

CATARACT CREEK WATERSHED
Includes the
Redwing and Waldy Sites

Date: December 6, 2007

Status of Site: Reclamation completed.

Site Background: The area reviewed lies within Cataract Creek and one of its major tributaries - Big Limber Gulch. Cataract Creek was ranked 13th on the USGS Priority Watershed list for Montana and is contained within the Boulder River watershed, the #1 priority watershed for AML remediation in Montana. This priority was determined by calculating metals loading from water quality data. The principal source of water pollution in Cataract Creek is the Crystal Mine. The Town of Basin (Operable Unit 1 (OU1)) and the associated Basin and Cataract Creeks, as well as part of the Upper Boulder River watershed (OU2) are currently part of the Basin Mining Area Superfund Site administered by the EPA. Numerous stream reaches within the Boulder River watershed are not meeting their beneficial uses due to impacts from abandoned mines. Aquatic life and fisheries are impaired, recreation and drinking water are also impacted. There is significant risk to human health and the environment in close proximity to numerous sites within this watershed.

Cataract Creek is part of the Basin-Cataract Mining District of Jefferson County. The Cretaceous Boulder Batholith underlies the area and mineralization is associated with east-trending quartz veins. The veins were mined principally for base metals (pyrite, galena, tetrahedrite, sphalerite, arsenopyrite, chalcopyrite and siderite), although economic values of gold and silver were also extracted. Lode mine records from 1902 to 1957 in this district indicate that 129,040 ounces of gold, 5,603,300 ounces of silver, and 4,237,522 pounds of copper, 35,293,697 pounds of lead and 27,301,179 pounds of zinc were produced. Revenue generated from these resources is reported to be \$11,700,309. Small placer deposits were also worked, but there are no production records from these deposits.

Highly variable fracture systems probably control the hydrology in this area. Groundwater movement is most likely similar to mountain drainages, following stream gradients and topography.

The Redwing and Waldy mine sites are located in Big Limber Gulch a tributary of Cataract Creek. Big Limber Gulch and Cataract Creek are predominantly used by wildlife, livestock, and for recreation. One residence is present approximately one mile downstream from the Redwing/Waldy site. Big Limber Gulch is currently not a fishery.

Lead Agency Status: The BLM is the lead agency for the reclamation of the Redwing and Waldy mine sites. The EPA is the lead agency responsible for the Basin Town site and Basin and Cataract Creek Watershed Superfund Sites.

Support Agency Status: BLM is consulting with EPA

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Watershed: Cataract Creek Watershed û tributary of Boulder River HUC #10020006

Includes Big Limber Gulch

Acre In Watershed: 2,500 acres

Miles of Stream in Watershed: 5 miles

Miles of Stream on BLM lands: < 0.4 miles

AMLIS #: Redwing/Waldy MT000700015

Mantle MT000700021

Minneapolis Mine MT000700022

Pipeline MT000700023

Reclamation Status: Active. A final Engineering Analysis and Cost Analysis (EE/CA) has been written for the Redwing and Waldy Mine Sites and the reclamation alternative selected. The Mantle mine site is in the EPA's Watershed OU2. Status of this reclamation has yet to be determined. A contractor has been hired and is proceeding with the reclamation currently. Alternative 5B removal of 6100cy of mine waste to the High Ore Creek repository and site reclamation was the selected alternative currently being implemented.

Total Sites Reviewed: 9 sites

Review Status: Review of this watershed is 100% complete.

Sites Identified With Water Quality Issues and Ownership: 3 sites

Redwing (BLM, Big Limber Gulch), Waldy (BLM, Big Limber Gulch) and Mantle (Private land with surrounding BLM)

Ownership: Mix of BLM and Private

The EPA and USFS and State of Montana have initiated AML clean-up work in Cataract Gulch.

Sites Identified with Safety Hazard Issues: 2 sites

Powerline Prospect Pit (BLM); Minneapolis Placer and Prospect adit (BLM)

Location: Jefferson County, Montana Big Limber Gulch, Tributary to Cataract Creek, Tributary to the Boulder River.

Latitude/Longitude: 44 22° 00" / 112 14&° 00";

PRP Information: Complete

Existing Studies: Montana Bureau of Mines and Geology Open File Report:

Abandoned/Inactive Mines of Montana, U.S. Bureau of Land Management; Abandoned Hard book Mine Priority Sites (Pioneer Technical, 1995), Abandoned Hardrock Mine Priority Sites (Pioneer Technical, 1995) and BLM, Redwing/Waldy EE/CA.

Site Water Quality Issues:

The Redwing Mine consists of two collapsed adits and a mineralized waste rock dump. The dump is located adjacent to Big Limber Gulch and devoid of vegetation. Seepage from one adit flows over and into the dump before entering the creek. The Redwing Mine disturbances cover approximately 0.5 acres. Northeast of the main Redwing is another collapsed adit and associated dump.

The Waldy Mine consists of one collapsed adit and an associated dump. Big Limber Gulch bisects the south toe of the dump. The Waldy mine disturbs approximately 0.53 acre. A second collapsed adit and dump are located northwest of the Waldy. This mine disturbs an additional 0.41 acres.

A total of 6,100 cubic yards of material (3,760 cubic yards of waste rock and 2,340 cubic yards of contaminated soil) are contained in all of the disturbances. Flow from two seeps ranges from 0.2 to 5 gpm. Water in the creek below the mines exceeds the water quality standards for iron and manganese. Additionally, samples indicate that the creek contains elevated levels of cadmium, zinc and lead, although water quality standards are not exceeded for these metals. Samples of material waste and soil collected by the MBMG exceed phytotoxic levels of As, Zn, and Cu. Sediment samples collected downstream of the site contain increased metals.

Human Health Risk assessments conducted by Pioneer Technical Services, Butte (Pioneer), indicated that:

Pb and As are the Contaminants of Concern (CoC's) that have the potential to harm human health through inhalation or ingestion of dust or soil.

The carcinogenic risk of As is greater than one in a million, which is the EPA departure point for assessing the need for clean up at a site.

Ecological Impact studies conducted by Pioneer indicated that: There are no significant potential impacts for aquatic life impacts due to acute toxicity, therefore aquatic life and downstream fisheries are not impacted.

There is no potential for aquatic life to be impacted by apparent sediment toxicity.

As, Pb and Zn have the potential to adversely impact plant communities.

Therefore, Ecological Impact studies demonstrate that As, Pb and Zn are the only CoC's.

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Mantle Mine: This site is located on private land that is surrounded by BLM. One adit described as being on BLM land was not located. Between 1921 and 1939 the Mantle produced 326 tons of ore containing 489 ounces of gold, 637 ounces of silver, 184 pounds of copper and 4,868 pounds of lead. The site contains two 300 to 400-foot long adits, one 100-foot shaft, and a water-powered gravity mill. A mineralized waste rock dump located in the flood plane of Cataract Creek contains As, Hg, Pb, Cu and Mn elevated to at least 3 times that of background. Because both upstream and downstream water samples are similar, the MBMG thought that exceedances of water quality standards in Cd, Cu, Mn, and Zn were sourced from upstream. This is a reasonable assumption because the Crystal Mine, located in the headwaters of Cataract Creek, is attributed with contributing most of the pollution in the drainage. The Mantle will probably be included in the EPA superfund clean up of the Cataract Creek Watershed (OU2).

Watershed Segments contributing the most pollution: The Crystal Mine is credited with contributing one third of the pollution in Cataract Creek.

Water Quality Impairments (303 d List): Cataract Creek from it's headwaters to the mouth is listed as not meeting beneficial uses of cold water fisheries, aquatic life, and drinking water due in part to abandoned mines.

Costs: Costs for remediation of the Redwing and Waldy mines - Alternative 5B (6,100 cubic yards of waste) is \$240,000. The total project costs are approximately \$340,000.