Leviathan Mine
December 2012
TAC Meeting
Lahontan Water Board
Leviathan Mine 1950's
Pond 1
Pond 3
Pond 2S
Pond 2N
Tunnel #5
(the Adit)
Pond 4
Pit Underdrain

Tasks in 2012:
• Summer Pond Water Treatment
• Flow and Stage Monitoring
• Routine Maintenance
• Non-Routine Maintenance
• Approximately 1,000 tons of sludge were hauled off site for disposal in late June.
• Sludge generated during the treatment of 9.8 million gallons of AMD in 2011.
• Pit Clarifier sand layer replenished following sludge disposal in 2012
• Assembly of pond water treatment plant
• Discharge of treated AMD to the Pit Clarifier began on July 9, 2012
• Discharge of treated AMD to Leviathan Creek began on July 12, 2012
2012 Summer Pond Water Treatment

- 2.8 million gallons of AMD treated and discharged
- Influent pH range 2.16 – 2.46 SU
- Influent average TDS 7,500 mg/L
- Field and lab data show all USEPA discharge criteria met except total recoverable selenium

- 62.09 tons lime (dry weight)
- 2,349 gallons diesel
- 312 gallons gasoline
- 290 pounds of flocculent
- 5,235 mg lime / liter AMD
Sludge generated is contained in the pit clarifier.

~ 240 – 300 tons of sludge generated during the 2012 season will be hauled off site for disposal in 2013.
Maximum capacity is available for AMD storage entering the 2012/13 winter season

Ponds 2 North and 2 South at the end of the 2012 treatment season
Flow and stage monitoring

- 18 locations during the 2012 water year
- CUD, Pond 4, and the Aspen Seep removed due to Health and Safety concerns
- 15 locations during the 2013 water year
2012 Routine Maintenance

• Removed accumulated sediment from storm water conveyance ditches
• Repaired perimeter fence
• Sprayed to eradicate invasive Tall Whitetop

Non-routine maintenance by Hannah Schembri
2012 Non-routine Maintenance

Non-routine Maintenance

- Upper Tributary Channel clean-out
- Pond 1 Sludge Removal
- Pond 3 inlet/outlet maintenance
- Pond Liner Leak Detection Survey
- Pond Liner Repairs
Upper Tributary Maintenance

- Removed accumulated sediment/debri from Upper Tributary conveyance channel
Pond 1 Sludge Removal

- Removed approx. 1660 tons of material from Pond 1
- Used long-arm tracked excavator and skid steer
Pond 1 after Sludge Removal
Pond 3 Inlet, Outlet, and Boot Repairs

- Replaced all boots and exposed piping on the inlets and outlet in Pond 3
Pond 3 Inlet, Outlet, and Boot Repairs

- Pond 2 inlet prior to repairs
• Enhanced stability of piping with stainless steel tie down on Pond 2 inlet
Leak Location Survey

- Conducted leak location survey on Pond 1, Pond 2 North and South, and Pond 3
- Used equipment to create a voltage potential throughout the earth cover material in survey area to detect anomalies
• Double Dipole used for Leak Location Survey
• Isolation trenches surrounding the area to be surveyed (Pond 3)
• Calibration process required a certain moisture content for pond liner cover material
• Located two holes – one wooden grading stake in Pond 2 South, and one two inch hole in Pond 1 that was created during sludge removal activities
Repairs were made using a PPL-36 patch material with Pangofol cement.
Air Lance non-destructive testing per ASTM D4437 was used to test each repair made on the pond liner geomembrane.
Questions?