United States Environmental Protection Agency
Region IV
POLLUTION REPORT

Date: Monday, August 3, 2009
From: Leo Francendese

Subject: Barite Hill Nevada Goldfields
McCormick, SC
Latitude: 33.8711000
Longitude: -82.2972000

POLREP No.:	20	**Site #:**	A4NZ
Reporting Period:		**D.O. #:**	
Start Date:	10/15/2007	**Response Authority:**	CERCLA
Mob Date:	10/15/2007	**Response Type:**	Time-Critical
Demob Date:	11/3/2008	**NPL Status:**	Non NPL
Completion Date:	11/3/2008	**Incident Category:**	Removal Action
CERCLIS ID #:		**Contract #**	
RCRIS ID #:			

Site Description

The Barite Hill/Nevada Goldfields site is located approximately 3 miles south of McCormick, South Carolina between US 378 and US 221 on the northern side of Road 30 in McCormick County, South Carolina. The mine site is relatively remote; there are no buildings, homes, or commercial buildings within 0.5 miles of the boundary. The site actively mined gold from 1991 to 1995. From 1995 until Nevada Goldfields filed for Chapter 7 Bankruptcy in 1999, the reclamation of the site was being addressed by Nevada Goldfields. On July 7, 1999 Nevada Goldfields handed the facility's keys to SCDHEC and abandoned the site.

The site is located along a topographic high ridge area forming the headwaters of an unnamed tributary to Hawes Creek. The topography of the area consists of rolling hills with ridgelines at an elevation of about 500 feet. Within the site, the ridgeline comprising the site has a high point of about 510 feet and an average elevation of approximately 480 feet.

The permitted mine site totals 795.2 acres. Of this total, 659.7 acres are designated as buffer area (areas not disturbed beyond the pre-mine natural state); therefore the maximum disturbance area is 135.5 acres.

The facility used a cyanide solution in a heap leach process to extract gold from ore. There are 7 processing ponds and 1 sediment pond onsite. Three large, multi-acre waste rock piles exist in varying condition. Each waste rock pile has the potential for producing acid. Storm water run on and runoff are not controlled at the site. The Main Pit ("Acid Pit") from the mining operations remains. The 10 acre Acid Pit contains approximately 60,000,000 gallons of water with an average pH of 2 ~ 2.2 and a high dissolved metal content. Seeps from the Acid Pit containing acidic water with high dissolved metal content are being released to the northern unnamed tributaries of Hawes Creek which borders the pit at a rate of approximately 5 gpm.

As per a referral by the State of South Carolina, the EPA Region 4 Removal Program conducted a Removal Site Evaluation (RSE) according to the National Contingency Plan (NCP). During the RSE of March 2007, the OSC conducted an emergency response whose scope included the demolition of a furnace building and onsite neutralization of over 2000 lbs of varying strength acids and bases. As of 9/19/07, the Agency has approved an Action Memorandum to conduct a removal action. The removal action commenced on 10/15/07 and includes a Bureau of Reclamation designed cap for the 250,000 CYS of acid producing waste rock adjacent to the Acid Pit, Acid Pit neutralization and cyanide deactivation in one of the onsite process ponds.

The project is expected to take about 12 to 16 months to complete and is projected to cost approximately 4,000,000 dollars. Details concerning this action can be found in both the documents section and Pollution Reports (POLREPS) which are updated on a periodic basis.

Current Activities

On Monday, 6/29/09, OTIE START and Alexco were tasked with correcting the pH of 0.75 meters of the surface of the main pit lake at the Barite Hills removal project.

This 0.75 meters of water (2.46 feet) on the main pit lake had a pH of 3.23 which was well below the 5.27 pH (average pH for the rest of the lake at all other depths).

Alexco and OTIE START formulated the construction of a 50% sodium hydroxide delivery system that would inject a stream of sodium hydroxide combined with the outflow of a six inch trash pump at a depth of about one foot to eighteen inches below the surface of the lake.

On July 1, 2009 construction of the system was began. A 4,000 gallon capacity holding tank for the sodium hydroxide was placed on the hill located to the North of the waste rock cap. This was connected through a system of chemically resistant hoses to a valve and meter system contained in a seven foot by four foot portable building connected to the sodium hydroxide storage tank. The hose was then run to a six inch trash pump, located directly below the hill, near the water surface on the cap. The hose was connected to the discharge side of the six inch pump, which was circulating lake water, and sodium hydroxide was gravity fed to the outlet stream of the pump at approximately three gallons per minute. The system was then operated (with the water discharge of approximately 1,500 gallons per minute) with the sodium hydroxide feed for approximately 54 hours. It was calculated that this should bring the surface water to a pH of 5.0 after the water has had a week or two to stabilize following the sodium hydroxide amendment. pH measurements at the pump and across the lake at the spillway, were 5.0 and 4.8 respectively, after sodium hydroxide injection took place.

Two additional treatments of sodium hydroxide totaling 8,000 gallons were added to the main pit lake during the week of July 20th, 2009. A total of 12,000 gallons of 50% sodium hydroxide was injected into the main pit lake. Following the sodium hydroxide amendment injections pH measurement on the surface water of the main pit lake was 8.72.

Planned Removal Actions

Reseeding of the cap areas will occur in the Fall.

Next Steps

- The current real-time monitoring system for the pit lake has been taken offline and replaced by monthly sampling events. The pit lake retains an average pH of 5.5 with negative ORP approaching 200. Both are indications of successful ongoing treatment.
- A long term monitoring system is being coordinated with the remedial program to replace the prior system. The design presentation occurred on October 2nd in Atlanta. The Barite Removal Project Team was present as well as the RPM, Removal/Remedial Program Management, and the design contractor. Additional funding will be added by the removal program to the pool of available funds for long term monitoring. Final working designs have been submitted for comment and review among the coordinating parties.
- As per the Action Memo, the Removal Program Project Team will continue to provide 2 years of O&M in coordination with SCDHEC.

Key Issues

- The Barite Hill Pit Lake has demonstrated a 79 to 88 % cost savings as compared to traditional acid mine pit closures. Mass balance calculations of pit lake acid producing vs pit lake acid neutralizing potential demonstrate long term sustainability. A summary of the removal remedy, including these calculations and supporting analytical evidence is being compiled. A final draft of these findings are attached. Innovative and Low Cost Remedy at the Bartie Hill Pit Lake (Final Draft)

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