BENCH TESTING PROGRAM REDUCES PROJECT COSTS & RISKS

BROWNFIELDS TO GOLD MINES
PRESENTATION OVERVIEW

• Site Overview
• Water Treatment Plant Overview
• Bench Testing Program
• Results
• Full Scale
• Conclusion

Photo Credit: M Turner
SITE DESCRIPTION

Camp

September 2012

Photo Credit: Chris McCue
SITE LOCATION

Photo Credit: Hugo Chartier
MINE CAMP

Kitchen

Sewage Treatment

Bunkhouse

Geo office/ Core shack

Photo Credit: Hugo Chartier
• Water pumped from blasting face and sumps
• Diverted to main sump
• Pumped from main sump to WTP
• Treated in WTP
• Discharged to creek
PARAMETERS OF CONCERN

- Total Suspended Solids
  - Total Metals
    - Dissolved Metals: Aluminum and Iron
      - Nitrogen: Ammonia, Nitrite and Nitrate
        - Sulfate
HISTORICAL WATER QUALITY
WATER TREATMENT PLANT OVERVIEW
BENCH TESTING PROGRAM

FLOCCULANTS
- Increase the size of suspended particles in the water column
- Enhanced settling
- Remove charged particles that remain in suspension

COAGULANTS
- Aid to break colloidal suspension and emulsion
DECISION CRITERIA

• Ability to remove Total Suspended Solids and Total Metals
• Toxicity of the chemical to receiving environment
• Type and amount of equipment required for administering and dosing the chemicals
• Ease of use
DECISION CRITERIA

- Availability of the chemicals
- Ease of transportation and on site storage
- Concentration and total volume required
- Cost
BENCH TEST APPROACH

PROGRAM ONE
84 TESTS
8 BULK WATER SAMPLES
24 CHEMICAL PRODUCTS

PROGRAM TWO
120 TESTS
8 BULK WATER SAMPLES
3 NEW CHEMICAL PRODUCTS
BENCH TEST METHOD

- Test mix techniques and times
- Test varying water turbidity over fixed dosage
BENCH TEST METHOD

- Test dosages over fixed water
- Test durability of flocculent
PERFORMANCE CRITERIA

1. Time of reaction  
2. Size of floc  
3. Settling time  
4. Clarity

Raw Water Sample  Chemical A
Raw Water Sample

Chemical B
FLOC FORMATION

Goop

Pin Floc

Good sized Floc
SYSTEM OPERATION ISSUES

• Large swings in inlet turbidity
• Floating floc in clarifier
• Sludge quality
• Changes in water chemistry
OTHER TESTS

FREE AND TOTAL DRAINAGE TESTS
OTHER TESTS

DRILL MUD

DRILL GREASE

DRILL WASH
CONCLUSION

REDUCED COSTS

• Optimize chemical program
• Optimize plant operation
• Increase plant reliability
• Reduce mining downtime

REDUCED RISKS

• Met performance treatment objectives by reducing TSS and total metals by up to 99%
• Performed effectively under a variety of inlet conditions
• Met site constraints
  - Ease of transport
  - Ease of use (Health & Safety)
  - Low toxicity to the environment
THANK YOU FOR LISTENING!

QUESTIONS?
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