PROJECT SUMMARY
2002
NEW WORLD MINING DISTRICT
RESPONSE AND RESTORATION PROJECT

Prepared For:

USDA Forest Service
Northern Region
Missoula, Montana

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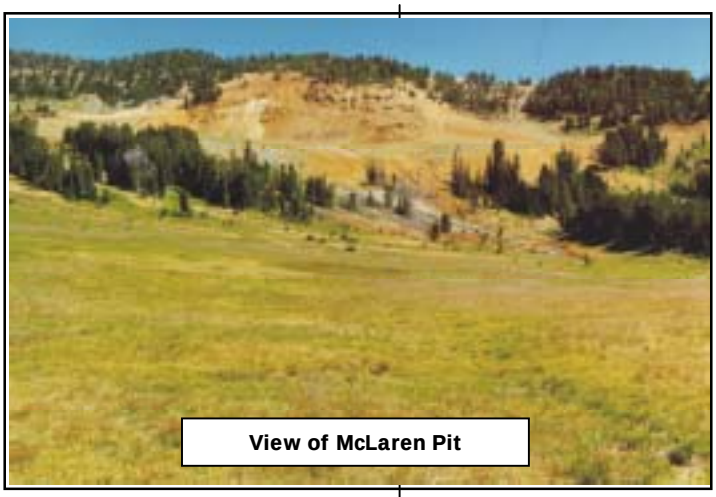
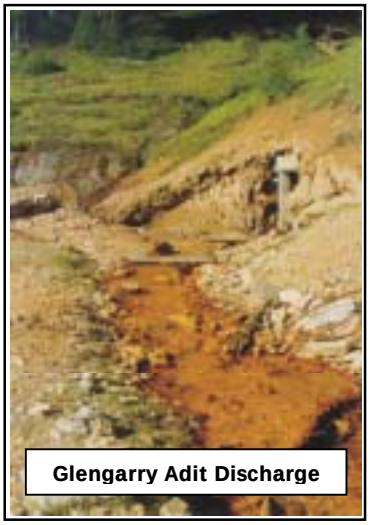


View of McLaren Pit

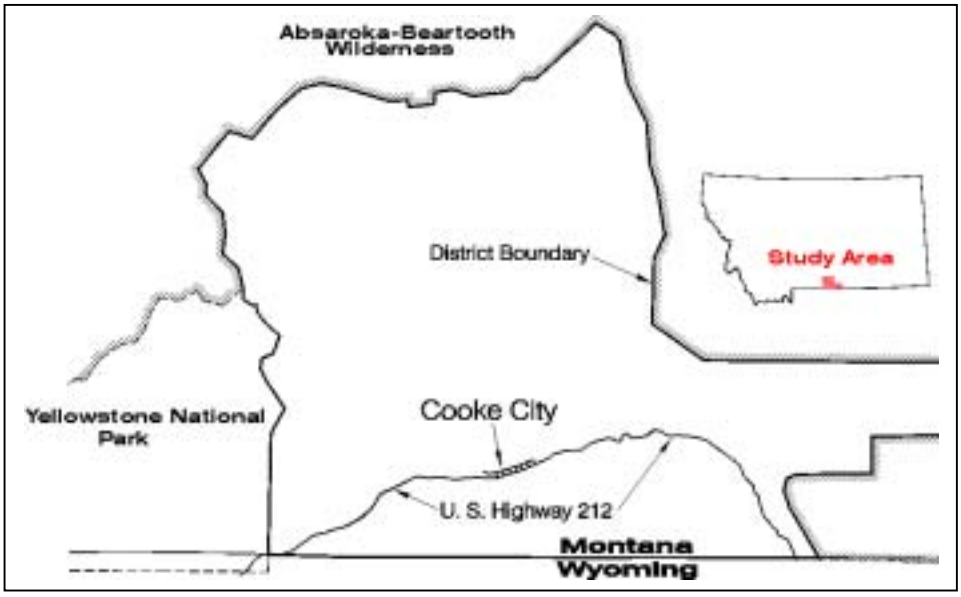
INTRODUCTION

The New World Mining District (District) Response and Restoration Project officially began when the USDA Forest Service submitted an implementation plan to the State of Montana on January 22, 1999. Since that time, the Forest Service has engaged in a number of activities including collecting environmental and engineering data to better understand the site, further investigate portions of the District that were not well understood, and design and construct cleanup actions for the highest priority sites in the District. Since a considerable amount of work has been done since the project was initiated by the USDA Forest Service in 1999, this Project Summary document, which was first distributed in the fall of 2000 and updated again in the fall of 2001, is being updated annually to keep those interested abreast of on-going project activities. Previous Project Summary documents summarized the project's history, mining-related problems, legal considerations, and cleanup process. This Project Summary for 2002 focuses more specifically on the cleanup actions rather than the history and cleanup process.

The District, which includes a mixture of National Forest and private lands, is a historic metals mining area located in the general vicinity of Cooke City, Montana, in the Beartooth Mountains. The figure below and Figure 1 (attached at the back of the summary) shows the project location. The historic mining district is centered northeast of Yellowstone National Park, and contains hard rock mining wastes and acid discharges that impact human health and the environment. Human health and environmental issues are related to elevated levels of heavy metals present in mine waste piles, open pits, acidic water discharging from mine openings, and stream sediments. Cleanup work is challenging in this harsh, mountainous environment due to a severe climate, short construction season, and large amount of snowfall that the District receives.



Glengarry Adit Discharge



Lower Spaulding Dump Before Reclamation

The 40 square mile District is located at an elevation that ranges from 7,900 feet to over 10,400 feet above sea level, and is snow-covered for much of the year. Historic mining disturbances affect about 65 acres with the largest disturbances attributed to the McLaren Pit (12 acres) and the McLaren Tailings (11 acres). The Glengarry Adit and the nearby Como Basin (5.5 acres) are the other major source areas in the District that contribute pollutants to headwater streams.

The District is situated at the headwaters of three river systems that all eventually flow into the Yellowstone River. These rivers include the Clark's Fork of the Yellowstone, the Stillwater, and the Lamar. The Lamar River flows through Yellowstone Park. The major tributary streams affected by mining disturbances within the District include Daisy, Miller, Fisher, and Soda Butte creeks.

Maps of the project site, the previous project summary for 2001, and numerous technical documents concerning the site are available at the project Web site, ***http://www.fs.fed.us/r1/gallatin***, and at information repositories located in Cooke City at the Chamber of Commerce office, in Gardiner at the Forest Service's Gardiner Ranger District office, and in Bozeman at the Gallatin National Forest Supervisor's Office. We encourage you to investigate these information sources to gain a more complete and detailed understanding of the New World Mining District Response and Restoration Project.

CLEANUP APPROACH

Ferricrete Deposits

The USDA Forest Service is the lead agency responsible for implementing the cleanup of mining related impacts in the District. Other state and federal agencies are cooperating with the effort, including the U.S. Department of Interior (DOI), the Environmental Protection Agency (EPA), and the Montana Department of Environmental Quality (DEQ). Numerous interested parties are also actively involved in following project activities and providing comments to the Forest Service. These groups include the Beartooth Alliance, Greater Yellowstone Coalition, Park County Environmental Council, Northern Plains Resource Council, and numerous other concerned citizens and environmental groups.

The USDA Forest Service uses their Superfund authority granted under the Comprehensive Environmental Response, Compensation, and Liability Act (the Superfund enabling law) to proceed with the cleanup. Following EPA guidance, the Forest Service follows the Non-Time-Critical Removal Action process to implement the cleanup.

The overall goal for cleanup is to improve water quality in the District to the highest quality possible, and reduce or eliminate risks to people and the environment from historic mining impacts. The general strategy the USDA

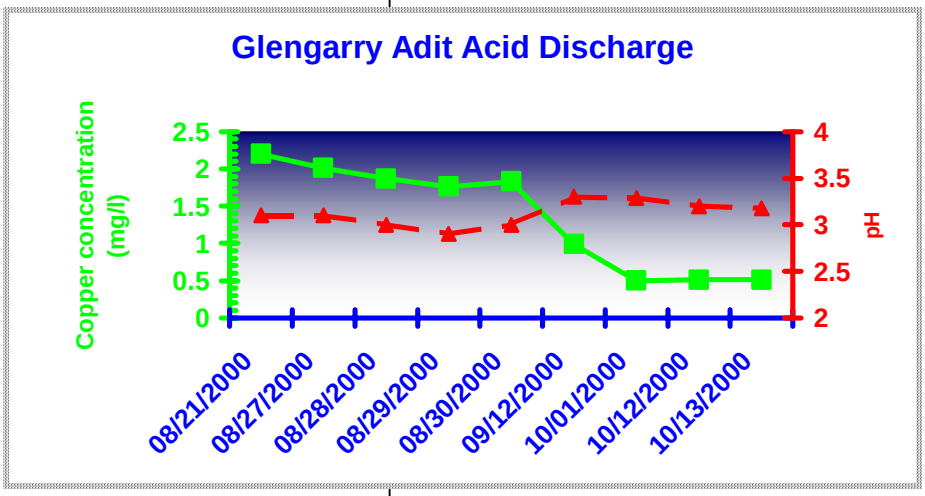
Forest Service is using on this project is to mitigate the readily identifiable solid waste sources as a first phase of cleanup. This is followed by a second phase that addresses problems associated with the more difficult mine discharges.

To support activities that occur each year of the project, the USDA Forest Service prepares annual work plans. These plans were prepared in 1999, 2000, 2001, and 2002. The annual work plans specifically identify the work that is proposed each year. Recognizing that this project also involves restoration, the Forest Service integrates restoration elements within the cleanup process by including restoration in the overall strategy, where possible, for each of the cleanup projects undertaken.

A brief description of the approach used for cleanup is provided below.

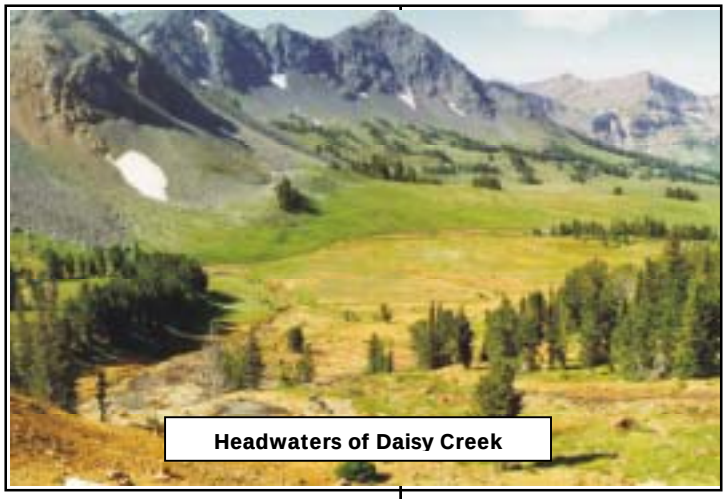
PRIORITIZATION AND EVALUATION OF MINE WASTE SOURCES

One of the key parts of the cleanup evaluation was ranking the mine waste sites in the District using a modified hazard ranking system developed by the Montana DEQ. This system, the Abandoned and Inactive Mine Scoring System, or AIMSS, uses site specific data to evaluate the risk of pollution from mine waste sources via four pathways: groundwater, surface water, direct contact, and air. About 50 site variables, including the results obtained from sampling the waste materials, are input to the scoring system to determine both individual pathway scores and a total score. Higher weights are ascribed to the following: observed releases to groundwater and surface water, especially where an exceedance of a standard is documented; sources that are closer to a population base; and, higher contaminant concentrations, large contaminant quantities, and/or large areas of disturbance. Results of the AIMSS scoring have been presented in numerous project documents including the *Selective Source Response Action Engineering Evaluation/ Cost Analysis*.



Using the goals and objectives outlined in the consent decree, and the results of the AIMSS ranking, higher priority sites are waste sources that are in direct contact with surface water or groundwater, or that have discharges that impact water quality or human health. There are a number of District waste sites that fall into this category, such as the McLaren Pit, McLaren Adit, Como Basin, and Glengarry Adit. Waste sources that are relatively benign will be considered, but it is likely that only minor work would be involved with cleanup of the lowest ranked sites, if at all.

The consent decree and settlement agreement require that funds for this project be first expended on cleanup of mining wastes present on "District Property."



Headwaters of Daisy Creek

District Property is defined in the consent decree as all property or interests in property that the mining company relinquished to the U.S. Government. The McLaren Pit and Glengarry Adit, for example, are District Property. The McLaren Tailings, on the other hand, are non-District Property. Non-District Property cannot be cleaned up until the Notice of District Property Work Completion (Notice) from the federal government and the State of Montana are received. However, the USDA Forest Service has included non-District Property in the assessment phase of the project. The agency cooperators are involved in obtaining additional funding to cleanup non-District Property wastes.

ENGINEERING DESIGN AND CLEANUP CONSTRUCTION

Due primarily to weather limitations, cleanup construction in the District must be done during the short field season from July to mid-October. The USDA Forest Service has elected to address this factor in the process by breaking the cleanup into smaller projects that can be constructed in one to two seasons. To this end, cleanup actions are evaluated each fall/winter/spring in a Superfund document called an *Engineering Evaluation/Cost Analysis* (EE/CA).

Using the AIMSS list as a starting point, source area characteristics are appraised and cleanup alternatives are developed to mitigate site-specific problems. This is described in an EE/CA, and involves taking a comprehensive look at site characteristics and human health and environmental risks, and then follows an established process of screening relevant response options, developing response alternatives, and evaluating alternatives in detail. The detailed analysis of alternatives weighs the expected results of an alternative against seven criteria including overall protection of human health and the environment, compliance with laws and regulations, long- and short-term effectiveness, implementability, cost, and others. After weighing the pros and cons of a number of alternatives, the Forest Service selects a preferred alternative and issues the EE/CA to the public to solicit comments. Significant comments are addressed in a final EE/CA and a decision document, called an Action Memorandum, is issued. Annual EE/CAs were prepared for the project in 1999, 2000, 2001, and 2002.

Glengarry Underground

CLEANUP PROGRESS

In March 1999, the Forest Service initiated the planning process for the project. Planning documents were in place in June 1999, and work began with the monitoring of surface water and groundwater quality at selected monitoring points. A list of activities that have been conducted to date is provided below. Some of these more important activities are described in greater detail following the list of activities.

- Prioritized mine waste sources in the District.
- Established a database management system for the project.

Daisy Pass Road

- Cataloged existing information available for the site and completed a technical evaluation of existing data.
- Developed a suitable basemap to support engineering design.
- Obtained data to fill identified data gaps for proposed response actions at the site.
- Identified unrecorded cultural features.
- Conducted geochemical sampling of mine wastes throughout the District.
- Improved portions of the Daisy Pass and Lulu Pass roads to accommodate construction traffic.
- Improved a previously constructed surface water diversion around the Como Shaft.
- Evaluated areas of erosion contributing excessive sediment to area drainages.
- Completed a repository siting evaluation report and collected hydrogeologic data on two prospective repository sites.
- Completed a U.S. Geological Survey led surface water tracer study on Daisy Creek and Miller Creek to determine surface water inputs of metal contaminants.
- Prepared EE/CAs for the Selective Sources in Fisher Creek, the McLaren Pit, and the Como Basin/Glengarry Adit.
- Cleaned up selective waste dumps and placing wastes in an engineered repository for the Selective Source Response Action.
- Reopened the Glengarry Adit and Como Raise to more fully characterize underground sources of water within the mine.
- Evaluating water quality treatment alternatives for acid mine discharges.

All of the activities listed have been documented in work plans, reports, or technical memorandum and have been issued to DOI, DEQ, EPA, and the public for review and comment.

REPOSITORY STUDY

The identification of a central repository site that could be used to isolate mining wastes that could not be reclaimed *in-situ* was determined to be a priority by the project team. The initial (Phase I) repository siting evaluation examined locations able to contain a minimum of 500,000 cubic yards of waste material, or approximately 810,000 tons.

Phase 1 was conducted in March through July 1999, and used existing technical information available from previous investigations to identify sites with physical and environmental characteristics that would be suitable for disposal of mining wastes. The data evaluated included groundwater, surface water, geology, soil, geotechnical, vegetation, and other environmental information. Phase II was conducted from July 1999 through September 2000, and involved collecting site-specific data at the highest ranked sites determined in the Phase I evaluation.

The SB-4B(B) Repository Under Construction

The SB-4B site, which is located east of the Lulu Pass Road about 0.5 miles north of Highway 212, ranked the highest of the 28 sites evaluated. Evaluation criteria included: location of major faults; geologic setting; steepness of slopes; avalanche potential; precipitation and snowfall; and, access using existing roads. One of the key characteristics of the SB-4B site is the presence of glacial till, which is preferred to bedrock or alluvium because of its lower permeability and because it can be salvaged and used in repository construction. The amount of fine-grained material in the till results in relatively low horizontal and vertical hydraulic conductivity, two characteristics important in limiting the movement of leachate that could potentially migrate below a repository facility.

RESPONSE ACTION CLEANUP PROJECTS

To support cleanup construction, the Forest Service initiated a road improvement project in 1999 to enhance the two major roads in the District. Improvements to the Daisy Pass and Lulu Pass roads primarily involved regrading the road surface, improving drainage, and bringing in gravel surfacing to cover numerous soft spots in the road. In 2000, major road improvements were completed with the construction of two bridges on the Lulu Pass Road. The first bridge replaces the existing low water crossing of Fisher Creek. The second spans Polar Star Creek, a tributary to Fisher Creek just below the Glengarry Dump.

A detailed description of the Response Actions completed, ongoing, or planned for future years are described below.

SELECTIVE SOURCE RESPONSE ACTION

Using the AIMSS list as a starting point, source area characteristics were appraised and an initial cleanup project was proposed in 1999. The first draft of the Selective Source Response Action EE/CA, which targeted removal of nine waste dumps impacting surface water in the Fisher Creek headwaters, was written, and the preferred alternative (waste removal to the SB-4B repository site) was selected. As a result of public comment, however, the 1999 cleanup work was delayed so that more groundwater quality and flow information could be collected at the repository site.

Following an additional year of collecting data at the SB-4B repository site, the Selective Source Response Action EE/CA was re-released to the public in 2000, and the preferred alternative re-selected. An engineering design package was prepared in the fall of 2000 which detailed reclamation plans for the selected sites, and presented plans and specifications for the construction of a repository with a bottom liner, leachate collection system, and a double-lined capping system.

Removal of Spaulding Dumps

The Selective Source Response Action was initiated in 2001 and will be completed in 2002. This initial cleanup project involved removing approximately 32,000 cubic yards of mine waste rock and mill tailings from nine mine waste areas, disposing of these wastes in the SB-4B repository, and revegetating about 4.6 acres of the former waste areas. The waste sites cleaned up represent about 9% of the total acreage of waste on District Property; the volume of waste permanently disposed represents about 8% of the total volume of waste affecting District Property.

Water quality improvements are expected from this action, although improvements are likely to be gradual from this action alone, and later augmented by additional work that is planned for the Fisher Creek drainage. Water quality will be monitored at select stations downstream of the reclaimed sites to document changes in water quality. The first water samples following waste removals were collected in October 2001 and April 2002 during low flow conditions.

MCLAREN PIT RESPONSE ACTION

Planning and preparation for the McLaren Pit Response Action began in 1999. A considerable amount of environmental and engineering data was needed, and the 2000 field season was the time when most of these data were collected. The USGS, working under a contractual arrangement with the Forest Service, conducted an ionic tracer study of metals loading in Daisy Creek in 2000, and the Forest Service's primary contractor, Maxim Technologies, Inc., collected data in the McLaren Pit that would support the preparation of an EE/CA. Hydrologic and metals loading models were completed with these data, indicating that the McLaren Pit contributed from 20% to 50% of the metals load in Daisy Creek. With the results of these studies substantially complete in the fall of 2000, a draft of the McLaren Pit Response Action EE/CA was prepared and released to the public in May 2001.

Excavation of the McLaren Adit

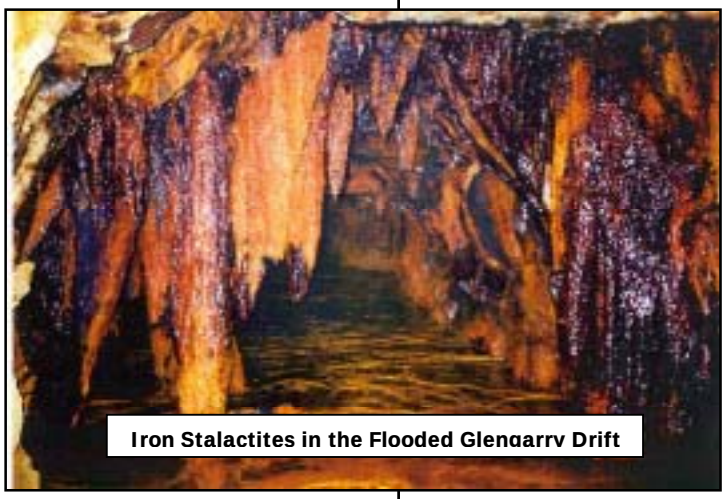
The preferred alternative for the McLaren Pit Response Action is consolidation of waste rock from dumps in the Daisy Creek headwaters into the McLaren Pit, and capping of the consolidated wastes with an impermeable cap. The scope of the McLaren Pit Response Action is limited to reducing or eliminating uncontrolled releases of metals from mine waste material in the Daisy Creek headwaters. By addressing releases from mine wastes in the McLaren Pit and nearby mine dumps, some reduction in contaminant concentrations are expected in surface water, groundwater, and new stream sediment accumulation as a result of removing or controlling these primary sources of mining-related metals in Daisy Creek.

The waste dumps slated for consolidation into the pit are the McLaren Pit spoils (wastes located below the county road and west of the pit) and the multicolor dump. The dumps are all located within the Custer National Forest. Approximately 24,000 cubic yards of waste rock are contained in the dumps, which cover about 3.5 acres of disturbance.

An engineering design and construction package for the McLaren Pit response action was completed in March 2002. The design involves capping about 11 acres of the pit with a geomembrane liner, covering the liner with a drainage layer and soil, and constructing runon and runoff channels to convey water off of the capped wastes. The USDA Forest Service selected a Contractor in May 2002, but due to a protest, the contract was suspended in June 2002. Construction work is expected to be conducted over a two year period.

The scope of this response action does not include directly addressing contaminated groundwater, the McLaren Mine adit discharge, or other sources of potential contamination in the headwaters of Daisy Creek. More comprehensive analysis of response technologies applicable to the McLaren Mine adit discharge will be completed on a District-wide basis in 2003/2004.

COMO BASIN/GLENGARRY ADIT/FISHER CREEK RESPONSE ACTION



Iron Stalactites in the Flooded Glengarry Drift

The Glengarry Mine has been targeted for rehabilitation since the inception of the Response and Restoration Project because it is one of the principal sources of metals loading in the headwaters of Fisher Creek. The mine discharges 23 to 57 gallons per minute (gpm) of low pH, iron-, zinc-, and copper-bearing water directly into Fisher Creek.

The Glengarry Mine consists of 3,060 feet of drifting and two nearly vertical raises. One of the raises extends 425 feet upward and surfaces in the Como Basin at the foot of the north flank of Fisher Mountain. The top of this raise passes through the Meagher Limestone formation, and a massive sulfide ore deposit hosted in the Meagher.

Pony Mining Contractors, under contract to the USDA Forest Service, reopened the Glengarry Tunnel for assessment in September and October 2000. During this phase of reopening and assessment, accumulated debris and ferricrete mud two to five feet deep were removed from the tunnel beginning at the portal and extending back to a "Y" intersection 1,540 feet in from the portal. The two branches of the "Y" were made accessible, but debris and ferricrete were not removed. The Glengarry Tunnel was surveyed and a planimetric map produced.

The following year, in June 2001, the second raise from the surface in the Como Basin was reopened and repaired down to a point well below the base of the Meagher Limestone. Three separate short horizontal workings were encountered

in the Meagher Limestone at 35, 75, and 100 feet below the surface. Each horizontal level and the raise down to 215 feet were surveyed and the geology was mapped. Water inflows were measured and sampled at the collar of the raise and at each horizontal level during July and August 2001. Water was also sampled at the contact of overburden with bedrock (Park Shale) in the exposed wall of the excavation during re-construction of the raise collar.

The Second Raise in the Como Basin

Later in 2001, debris was removed and temporary ladders were installed in the first raise beyond the "Y" intersection in the Glengarry workings. The purpose of this work was to determine whether the top of the raise was open or if it extended beyond the 50 feet shown on the 1930's map. A timber bulkhead was observed at the height shown on the historic map, but removing the bulkheads to determine what was above them or to identify the source of the water inflow was considered too dangerous to workers and the environment to pursue.

A total of five sampling events have been completed in the Glengarry underground that were timed to catch key points of peak and low flow in the hydrograph year. Total flow from the adit ranged from less than 10 gpm to 50 gpm. Water flowing into the Glengarry Mine comes from essentially three point sources and one diffuse source. The point sources are the Como raise, the first raise, and a roof leak at 1,050 feet in from the portal of the adit. Diffuse roof leaks were observed primarily in the first 1,200 feet in porphyritic rock.

Load analysis shows that the vast majority of loading into the adit comes from the raises and the 1050 roof leak, and not the diffuse roof leaks. Comparison of loading sources between elements shows that the Glengarry Tunnel receives several orders of magnitude more copper from the top of the Como raise than from all the other in-flow sources combined. The raises also contribute more manganese load as well. The 1050 roof leak contributes more arsenic, aluminum, and cadmium load than the raises. In addition, the two raises and the 1050 roof leak each contribute at least an order of magnitude more iron loading than do the diffuse roof leaks. Comparison of the percent contribution of inflows, relative to outflow, shows that roughly equal loads of iron, lead, and zinc are released by the raises and the 1050 fracture, varying depending upon flow. These results clearly show that control of discharge from the Como raises and the 1050 fracture are most important in reducing contaminant loading from the Glengarry Adit to Fisher Creek.

A Draft EE/CA was released to the public in June 2002 that evaluates response action alternatives to address mining impacts from the Glengarry Adit, the Como Basin, and remaining mine waste dumps in the Fisher Creek drainage. The EE/CA is structured around each of these three source areas. Response Action alternatives were developed for each of the three source areas to specifically address human health and environmental problems.

Response Action alternatives for the Glengarry Adit include several different options that specifically address each of the four major sources of water in the underground workings. The preferred alternative for this source area involves grouting and backfilling the Como raise, grouting the 1050 roof leak, and partially backfilling the drift. For the Como Basin, alternatives were developed that are similar to those described for the McLaren Pit Response Action EE/CA. These alternatives include total removal of waste to an on-site repository, in-situ treatment, and capping. The preferred alternative for the Como Basin is capping unconsolidated and disturbed materials in the basin with a geomembrane liner. For the mine dumps in upper Fisher Creek, run-on and runoff controls, in-situ treatment, and total removal are being considered. The preferred alternative for this source area is removing the two largest waste rock dumps (the Glengarry and Gold Dust) to the SB-4B(B) repository, and implementing run-on and runoff controls at the remaining dumps that pose potential sediment and erosion issues.

Following input from the public on the preferred alternative, construction cleanup work for the Glengarry/Como Basin/Fisher Creek source areas is expected to begin in 2003 and will likely take two to three years to complete. Work in the Glengarry Adit is expected to be conducted first, with work in the Como Basin and the remaining dumps in Fisher Creek to follow.

MILLER CREEK RESPONSE ACTION

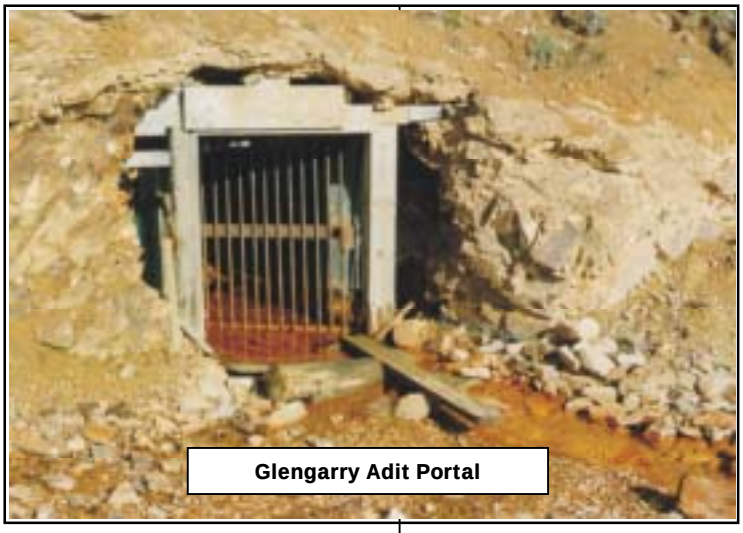
An EE/CA for sources located on District Property in the Miller Creek drainage will be prepared during late 2002/early 2003. This EE/CA will evaluate response options and technologies to mitigate potential impacts from mine waste areas that contribute to surface water quality degradation. The primary sources of information to make this determination are the USGS report on metal concentrations in Miller Creek (USGS, provisional draft, 2001) and the project mine waste ranking system, which lists several waste dumps in the top 20 mine sites in the District.

ADIT DISCHARGE RESPONSE ACTION

Response Actions associated with adit discharges in the District will be evaluated in a separate EE/CA in 2004. There are 10 discharging adits in the District (excluding the Glengarry, which is a separate cleanup action) and the likely response actions that would treat or eliminate these discharges are similar. The EE/CA will address risks to water quality from these discharges, potential treatment scenarios, and resulting load reductions that might be realized

Glengarry Adit Sediment Pond

The Forest Service took an initial look at feasible water quality treatment alternatives, and has identified one potential passive treatment approach that may be applicable to these mine discharge sources. This approach involves building a treatment cell filled with organic and nutrient substrates, burying the cell to eliminate oxygen, and routing mine drainage through the buried cell.



Glengarry Adit Portal

CLEANUP ACTIVITIES PLANNED FOR 2002

To meet project objectives for 2002, the following work has been or will be performed:

- Maintain community relations.
- Maintain project database and Website.
- Prepare a report on the status of temporary water quality standards.
- Continue long-term monitoring of surface water and groundwater.
- Determine the direction for restoration of natural resources damaged by historic mining activities.
- Complete the McLaren Pit groundwater investigation that was initiated in 2001.
- Plug and abandon monitoring wells located in the McLaren Pit.
- Complete investigation of the McLaren Adit (Winter tunnel).
- Complete construction of the Selective Source Response Action.
- Monitor germination success at revegetated dumps reclaimed in 2001.
- Construct the McLaren Pit Response Action.
- Prepare an EE/CA and determine a preferred alternative for the Como Basin/Glengarry Adit/Fisher Creek Response Action.
- Prepare a construction package for the preferred cleanup alternative for the Glengarry Adit/Como Basin/Fisher Creek Response Action.
- Characterize mine waste sources in the vicinity of the Republic Smelter.
- Prepare an EE/CA to evaluate alternatives that would affect clean up actions for sources in the Miller Creek drainage.
- Coordinate with the Gallatin and Custer National Forests on an analysis of roads in the District.
- Prepare 2003 Work Plan.

PROJECT CLOSURE

Long-term monitoring plans were developed to evaluate the beneficial effects of cleanup on surface water quality and effectiveness of revegetation establishment. With these monitoring plans in place, the USDA Forest Service can evaluate the results of the yearly cleanup projects in terms of both water quality and erosion protection, and then assess what additional actions will be necessary as the project proceeds. Once District Property wastes are cleaned up to the extent practicable, the USDA Forest Service will seek a Notice of District Property Work Completion from the U.S. Government and the State of Montana. If cleanup funds remain, remaining funds can be spent on non-District Property wastes.