

December 2008 Update

## Gilt Edge Mine

Operable Unit 2 and 3  
Lawrence County, South Dakota  
(Five-Year Review April 10, 2007)

### *H*ighlights Since the 2007 Five-Year Review

- Analytes measured in effluent as of August 2008.
- Ammonia performance standards have changed and will be reported in weekly and monthly reports as of August 2008.
- Ruby Cap leakage study leads to grout injections in bedrock fractures. Work to begin June 2009

**Brief Site History:** Mining activities began at the site in 1876 when the Gilt Edge and Dakota Maid claims were staked. Historical underground mining extracted sulfide-bearing gold ores from irregular deposits in veins and fracture zones in the igneous rocks. The area was mined intermittently until 1941 and continuously from 1986 through 1998 when the operator, Brohm Mining Company (BMC), announced it would abandon the site. BMC's parent company, Dakota Mining Corp., filed for bankruptcy in 1999 and the State of South Dakota assumed responsibility for water treatment at the site. In 2000, the State sought National Priority List (NPL) listing and that same year the EPA Region 8 Emergency Response Program assumed responsibility for water treatment.

Wastes associated with mining included waste rock, tailing and spent ores contaminated with a wide array of metals. Some of the original contamination sources were removed from the site prior to EPA's involvement.

The contamination of primary concern under OU2 and OU3 is Acid Rock Drainage (ARD). The potential impact of the metal content of the mine waste through direct exposure to human and environmental receptors is being assessed under OU1 and currently is incomplete.

**Cleanup Activities:** The Gilt Edge Mine site is divided into three Operable Units (OUs): OU1, OU2, and OU3. In 2001, after receiving public input, EPA developed cleanup plans for OU2 and OU3. Cleanup plans for OU1 were presented to the public for comment in a Proposed Plan for cleanup in 2008. The Record of Decision was signed in September 2008.

- OU1 addresses the surface contamination for the entire 258 acres of the Gilt Edge Mine site.
- OU2 includes the management and treatment of ARD that threatens surface water in the area.
- OU3 addresses ARD coming from the Ruby Gulch Waste Rock Repository which is the largest acid rock drainage source on the Gilt Edge Mine site.

**Current Status:** EPA Region 8 conducted the first five-year review of the remedial actions implemented at Operable Units (OU) Nos. 2 and 3 on April 10, 2007. The remedy for OU1 has not been selected. A Site Inspection was performed on August 30, 2006. At the time of the inspection it appeared that all physical remediation elements had been constructed.

In OU2 the water treatment plant was observed to be operational and in good condition. The ARD seep collection system in Hoodoo Gulch consists of a French drain constructed across the drainage with an adjacent lift station ultimately delivering water to the treatment facility. The ARD seep collection system upstream of Pond C reportedly was constructed in accordance with the design documents and contains a concrete head structure constructed in an unlined channel directing flow into a pipe; a conveyance of ARD to Pond C via the pipe; and a discharge of ARD from Pond C to a smaller diameter pipe.

In OU3 the Ruby Repository reportedly was constructed as designed with the exception of clean water diversion ditches, which reportedly are leaky due to a damaged liner system, unlined ditches constructed in fractured bedrock, and top soil erosion causing water to flow under liners. However, visual evidence of such damage was not apparent, nor is it expected to be. The vegetative cover was observed to be in good condition with no obvious damage of the liner. The lift station below the collection pond was not operating at the time of the inspection but reportedly is in working order.

**Summary of Protectiveness:** The Remedial Action Objectives (RAOs) are being met under the Interim RODs for OU2 and OU3. Residual risks associated with remaining contaminated environmental media will be addressed under RODs for OU1 and OU-2. Environmental issues to be resolved in these future decision include on-site mine waste, Strawberry Creek, groundwater and long-term water treatment.

**Issues Impacting Protectiveness:** There is no other information that calls into question the protectiveness of the remedy.

**Gilt Edge Mine**

**Five-Year Review Update Table**

**(Review Date 4/10/2007)**

<b>Issues</b>	<b>Recommendations /Follow-Up Actions</b>	<b>Follow-Up Actions (Status/ Due Date)</b>	<b>Status of Follow-Up Action 12/08</b>	<b>Responsible Party</b>
<b>1) Occasional exceedence of applicable State Surface Water Quality Standards (OU2) including temperature, total suspended solids and nitrate.</b>	Continue monitoring	NA	Ongoing	EPA
<b>2) Alkalinity, weak acid dissociable cyanide, total cyanide, chromium VI and dissolved mercury not measured in water treatment facility effluent during most or all the monitoring period.</b>	Improve monitoring program	September 2007	Complete 9/2008. Analytes now measured in effluent.	EPA
<b>3) Detection limit for weak acid dissociable (WAD) cyanide is twice the water quality standard</b>	Revise analytical detection limits.	September 2007	The Practical Quantification Limit (PQL) of WAD cyanide analysis, 0.010 mg/l, is twice the chronic water quality standard. No analytical technic for site water is available that provides a lower detection limit.	EPA

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<p><b>4) New effluent standard for ammonia. The standard is calculated using equations in Appendix A referenced in § 74:51:01:49.</b></p>	<p>Revise performance standards</p>	<p>September 2007</p>	<p>Complete 9/08. Performance standards for ammonia have changed and will be reported on all subsequent weekly and monthly reports.</p>	<p>EPA</p>
<p><b>5) Clean water diversion ditches may discharge to waste rock mass due to suspected leaky channel liner, unlined fractured bedrock ditches and sediment dams in the ditches.</b></p>	<p>Consider repair to suspected leaking channels</p>	<p>September 2008</p>	<p>A study to evaluate the amount of leakage in Ruby Cap diversions was completed. Grout will be injected into the bedrock fractures to reduce leakage. Work to begin 6/09.</p>	<p>EPA</p>
<p><b>6) ROD required site-specific toxicology study of sulfate Total Dissolved Solids (TDS) has not been performed.</b></p>	<p>Conduct study</p>	<p>September 2008</p>	<p>It was decided not to perform toxicity studies for sulfate and TDS since the State water quality program would not consider this information in setting stream standards for these parameters.</p>	<p>EPA</p>