U.S. Forest Service's

Abandoned Mine Land Program

August 2004

Forty percent of all watersheds within the US contain federal land, and 14 percent of the total runoff in the US comes from National Forest System (NFS) lands. NFS lands are the largest single source of municipal water supply for 3,400 communities in 33 states, serving over 66 million people with drinking water. Watershed protection is one of the principle reasons the National Forest System exists and restoration is one of the primary goals that the Forest Service has established as part of its Strategic Plan. In many watersheds containing NFS lands, abandoned mines need to be cleaned up in order to achieve this goal.

The Forest Service established its combined Environmental Compliance and Protection (ECAP) and Abandoned Mine Lands (AML) programs to reclaim the several thousand abandoned underground and open pit hard rock, placer, and coal mine sites and related mine and mill waste sites on NFS lands that are causing damage to the environment or risks to public health and safety.

reclaimed cyanide heap leach mine site

Because many AML sites involve a combination of federal, state, and private lands, the Forest Service actively seeks partnerships with other agencies, private groups or persons, and companies or owners potentially responsible for the site. This allows the Forest Service to "leverage" its funds to maximize accomplishments and achieve reclamation of all sites in an entire watershed regardless of ownership.

Growth of the Forest Service AML Program:

The Forest Service began receiving funds to clean up abandoned mines and other sites contaminated with hazardous materials following the passage of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA or “Superfund”) in the early 1980’s. Initially this funding was used to clean up Forest Service facilities, landfills, inventory potential CERCLA sites, and reclaim large abandoned sites like the Holden Mine on the Wenatchee National Forest and the Blackbird Mine on the Salmon-Challis National Forest. By the mid 1990s the Forest Service estimated there were about 38,500 abandoned or inactive hardrock mines on or affecting NFS lands. Of this total, about 7,600 (20%) could harm surface resources and an unknown but significant number could harm the public due to the presence of physical hazards (open shafts, adits, etc.).

Initially the AML program relied upon a combination of funds from the Department of Agriculture (USDA) and several Forest Service resource program budget sources, including the minerals and geology, soil, and watershed programs. In the late 1990's under the principle of "primary purpose", Forest Service AML funds were consolidated in the NFVW budget line item and jointly managed by a partnership of the Minerals and Geology, Engineering, and Watershed Programs. In 1998 the Forest Service set aside an additional $5 million for mine site cleanups. These AML funds resulted from an agreement among the Forest Service, Environmental Protection Agency, and the states to focus resources on cleaning up abandoned mines using the watershed ("basin-wide") approach rather than attempting to place each mine site under an individual NPDES water discharge permit.

Program Funding:

Table 1 shows the growth in the Forest Service AML Program funding for the period 1998 to 2006 (2005 and 2006 are projected budget requests and allocations). The funding shown in Table 1 is a combination of funds from the Department of Agriculture (USDA) and the Forest Service. In 2002, AML funds increased significantly from $5 million to about $22 million. Since 2002, program funding has been relatively constant with $6 million to $7 million coming from the USDA, and $15 million coming from Forest Service funds.

FS AML funds *($1,000's)*[1]

	1998	1999	2000	2001	2002	2003	2004	2005[2]	2006[2]
Total Request	$7428	$6013	$6283	$7275	$52011	$46679	$33535	$25000	$34000
Total Funded	$4600	$4743	$5843	$5000	$21750	$21470	$21830	$17200	$20000

This table does not include the significant amount of other state, federal and private funding that is generated through partnerships formed under the Forest Service AML Program. At some hard rock mine sites like the Holden Mine on the Wenatchee NF, the Blackbird on the Salmon-Challis National Forest, and the Phosphate Mines on the Caribou-Targhee National Forest, expenditures by owner/operators of these facilities is in the tens of millions of dollars. At other sites expenditures by the Forest Service are augmented by state and federal agencies and other partners that are spending their funds under participating agreements. The Monday Creek watershed on the Wayne National Forest is a good example of an AML partnership to restore a watershed impacted by coal mining.

Allocation of Funds:

[1] This table only shows Forest Service and USDA funding (with FS AML funds from 1998 through 2001, & FS AML, ECAP, & USDA funds combined 2002 to present). In addition, work over the same period by potentially responsible owners or operators is well over $200 million. There is also a significant amount of work by other state and federal agencies and private partners that occurs on or adjacent to NFS lands as a result of our active program.

[2] Projected budget request and allocation.

The nine Forest Service Regions submit proposals to the Washington Office of specific Regional priority cleanup projects, including the estimated costs and benefits of each project, for competitive consideration against other Regions' AML projects. A team consisting of 6 Forest Service representatives (1 each from the Minerals and Geology, Engineering, and Watershed Staffs and 3 Regional Office AML program leaders) rate each of the submitted projects through a formal "Choosing by Advantages" methodology. Projects are ranked by the team based on how well they meet criteria for human health and safety, environment protection, public/private partnerships and public interest. The Forest Service Washington Office then makes final allocation decisions to specific cleanup projects. The USDA prioritizes projects for its funds using a similar approach.

Although the ECAP/AML Program is one of the few programs funded at the national level, there are good reasons and strong support from the Regions and National Forests for doing so. Many of the projects funded required large investments of funds over a period of many years. The normal budget process does not accommodate such projects. In addition tying funds to specific projects helps ensure that on the ground work is maximized and overhead costs reduced. This project-driven approach results in more effective use of limited funds.

Work Accomplished:

Since 1998 the National Forests have reported that nearly 400 safety hazards have been mitigated and over 150 major CERCLA mine sites (involving hazardous substances) and non-CERCLA (involving sediment) mine sites have been cleaned up.

The abandoned mine cleanup and restoration work that is funded by the Forest Service AML Program falls into 3 general categories:

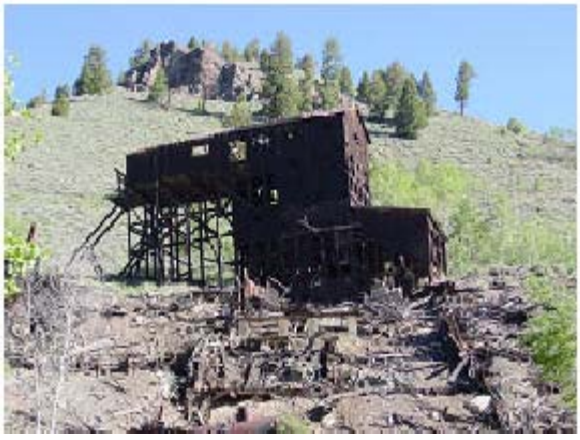
1. Large & Complex Mine and Mill Sites in Heavily Impacted Watersheds

These abandoned or inactive mines typically involve tens to hundreds of acres of disturbance, and often require restoration or removal of mill buildings, roads, mine openings, open pits, waste rock, chemical reagents, tailings and spent ore. Releases of acid waters, hazardous materials, or sediment from these abandoned mines often cause significant effects to surface water, ground water, and aquatic resources, in addition to direct impacts to soil, vegetation and wildlife. Cleanup of these sites may cost $10 million to $100 million and require many years to complete. Frequently work on these sites is done by companies or individuals potentially responsible for the site, under the direction and oversight of the Forest Service and other state or federal agencies. Although relatively few in number, work on these projects has the potential to restore many miles of aquatic resources, often in sensitive or critical habitat, and tens to hundreds of acres of soil and vegetative resources.

2. Drainages Affected By Historic Placer Mining

In many areas of the Western United States, placer mining has disrupted miles of streams and adjacent floodplains. While these disturbed areas may not be releasing hazardous substances, they may be contributing sediment, and in almost all cases they have resulted in losses of aquatic habitat, floodplains, and associated wetlands and riparian areas. Restoration of these areas typically involves design and construction of a natural stream channel and associated floodplain, removal or reshaping and revegetation of placer tailings (rocks and boulders), and reestablishment of wetlands or riparian habitat.

3. Small Mine Cleanups and Safety Hazards



The majority of abandoned coal and hard rock mines consist of isolated mine openings, waste piles, shafts, roads and old structures. Although they may not have the extensive problems that large complex mine sites do, they often pose significant environmental problems for local watersheds and hazards to public safety. Cleanup may involve reshaping the site; closing mine adits and shafts; containing mine wastes in on-site capped and lined repositories; water source control and simple treatment systems (e.g. passive lime); removing mine chemicals and trash; removing or stabilizing old mine buildings for historic interpretation; and preserving habitat where possible for AML-dependent wildlife species such as bats.

Future of the AML Program:

In 1995, USDA and the Forest Service set an AML Program goal: ***To reclaim by the year 2045 all abandoned mine site on National Forest System lands that have the potential to release hazardous substances or sediment.*** The cost of this goal in 1995 was projected at about $4 billion and is likely much higher now. To achieve it would require an average annual budget of $80 million. Although USDA and Forest Service AML funding is far short of $80 million, the Forest Service is striving to meet it and fund the clean ups through working with past owners or operators and expanding partnerships with state, federal, and local agencies, and private individuals and organizations. Future AML budgets are never guaranteed, but the AML program should compete well for funds because of its proven cost-effectiveness, results-based management, and direct link to the Forest Service National Strategic Plan objectives.