Jerritt Canyon TSF 1

TSF 1 Operational History and Closure Case Study

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“K.I.S.S” is an acronym for "Keep it simple, stupid" as a design principle noted by the U.S. Navy in 1960. The KISS principle states that most systems work best if they are kept simple rather than made complicated; therefore simplicity should be a key goal in design and unnecessary complexity should be avoided.
Dave Bentel’s tailings design, operation, and closure philosophy:

“It’s about the water, stupid"
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Site Location
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Jerritt Canyon Mining and Milling History

• Mining and milling began in 1980
• Carbonaceous gold ore
• 15 open pits and 6 underground mines
• Wet mill and chlorination circuit
• Dry mill, roaster, and CIL circuit
• Tailings slurry disposal
Mill Layout
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Jerritt Canyon Mining and Milling History

- Subaqueous and subaerial tailings slurry disposal

- TSF 1 operated 1980 – 2013, 2017

- TSF 2 operated 2013 - Present
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**TSF 1 Design & Construction History:**

- 360-acre ring-dike tailings storage facility
- Constructed in seven phases between 1980 and 1998
- Built over compacted native soils
- No synthetic lined containment
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1985
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**TSF 1 Seepage:**
- Vadose zone seepage discovered in 1981
- High chloride (>5,000 mg/L)
- High total dissolved solids (>10,000 mg/L)
- Minimal reuse of supernatant and seepage
- Surplus supernatant
- Accelerated seepage into vadose zone
## Jerritt Canyon Mine TSF 1

### TSF 1 Operational History and Closure Case Study

#### TSF 1 Supernatant Volumes (2002 – 2008)

<table>
<thead>
<tr>
<th>Year</th>
<th>Supernatant volume (million gallons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>&gt;800</td>
</tr>
<tr>
<td>2003</td>
<td>668</td>
</tr>
<tr>
<td>2004</td>
<td>672</td>
</tr>
<tr>
<td>2005</td>
<td>694</td>
</tr>
<tr>
<td>2006</td>
<td>583</td>
</tr>
<tr>
<td>2007</td>
<td>469</td>
</tr>
<tr>
<td>2008</td>
<td>507</td>
</tr>
</tbody>
</table>
TSF 1 Surplus Water Management:

- Forced air evaporator units deployed
- Irrigation sprinkler system installed
- 486 million-gallon Evaporation Pond construction (2006-2007)
- 390 million-gallon Water Storage Reservoir (WSR) construction (2011)
- TSF 2 construction (2012)
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TSF 1 Seepage Remediation System

- First pumpback wells installed in 1985
- Additional recharge and monitor wells installed
- Current TSF 1 Seepage Remediation System
  - 90 pumpback collection wells
  - 14 fresh water recharge wells
  - >80 down-gradient monitor wells and piezometers
Jerritt Canyon Mine TSF 1
Final Plan for Permanent Closure (FPPC):

- Interim working platform (IWP) layer of soil/rock to provide access to tailings surface (2’ min thickness)
- Geomembrane liner to cover IWP (40-mil HDPE)
- Final growth media layer (3’ minimum thickness)
- Each cover layer graded to drain towards armored spillway excavated through south embankment
- Stormwater routed though spillway and into the diversion channel on the south side of TSF 1
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2016

Interior Contour Berm Construction
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QUESTIONS??