaction Tanks | | | | | | | |
| Base Preparation | | | | | | | |
| 1. Prepare crushed, compacted gravel (-1" + 3/4") pad for reaction tanks | | | | | | | |
| Size of Pad: 115' x 55' => 6,325 sq ft | | | | | | | |
| Estimated gravel required: depth 3' x 6,325 sq ft => 703 cubic yards | | | | | | | |
| 2 men(loader op & Truck driver/labourer) x 12 hours per day x 14 days | | | 336 | \$9,072.00 | | | |
| 703 cubic yards x 3 tons/yd3 x \$10/ton | | | | | \$21,090.00 | | |
| 2 week rental of portable compactor | | | | | | \$2,500.00 | \$32,662.00 |
| 2. Install HDPE spill liner and berm | | | | | | | |
| HDPE Liner - 80 mil: 115' x 55' x 5% allowance for seam overlap => 6641 sq. ft. | | | | | | | |
| 4 men x 12 hours/day x 7 days | | | 336 | \$9,072.00 | | | |
| 6641 sq ft of liner x \$4.00/ft2 | | | | | \$26,564.00 | | |
| 1 week rental of seam fusing machine | | | | | | \$1,000.00 | \$36,636.00 |
| Gravel for Berm (3 ft high @ 1:1 slopes): 120 cubic yards | | | | | | | |
| 2 men(loader op & labourer) x 12 hours/day x 7 days | | | 168 | \$4,536.00 | | | |
| 120 cubic yards x 3 tons/yd3 x \$10/ton | | | | | \$3,600.00 | | |
| 1 week rental of portable compactor | | | | | | \$1,000.00 | \$9,136.00 |
| 3. Form and Pour concrete sump: 4' x 4' x 4' deep | | | | | | | |
| 2 men x 12 hours/day x 4 days | | | 96 | \$2,592.00 | | | |
| 4 cubic yards x \$200/yd3 + \$200 of lumber | | | | | \$1,000.00 | | \$3,592.00 |
| Tank Installation | | | | | | | |
| 4. Dissassemble and reassemble three 25' diameter x 15' high bolted steel tanks | | | | | | | |
| Each Tank has 78.5' x 15' => 1,178 sq ft of wall | | | | | | | |
| Assume wall panels are 4' x 8' => 40 panels per tank | | | | | | | |
| Assume new gaskets and bolts are required | | | | | | | |
| 4 men x 12 hours/day x 28 days | | | 1344 | \$36,288.00 | | | |
| New gaskets & Bolts + slings & welding gasses & rods | | | | | \$10,000.00 | | |
| Rental of boom truck for 28 days @ \$60/hr + scaffolding & Air Compressor | | | | | | \$25,000.00 | \$71,288.00 |
| 5. Fabricate and install agitator bridge for each tank (3 bridge structures) | | | | | | | |
| Assume the agitator bridges will have to be supported from the ground | | | | | | | |
| Two of the bridges will have to be strong enough to accomodate higher torque mixing | | | | | | | |
| 4 men x 12 hours/day x 10 days/bridge x 3 units | | | 1440 | \$38,880.00 | | | |
| 10 tons of steel per bridge & support x 3 units x \$460/ton + | | | | | | | |
| \$2,500 of hardware, welding materials, etc. | | | | | \$17,500.00 | | |
| Crane rental for 4 days per bridge @ \$60/hr x 3 units | | | | | | \$8,640.00 | \$65,020.00 |
| Fabricate and install walkways c/w handrails across all three reaction tanks (75 feet). | | | | | | | |
| 2 men x 12 hours/day x 2 days/tank x 3 units | | | 144 | \$3,888.00 | | | |
| 4 tons of steel per tank x 3 units x \$500/ton | | | | | \$6,000.00 | | |
| Crane rental for 2 days per tank @ \$60/hour x 3 units | | | | | | \$4,320.00 | \$14,208.00 |
| Fabricate and install two access stairways to tank #1 & 3 | | | | | | | |
| 1 man x 12 hours/day x 7 days | | | 84 | \$2,268.00 | | | |
| 3 tons of steel x \$500/ton | | | | | \$1,500.00 | | \$3,768.00 |
| 6. Purchase of two high shear agitator mechanisms for 25' dia by 15' high tank | | | | | | | |
| c/w 150 to 200 Hp electric motors and motor control centres | | | | | \$200,000.00 | | \$200,000.00 |
| 7. Purchase of one low shear agitator mechanism for 25' dia by 15' high tank | | | | | | | |
| c/w 35 to 50 Hp electric motor and motor control centre | | | | | \$75,000.00 | | \$75,000.00 |
| 8. Installation of all three agitator mechanisms, shafts and blades | | | | | | | |
| 4 men x 12 hours/day x 7 days | | | 336 | \$9,072.00 | | | |
| Miscellaneous hardware | | | | | \$1,000.00 | | |
| Crane rental for 7 days @ \$60/hr | | | | | | \$5,040.00 | \$15,112.00 |
| 9. Fabrication and installation of 8" diameter feed and discharge nozzle on tank #1, 2 and 3 | | | | | | | |
| 1 man x 3 days x 12 hours/day | | | 36 | \$972.00 | | | |
| Miscellaneous pipe, steel flanges & hardware | | | | | \$1,000.00 | | \$1,972.00 |
| 10. Fabrication and installation of one upcomer pipe (12" dia) on each tank | | | | | | | |
| 2 men x 12 hours/day x 3 days | | | 72 | \$1,944.00 | | | |
| 2 x 20' lengths of 12" dia schedule 40 steel pipe + Welding supplies | | | | | \$4,000.00 | | |
| Crane rental for 3 days @ 60/hr | | | | | | \$2,160.00 | \$8,104.00 |

| | | | | | |
|---|-----|-------------|-------------|------------|-------------|
| 11. Fabrication and installation of three wall mounted baffles in each tank 2 men x 12 hours/day x 3 days/tank x 3 tanks 3 tons of steel/tank x 3 tanks x \$500/ton Crane rental for 3 days per tank x 3 tanks @ \$60/hr | 216 | \$5,832.00 | \$4,500.00 | \$6,480.00 | \$16,812.00 |
| Installation of Piping and Pumps | | | | | |
| 12. Feed Line to Reaction Tanks - 8" HDPE Assume 1000 linear feet of 8" diameter HDPE pipe (New) 3 men x 12 hours/day x 7 days 1000 feet of 8" HDPE pipe @ \$12/ft | 252 | \$6,804.00 | \$12,000.00 | \$0.00 | \$18,804.00 |
| Assume 2 x 8" diameter knife gate valves (TRP) 2 men x 12 hours/day x 2 days 2 valves with air actuators @ \$2,500 each | 48 | \$1,296.00 | \$5,000.00 | \$0.00 | \$6,296.00 |
| Assume 4 x 90 degree elbows and 4 flange sets (TRP) | | | \$2,500.00 | \$0.00 | \$2,500.00 |
| 13. Feed line between tank #1 and 2 - 8" HDPE Assume 10 feet of pipe with no elbows flanged at each end 1 man x 12 hours/day x 1 day Miscellaneous pipe & Flanges | 12 | \$324.00 | \$600.00 | \$0.00 | \$924.00 |
| 14. Feed line between tank #2 and 3 - 8" HDPE Assume 10 feet of pipe with no elbows flanged at each end 1 man x 12 hours/day x 1 day Miscellaneous pipe & Flanges | 12 | \$324.00 | \$600.00 | \$0.00 | \$924.00 |
| 15. Overhaul and install two 10 x 8 SRL pumps at discharge of #3 tank Assume pumps, motors and motor control centres are available from TRP but require rebuild Assume one pump running, one on standby 2 men x 12 hours/day x 4 days (2 days per pump) New suction and discharge side liners, impeller and bearings (\$3,000/pump) | 96 | \$2,592.00 | \$6,000.00 | \$0.00 | \$8,592.00 |
| Fabrication and installation of pumpbox 6' x 6' x 6' high with two 10" discharge nozzles 2 men x 12 hours/day x 7 days 3 tons of steel x \$500/ton | 168 | \$4,536.00 | \$1,500.00 | \$0.00 | \$6,036.00 |
| Tank to Pumpbox - assume 10 feet of 8" diameter pipe flanged at both ends - HDPE 1 man x 12 hours/day x 1 day Miscellaneous pipe, flanges and hardware | 12 | \$324.00 | \$1,000.00 | \$0.00 | \$1,324.00 |
| Assume 1 x 8" 90 degree elbows (from TRP) Pumpbox to discharge pumps - assume 2 x 8" knife gate valves (TRP) 1 man x 12 hours/day x 1 day | 12 | \$324.00 | \$0.00 | \$0.00 | \$324.00 |
| Assume one 8" x 8" x 8" flanged end pipe wye to be fabricated or purchased and installed 1 man x 12 hours/day x 2 days Miscellaneous 8" pipe, flanges and hardware | 24 | \$648.00 | \$1,000.00 | \$0.00 | \$1,648.00 |
| 16. Install heated building over 10 x 8 Discharge pumps Assume steel insulated building 20' x 10' x 10' high with double wide doors 4 men x 12 hours/day x 8 days Purchase of steel frame building + cladding (\$50/sq ft) | 384 | \$10,368.00 | \$10,000.00 | \$0.00 | \$20,368.00 |
| Concrete footing for building 2 men x 12 hours/day x 2 days 2.5 cubic yards of concrete @ \$200/yd3 + \$200 of lumber | 48 | \$1,296.00 | \$700.00 | \$0.00 | \$1,996.00 |
| Purchase and installation of two electric space heaters for building 1 man x 12 hours/day x 1 day purchase of 2 space heaters + power supply cable | 12 | \$324.00 | \$1,000.00 | \$0.00 | \$1,324.00 |
| 17. Discharge Line between the mill and the TRP Thickener - 8" HDPE Assume 3600 feet of new 8" diameter HDPE pipe to be purchased and installed Assume HDPE welded construction 3 men x 12 hours/day x 4 days 3,600 feet of 8" diameter HDPE pipe @ \$12/foot | 144 | \$3,888.00 | \$43,200.00 | \$0.00 | \$47,088.00 |
| Assume two 8" x 8" x 6" tees and two 6" drain valves required 1 Tee + 2 x 6" valves + couplings and hardware | 0 | | \$3,000.00 | \$0.00 | \$3,000.00 |
| One drain at the pump end and one at the central tailings pond | | | | | |

18. Roadbed for Discharge line between the mill and the TRP Thickener

Assume 1800 feet of 10 foot wide roadbed to be constructed along edge of central pond

Assume 3500 cubic yards of run of mine waste rock

400 truck loads x 0.5 hours per trip => 200 manhours

200 \$5,400.00 \$0.00 \$0.00 \$5,400.00

Instrumentation

19. Mass Flowmeter on feed line to tank #1 (Available from TRP)

Relocation of mass flowmeter (Flowmeter and Density gauge) from the TRP

to the 8" diameter feed line to #1 Tank

2 men x 12 hours/day x 2 days

48 \$1,296.00

Miscellaneous hardware

\$250.00

\$0.00

\$1,546.00

Output signal and power cable installation associated with the mass flowmeter

1 man x 12 hours/day x 2 days

24 \$648.00

Miscellaneous cable & hardware

\$1,000.00

\$0.00

\$1,648.00

20. Installation of 3 pH controllers - Tank #1, Tank #3 and in pumpbox after tank #3

1 man x 12 hours/day x 3 days

36 \$972.00

Miscellaneous mounting hardware

\$500.00

\$0.00

\$1,472.00

Output signal and power cable installation associated with the pH controllers

1 man x 12 hours/day x 3 days

36 \$972.00

Miscellaneous mounting hardware & cable

\$1,000.00

\$0.00

\$1,972.00

TRP Thickener

Winterization of TRP Thickener

1. Installation of building enclosure around bottom of thickener

Concrete footing

2 men x 12 hours/day x 7 days

168 \$4,536.00

10 cubic yards of concrete @ \$200/yd3 + \$500 of lumber

\$2,500.00

\$0.00

\$7,036.00

Steel enclosure c/w siding and insulation around bottom of thickener

- 270 feet of perimeter by an average of 15 feet in height => 4,050 sq ft

4 men x 12 hours/day x 14 days

672 \$18,144.00

4,050 square feet of wall surface x \$15/sq ft

\$60,750.00

\$0.00

\$78,894.00

2. Insulation and cladding around thickener tank

- perimeter of 270 feet by 10 feet high => 2700 square feet

2 men x 12 hours/day x 7 days

168 \$4,536.00

2,700 square feet of wall surface x \$15/sq ft

\$40,500.00

\$0.00

\$45,036.00

3. Insulate and clad around the thickener feed tank (Dewater Tank)

- perimeter of approximately 35' by 15' high => 525 sq ft

2 men x 12 hours/day x 2 days

48 \$1,296.00

525 square feet of wall surface x \$15/sq ft

\$7,875.00

\$0.00

\$9,171.00

4. Enclosure over top of thickener

5,024 square feet @ \$40 per square foot of building enclosure

\$200,960.00

\$200,960.00

5. Building enclosure over thickener overflow tank and pumps

Purchase and erection of an insulated steel clad frame building

Approximate dimensions: 20' x 20' x 20' high

Alternative is to relocate thickener overflow tank and pumps into a corner

of the existing screen building and erect an internal wall

4 men x 12 hours/day x 14 days

672 \$18,144.00

Miscellaneous steel, pipe and hardware

\$4,000.00

Crane rental for 7 days @ \$60/hr

\$5,040.00

\$27,184.00

6. Purchase and install electrical space heating for under the thickener

and for the thickener overflow tank enclosure.

1 man x 12 hours/day x 5 days

60 \$1,620.00

Purchase of 6 heaters + cable @ \$500 per heater

\$3,000.00

\$0.00

\$4,620.00

Installation of Piping and Pumps

7. Thickener Underflow Pumps

Overhaul and install two 10 x 8 SRL pumps as thickener underflow pumps

2 men x 12 hours/day x 8 days (4 days per pump)

192 \$5,184.00

Replacement suction and discharge liners, impellor and bearings (\$3,000 per pump)

\$6,000.00 \$0.00 \$11,184.00

Assume pumps, motors and motor control centres are available from TRP but require rebuild

Assume one pump running, one on standby

Install one pump on existing base and connect up existing feed pipes

Install second pump on existing base.

Fabricate and install second discharge nozzle (10" diameter) in thickener U/F cone

1 man x 12 hours/day x 2 days

24 \$648.00

Miscellaneous 10" diameter pipe and flanges

\$2,000.00 \$0.00 \$2,648.00

Install feed piping for second 8 x 10 pump

2 men x 12 hours/day x 3 days

72 \$1,944.00

Miscellaneous pipe, fittings and hardware

\$3,000.00 \$0.00 \$4,944.00

- require one 45 degree elbow and one 10" diameter knife gate valve

\$2,500.00 \$2,500.00

Install discharge piping from both pumps - 8" HDPE

2 men x 12 hours/day x 3 days

72 \$1,944.00

Miscellaneous pipe, fittings and hardware

\$2,000.00 \$0.00 \$3,944.00

- require fabrication or purchase of one 8" x 8" x 8" flanged pipe wye

1 man x 12 hours/day x 3 days

36 \$972.00

Miscellaneous pipe, flanges and hardware

\$1,500.00 \$0.00 \$2,472.00

8. Thickener Overflow Pumps

Overhaul and install two GIW pumps on thickener overflow tank

Assume pumps, motors and motor control centres are available from TRP but require rebuild

Assume one pump running, one on standby

Install one pump on existing base and connect up existing feed pipes

2 men x 12 hours/day x 8 days (4 days per pump)

192 \$5,184.00

Replacement suction and discharge liners, impellor and bearings (\$3,000 per pump)

\$6,000.00 \$0.00 \$11,184.00

Form and pour second pump base

1 man x 12 hours/day x 2 days

24 \$648.00

2 cubic yards of concrete + Lumber

\$600.00 \$0.00 \$1,248.00

Install pump on second pump base

Install 6" diameter feed lines to O/F pumps - length 10 foot each pump

- require two 6" knife gate valves

1 man x 12 hours/day x 2 days

24 \$648.00

2 valves c/w actuators @ \$1,500 each

\$3,000.00 \$0.00 \$3,648.00

Heat trace and insulate 30 foot of overflow piping between thickener O/F
launder and overflow punpbox.

1 man x 12 hours day x 1 days

12 \$324.00

30' of heat tracing & insulation @ \$15/ft

\$450.00 \$0.00 \$774.00

9. Thickener Cone Drain Line - 10" Diameter

Recondition existing thickener underflow drain line. The piping and isolation valve are
all in place. The couplings will have to be cleaned and reassembled.

1 man x 12 hours/day x 1 day

12 \$324.00

Miscellaneous hardware & couplings

\$200.00 \$0.00 \$524.00

10. Thickener U/F line to Northwest Tailings Pond - 8" HDPE

Purchase and install 5400' of 8" HDPE pipe all welded construction between the TRP Thickener
U/F pump and the Northwest tailings pond. An additional 3600' of existing 8" HDPE line
will have to be tied in to permit spigotting along Dam #21 A, B, C & D and dam #22 A & B.

3 men x 12 hours/day x 8 days

288 \$7,776.00

5,400 feet of 8" HDPE pipe @ \$12/ft

\$64,800.00 \$0.00 \$72,576.00

11. Thickener U/F Line to South Pond - 8" HDPE

Purchase and install 4800' of 8" HDPE pipe all welded construction between the TRP Thickener
underflow pumps and Dam #11 at the South Tailings Pond.

3 men x 12 hours/day x 6 days

216 \$5,832.00

4,800 feet of 8" HDPE pipe @ \$12/ft

\$57,600.00 \$0.00 \$63,432.00

12. Thickener Overflow Line to Mill Water Tank and U/G Mine - 6" Insulated heat traced HDPE
Purchase and install 4500' of 6" diameter heat traced and insulated HDPE pipe between
the TRP thickener overflow pumps and the mill.

3 men x 12 hours/day x 6 days

4,500 feet of 6" HDPE heat traced and insulated pipe @ \$15/ft

| | | | | |
|-----|------------|-------------|--------|-------------|
| 216 | \$5,832.00 | \$67,500.00 | \$0.00 | \$73,332.00 |
|-----|------------|-------------|--------|-------------|

Reagent Systems

SO2 System

1. Low Pressure SO2 Air Compressor/Blower

Purchase and install Stainless steel Liquid Ring Air compressor

2 men x 12 hours/day x 4 days

New Stainless steel liquid ring air compressor

- require 50 Hp electric motor and motor control centre

2 men x 12 hours/day x 1 day to install and wire motor and MCC

New 50 Hp motor and MCC

- require cartridge dust filter ahead of compressor

2 men x 12 hours/day x 1 day

Purchase of filter element

Purchase and install insulated steel frame building to house SO2 Compressor

- approximate size 10' x 20' x 10' high with double wide doors

4 men x 12 hours/day x 8 days

Purchase of steel frame building + cladding (\$50/sq ft)

- require concrete footing and gravel floor

2 men x 12 hours/day x 2 days

2.5 cubic yards of concrete @ \$200/yd3 + \$200 of lumber

- require electric space heating

1 man x 12 hours/day x 1 day

purchase of 2 space heaters + power supply cable

2. Piping (Stainless Steel or Fibreglass Reinforced Plastic) - 8" Diameter

Compressor Intake - Between stack flue liquid ring air compressor

- require one 8" diameter stainless knife gate valve

1 man x 12 hours/day x 1 day

Purchase of valve & Hardware

- approximately 100 feet of 8" SS or FRP pipe

2 men x 12 hours/day x 2 days

Stainless steel 8" pipe and mounting hardware (100 ft @ \$20/ft)

Compressor Discharge - Between liquid ring air compressor and reaction tank #1 & 2

- require approximately 200 feet of 8" SS pipe

2 men x 12 hours/day x 4 days

Stainless steel 8" pipe and mounting hardware (200 ft @ \$20/ft)

- require 60 feet of 4" SS pipe for in tank spargers

2 men x 12 hours/day x 1.5 days

Stainless steel 4" pipe and mounting hardware (60 ft @ \$10/ft)

- require two 4" SS knife gate valves, one 8" x 4" x 4" SS wye.

| | | | | |
|-----|-------------|-------------|--------|-------------|
| 96 | \$2,592.00 | \$50,000.00 | \$0.00 | \$52,592.00 |
| 24 | \$648.00 | \$14,000.00 | \$0.00 | \$14,648.00 |
| 24 | \$648.00 | \$3,500.00 | \$0.00 | \$4,148.00 |
| 384 | \$10,368.00 | \$10,000.00 | \$0.00 | \$20,368.00 |
| 48 | \$1,296.00 | \$700.00 | \$0.00 | \$1,996.00 |
| 12 | \$324.00 | \$1,000.00 | \$0.00 | \$1,324.00 |
| 12 | \$324.00 | \$2,500.00 | \$0.00 | \$2,824.00 |
| 48 | \$1,296.00 | \$2,500.00 | \$0.00 | \$3,796.00 |
| 96 | \$2,592.00 | \$5,000.00 | \$0.00 | \$7,592.00 |
| 36 | \$972.00 | \$600.00 | \$0.00 | \$1,572.00 |
| | | \$2,500.00 | | \$2,500.00 |

Lime System

1. Lime Storage Silo, Slaker and Mix Tank

Clean lime out of the TRP plant lime silo

| | | | | |
|----|------------|------------|--------|------------|
| 96 | \$2,592.00 | \$1,000.00 | \$0.00 | \$3,592.00 |
|----|------------|------------|--------|------------|

Miscellaneous hardware, lumber and welding supplies

Disassemble and reassemble TRP Lime Storage silo c/w slaker and mix tank
at the mill

6 men x 12 hours/day x 21 days

New gaskets, bolts, hardware and welding supplies

Rental of boom truck for 21 days @ \$60/hr + scaffolding & air compressor

Overhaul and install Lime Distribution pump

1 man x 12 hours/day x 2 days

Impellor, bearings and mounting hardware

| | | | | |
|------|-------------|------------|-------------|-------------|
| 1512 | \$40,824.00 | \$7,500.00 | \$15,120.00 | \$63,444.00 |
| 24 | \$648.00 | \$1,500.00 | \$0.00 | \$2,148.00 |

Install line distribution loop with takeoffs to #1 and 2 tanks and to pumpbox at the discharge of # 3 reaction tank

| | | | | | |
|--|-----|------------|------------|--------|------------|
| - require approximately 600' of 2" diameter pipe | 168 | \$4,536.00 | | | |
| 2 men x 12 hours/day x 7 days | | | | | |
| 600' of 2" pipe, couplings and mounting hardware | | | \$3,000.00 | \$0.00 | \$7,536.00 |
| - require 3 x 2" red jacket valves c/w solenoid actuators | 12 | \$324.00 | | | |
| 1 man x 12 hours/day x 1 day | | | \$500.00 | \$0.00 | \$824.00 |
| Red Jacket valves, solenoids and mounting hardware | | | | | |
| - require approximately 100 feet of 1" diameter pipe to supply compressed air to the lime control valves | 24 | \$648.00 | | | |
| 1 man x 12 hours/day x 2 days | | | \$500.00 | \$0.00 | \$1,148.00 |
| 100' of 1" pipe, couplings and mounting hardware | | | | | |
| Install electric space heater in bottom of lime silo | 12 | \$324.00 | | | |
| 1 man x 12 hours/day x 1 day | | | \$500.00 | \$0.00 | \$824.00 |
| 1 space heater and power supply cable | | | | | |

Ferric Sulphate System

1. Storage Tanks

Purchase and install two liquid ferric sulphate storage tanks on gravel pads. The storage tanks would be identical in sizing to those at the present ETP

| | | | | | |
|---|-----|------------|-------------|------------|-------------|
| 4 men x 12 hours/day x 4 days | 192 | \$5,184.00 | | | |
| Purchase of two storage tanks | | | \$50,000.00 | | |
| Crane Rental for two days @ \$60/hr | | | | \$1,440.00 | \$56,624.00 |
| - require feed line to each tank | 24 | \$648.00 | | | |
| 1 man x 12 hours/day x 2 days | | | \$1,000.00 | \$0.00 | \$1,648.00 |
| Stainless steel pipe, fittings, valves and mounting hardware | | | | | |
| - require catchbasin around storage tanks (place inside bermed area for the reaction tanks) | | | | | |

2. Metering Pumps and Loop

Purchase and install two LMI metering pumps

| | | | | | |
|--|----|------------|------------|--------|------------|
| 1 man x 12 hours/day x 1 day | 12 | \$324.00 | | | |
| Purchase of 2 pumps @ \$2,000 each | | | \$4,000.00 | \$0.00 | \$4,324.00 |
| Install ferric sulphate distribution loop | | | | | |
| - require 500' of 1" diameter SS pipe | 96 | \$2,592.00 | | | |
| 2 men x 12 hours/day x 4 days | | | \$4,000.00 | \$0.00 | \$6,592.00 |
| Stainless steel pipe, fittings, valves and mounting hardware | | | | | |

Copper Sulphate System

1. Storage and Mix Tank

Move two 2000 gallon plastic tanks

| | | | | | |
|---|-----|------------|------------|--------|------------|
| 2 men x 12 hours/day x 7 days | 168 | \$4,536.00 | | | |
| Lumber for access deck and stairway | | | \$3,000.00 | \$0.00 | \$7,536.00 |
| Overhaul and install agitator in each tank | 48 | \$1,296.00 | | | |
| 2 men x 12 hours/day x 2 days | | | \$1,000.00 | \$0.00 | \$2,296.00 |
| Miscellaneous repair parts, ie. bearings, impeller, etc. | | | | | |
| Purchase and install transfer pump | 24 | \$648.00 | | | |
| 2 men x 12 hours/day x 1 day | | | \$2,500.00 | \$0.00 | \$3,148.00 |
| Purchase of pump & motor | | | | | |
| Purchase and install 1 tonne overhead hoist to move CuSO4 bags | 48 | \$1,296.00 | | | |
| 2 men x 12 hours/day x 2 days | | | \$4,000.00 | \$0.00 | \$5,296.00 |
| Purchase of hoist @ \$3,000 + overhead monorail and support steel | | | | | |

2. Metering Pumps and Loop

Purchase and install two LMI metering pumps

1 man x 12 hours/day x 1 day

Purchase of 2 pumps @ \$2,000 each

Install copper sulphate distribution loop

- require 500' of 1" diameter SS pipe

2 men x 12 hours/day x 4 days

Stainless steel pipe, fittings, valves and mounting hardware

| | | | | |
|----|------------|------------|--------|------------|
| 12 | \$324.00 | \$4,000.00 | \$0.00 | \$4,324.00 |
| 96 | \$2,592.00 | \$4,000.00 | \$0.00 | \$6,592.00 |

Electrical Power

High Voltage

1. Relocate one Transformer from TRP to Mill Substation

- require line work to separate the two transformers at the TRP substation

2 men x 12 hours/day x 4 days

Cable - high voltage

- require concrete pad for transformer

2 men x 12 hours/day x 1 day

7.4 cubic yards of concrete @ \$200/yd3

- require new pole and cable to feed high voltage side of transformer

2 men x 12 hours/day x 1.5 days

Power pole & high voltage cable

Rental of auger & boom truck for 1 day

- require new pole and cable to transfer 575 V power to mill switchroom

2 men x 12 hours/day x 1.5 days

Power pole & high voltage cable

Rental of auger & boom truck for 1 day

2. Relocate power Distribution rack from TRP to mill to distribute new 575V power

2 men x 12 hours/day x 3 days

Electrical cable & hardware

Rental of Boom truck for 1 day

3. Installation of new motor control centres (moved from TRP)

- require approximately 750 Hp of 575 V power

2 men x 12 hours/day x 5 days

Electrical cable & hardware

| | | | | |
|-----|------------|------------|----------|------------|
| 96 | \$2,592.00 | \$2,000.00 | \$0.00 | \$4,592.00 |
| 24 | \$648.00 | \$1,481.48 | \$0.00 | \$2,129.48 |
| 36 | \$972.00 | \$2,500.00 | \$720.00 | \$4,192.00 |
| 36 | \$972.00 | \$2,500.00 | \$720.00 | \$4,192.00 |
| 72 | \$1,944.00 | \$1,000.00 | \$720.00 | \$3,664.00 |
| 120 | \$3,240.00 | \$5,000.00 | \$0.00 | \$8,240.00 |

SUB-TOTAL \$1,632,072.48

Allowance for Freight

10 Truckloads

\$50,000.00

Allowance for Engineering

\$50,000.00

TOTAL \$1,732,072.48

Contingency Allowance

30%

\$519,621.74

TOTAL \$2,251,694.23