

**Arizona State Office**  
**Abandoned Mine Land Work Plan**  
**Period: FY2007 – FY2013**

**Summary**

Significant mining areas in Arizona are:

- Southeastern - Eastern Arizona – Porphyry and vein deposits (copper, silver, molybdenum, gold, tungsten, lead, zinc)
- Central Arizona - Vein and massive sulfide deposits (copper, lead, silver, gold, manganese, tungsten, mercury)
- West-central Arizona – Vein deposits (gold, silver, copper, lead, zinc, manganese, uranium, tungsten)
- Southwestern Arizona – Placer and vein deposits (gold, silver, manganese)
- Northern Arizona – Breccia pipes and stratabound deposits (uranium, vanadium, manganese, copper)

Significant and widespread mining, both on- and off-site beneficiation, and smelting have occurred in Arizona's mining districts since the 1860s. Many of the lands originally mined were patented; however, abandoned mine sites commonly occur on public land near all of the historic mining districts. Numerous industrial mineral sites also occur in Arizona, but these typically are small and pose little risk to people or natural resources.

Arizona currently has an inventory of 1,953 known abandoned hardrock mines on BLM-administered public lands. This inventory includes 38 mines that may impact water resources, and 961 sites that likely pose significant physical safety hazards. Arizona's inventory covers the entire state; however, it currently is a patchwork from data from the U.S. Bureau of Mines MILS system (least accurate), data collected for the Arizona BLM via an assistance agreement with the Office of the Arizona State Mine Inspector (1992 - 1998, moderate accuracy), and from our own field data (most accurate). Only about 20% of BLM administered public lands in Arizona have been covered with moderate accuracy (or better) surveys.

Our inventory efforts in the 1990s were focused near major population centers (Phoenix, Tucson, Kingman, Wickenburg, and Lake Havasu City); so, several million acres of BLM-administered lands in Arizona have not been recently inventoried. Additional AML inventory work is planned which will focus on areas near recreation and high use sites. Arizona intends to expand our inventory through other program work as well. We intend that AML data will be collected as we move forward in our evaluation of rangeland health and monitoring in other resource programs (e.g., range, soil-water-air, riparian, wilderness, National Lands Conservation System (NLCS; monuments), recreation etc.). Our work plan also includes verification of historic inventory data records and close effective management of prospective data.

According to available records, 6 water quality projects and 74 sites with significant physical safety hazards have been remediated since FY1999. However, Arizona began actively cleaning up and closing sites in 1985 with the voluntary help of mining claimants. Additionally, numerous sites

were remediated during the 1990s in concert with the Office of the Arizona State Mine Inspector. As we analyze and verify our data records, we expect to find historic records for dozens of sites that were closed or cleaned up during the 1980s and 1990s. AZ will compile and maintain these historic records as part of our work plan.

BLM Arizona will make every effort to establish partnerships with other stakeholders and foster community and outside agency participation in the remediation of AML hazard sites. We intend to continue a partnership with the Office of the State Mine Inspector and with Bat Conservation International and further develop partnerships with the AZ Department of Environmental Quality, the AZ State Land Department, the AZ Department Water Resources, and multiagency-multipartner watershed groups which have begun work in several areas in the state to improve key watersheds (e.g. Upper Gila and Aqua Fria watersheds).

We've redirected position duties in the AML and hazmat programs in Arizona to be able to respond to AML and hazmat issues and develop necessary partnerships. We've resurrected a state AML team with assigned points of contact for the AML program in each of our 7 Field Offices, and we've assigned first responders for hazmat in each office. Hazmat and AML programs have been braided because many of the AML issues involve hazmat issues and many of the hazmat sites in Arizona are mining related. Additionally, we've transferred the on-the-ground zone duties of the state hazmat / AML program lead to a new zone hazmat-AML position in our Phoenix District. These changes will allow us to accomplish more on-the-ground projects, improve our responsiveness to sensitive issues, and allow us to catch up on lagging strategy and policy development. Most importantly, these changes will allow us to foster new partnerships which will eventually lead to improved public health and safety.

### **AML Watershed Projects**

In Arizona, all the watersheds flow eventually to the lower Colorado River. Virtually all of the municipal and Native American Reservation water systems are fed by free-flowing surface waters or by ground water from recharge areas within the lower Colorado River basin. The arid climate and proximity to the California and Mexico borders heightens the sensitivity of any water related issues, and the weather patterns often create flash flood (flushing) conditions. Consequently, the entire lower Colorado is closely scrutinized by the public, and all the AML sites occur in tributaries to the lower Colorado.

Arizona has consistently identified in the riparian and soil-water-air programs 4 watersheds as our highest priority natural resource watersheds. They are, in priority order, the Upper San Pedro, the Middle and Upper Gila, the Aqua Fria, and the Bill Williams. This priority order was developed in concert with other natural resource agencies and watershed groups. However, additional watersheds with AML sites flow near or through major population centers, encompass the recharge area for groundwater supplies for metropolitan areas, and drain directly into the lower Colorado River. An abandoned mine multiagency-multipartner working group, comparable to the natural resource working groups, has not been convened in Arizona to reach consensus on the highest priority watersheds for protecting public health and safety. Consequently, for this strategy, we identify watersheds and sites in those watersheds that obviously pose the highest risk to public health and safety. Watersheds with sensitive natural resources currently are considered lesser priority than those that pose an immediate risk to people.

Arizona has not yet developed detailed guidance for assessment criteria for prioritization of watersheds, although this was identified in February 1995 as a high priority goal in the Strategic Plan for the Arizona Minerals Program. Development of this guidance is a high priority for FY2006 as an outgrowth of this work plan. Currently in Arizona, the priority of watersheds, and the priority of sites within high priority watersheds, has been based on level of risk of the threat to public health and safety because of proximity and direct flow to, or influence on, human populated areas. Sites with risk to other natural resources have been considered lower priority. As an outgrowth of this work plan, we intend to develop detailed assessment criteria that will score and categorize sites and watersheds. It will include both quantitative and qualitative risk factors for both people and natural resources.

Based on the best, currently available information and for purposes of this strategy, the 6 highest priority watersheds impacted by AML sites on public lands are, in priority order, the Hassayampa, Upper San Pedro, Tyson Wash, Sacramento Wash, Hualapai Wash, and Imperial Reservoir watersheds. All but the Hassayampa and the Upper San Pedro priority watersheds flow directly to the sensitive lower Colorado River. However, the Hassayampa provides water and ground water to the Phoenix basin. The Upper San Pedro supplies water to the Sierra Vista subwatershed with both human and natural resource issues. Also, the Upper San Pedro also is the subject of special Congressional legislation and monitoring. Additionally, 1 project is currently underway in the middle Gila for the benefit of downstream users, including Native American tribes.

There are 19 abandoned mine sites on public lands in Arizona that have impacts on water quality in the 6 high priority watersheds. Table 1 contains a list of planned project areas associated with these 19 mine sites. The impacts include acidic metal laden drainage from mine openings, tailings and waste rock dumps, and mine wastes in stream channels or washes.

As we expand and clean up our inventory, examine and develop our assessment methods, and embrace input from partners, our priority list undoubtedly will expand and have to be adjusted.

**Table 1.**

<b>Priority Watershed Projects</b>							
<b>WATERSHED</b>	<b>PROJECTS FUNDED/ PLANNED</b>	<b># AMM Sites</b>	<b>FY START</b>	<b>FY FINISH</b>	<b>EST TOTAL COST</b>	<b>EST BLM PORTION</b>	<b>KEY PARTNERS</b>
1. Upper San Pedro	San Pedro Mill Sites	4	05	08	\$400,000	\$400,000	*None
2. Upper San Pedro	Charleston Lead Mine	1	09	09	\$200,000	\$200,000	None
3. Hassayampa	Wickenburg Millsite	1	07	09	\$3,330,000	\$3,330,000	None
4. Hassayampa	Octave Tailings	1	10	12	\$240,000	\$240,000	None
5. Sacramento Wash	Mohave Hope Mine & Millsite Antler Mine & Millsite	5	07	09	\$500,000	\$500,000	None
6. Hualapai Wash	American Legion Mine C.O.D. Mine &	5	07	09	\$500,000	\$500,000	None

	Millsite						
7. Tyson Wash	Moon Mountain Millsite	1	07	07	\$500,000	\$500,000	None
8. Imperial Reservoir	Red Cloud Mine Tailings	1	08	09	\$500,000	\$500,000	None

\* We routinely coordinate AML work with the Office of the Arizona State Mine Inspector; however, it is not listed here because it is not currently contributing funding or in-kind funding in the project areas.

### **AML Physical Safety Sites**

Over 150 high-risk mine openings have been identified on BLM managed lands in Arizona. The majority of these features are within the jurisdiction of 4 of our Field Offices. The most significant types of mine hazard features are open shafts, adits, and stopes, such as those near the La Posa Long Term Visitor Area (LTVA), and the Indian Kitchen and Swansea recreation areas. These areas typically have high use for backcountry touring and off highway vehicle (OHV) activities, rock hounding, and recreational mineral collection by winter visitors, or are located near populated areas. Several of the sites afford habitat for wildlife. Approximately \$1,700,000 will be required to remediate these types of mine hazards at the known sites.

Remediation at key sites is guided by focused inventory assessments starting with those sites that are clustered in proximity to sites with high public exposure. Additional inventory work is planned (see Table 3 for workload targets) for areas not included in the existing inventory.

**Table 2.**

<b>Priority Physical Safety Hazard Sites</b>					
<b>RECREATION AND HIGH USE AREAS</b>	<b># OF AMM SITES</b>	<b>FY START</b>	<b>FY FINISH</b>	<b>EST BLM COST</b>	<b>KEY PARTNERS</b>
1. Snyder Hill	12	07	07	\$25,000	*None
2. Indian Kitchen	24	08	09	\$40,000	None
3. Bronkow	15	10	11	\$15,000	None
4. Tombstone	1	10	10	\$5,000	None
5. Saddle Mountain	6	07	09	\$30,000	None
6. Vulture Mountain Race Course	2	08	08	\$10,000	None
7. Harquahala Summit	1	09	09	\$8,000	None
8. Hells Canyon Wilderness	1	10	10	\$5,000	None
9. Union Pass	3	07	09	\$25,000	None

10. Hualapai Mountains	5	07	09	\$40,000	None
11. N. Black Mountains	4	07	09	\$100,000	None
12. Garnet Mountain	6	07	09	\$60,000	None
13. Oatman	5	07	09	\$40,000	None
14. Swansea	28	07	08	\$110,000	Arizona SHIPO, Site Stewards, BCI, AZG&F
15. Laguna Mountains	3	07	07	\$200,000	None
16. Red Cloud Mine area	6	09	10	\$80,000	None
17. La Posa LTVA	17	09	10	\$200,000	None
18. Dome Rock	13	07	07	\$155,000	None
19. Dripping Springs	11	08	09	\$260,000	None
20. Picacho Hills	7	08	08	\$200,000	None
21. Mohawk Mountains	4	08	08	\$80,000	None
22. Islander Mine	2	07	07	\$20,000	BCI, CAF&G, CA Division of Mines
23. Pilot Rock and Standard Wash	4	07	07	\$50,000	AZG&F

\* We routinely coordinate with the Office of the State Mine Inspector for all actions; however, it is not listed here unless it contributes funding or in-kind funding.

**Table 3.**

Workload Targets								
PE	FY07	FY08	FY09	FY10	FY11	FY12	FY13	Total
BH	91	28	25	25	25	25	25	244
HP	44	41	45	18	8	8	7	171
JK	12	23	77	3	0	1	0	116
NP	2	1	2	1	0	0	0	6
NQ	2	1	4	0	0	2	0	9

\* BH=Inventory/Assessment, HP=Physical Hazard, JK=Environmental Hazard, MG=Monitoring, NP=Evaluate Cost Avoidance/Cost Recovery, NQ=Process Hazmat Cost Avoidance/Cost Recovery Cases

For specific details on planned, ongoing and completed projects, go to the BLM Arizona AML web site at <http://www.blm.gov/az/mines/mines.htm>.

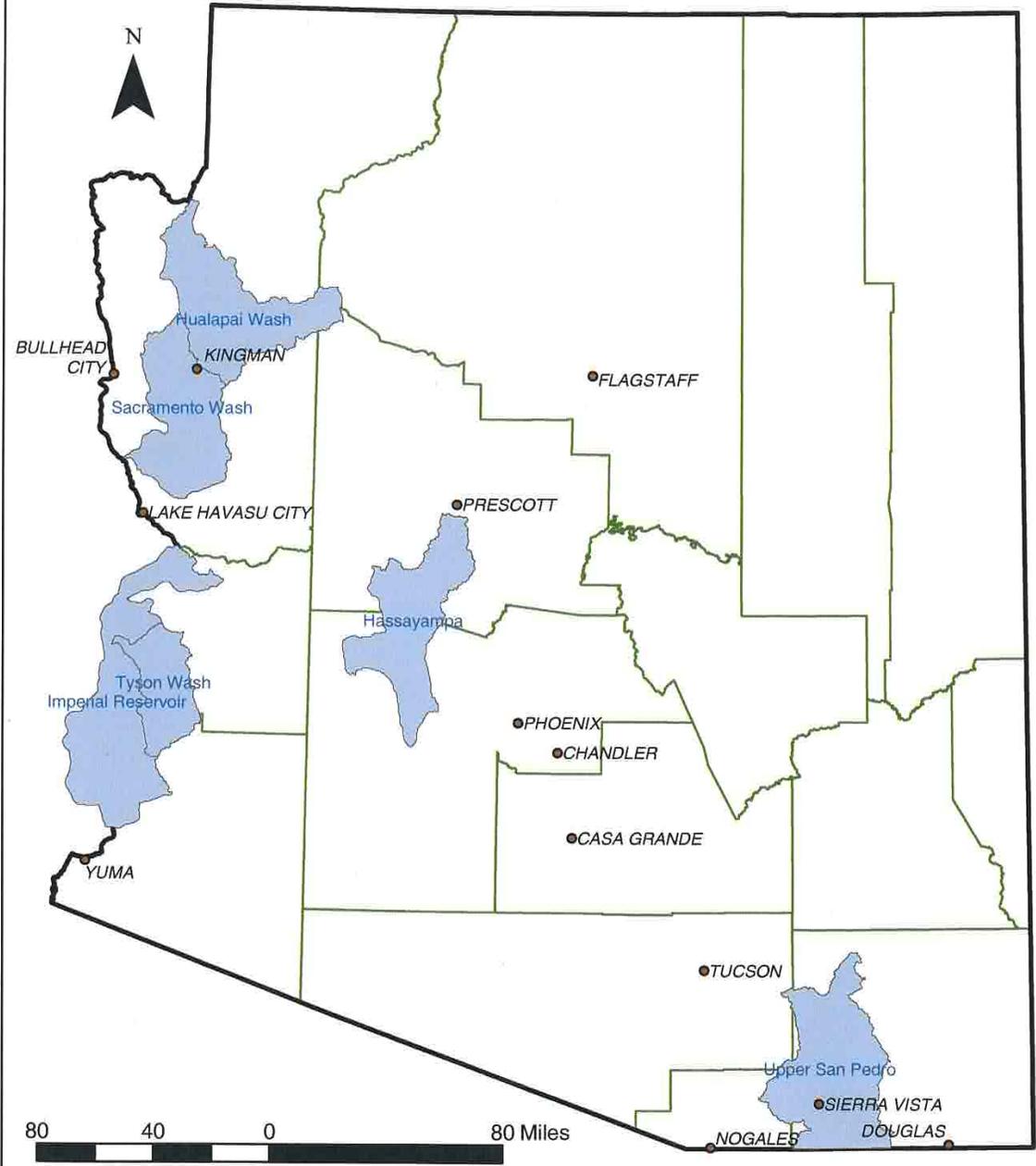
Arizona's ability to accomplish this workload will be based on level of funding. We believe we have made significant progress in the last year in establishing both AML and hazmat teams that are poised to accomplish the work, in raising the awareness internally and externally of the importance of the AML program to public health and safety, and in garnering BLM management support to move forward with this strategy.

**Key AML Contacts**

Al Burch or Hazmat / AML program lead (now being hired)  
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One North Central Avenue, Phoenix, AZ 85004  
(602) 417-9221  
[Al\\_Burch@blm.gov](mailto:Al_Burch@blm.gov)

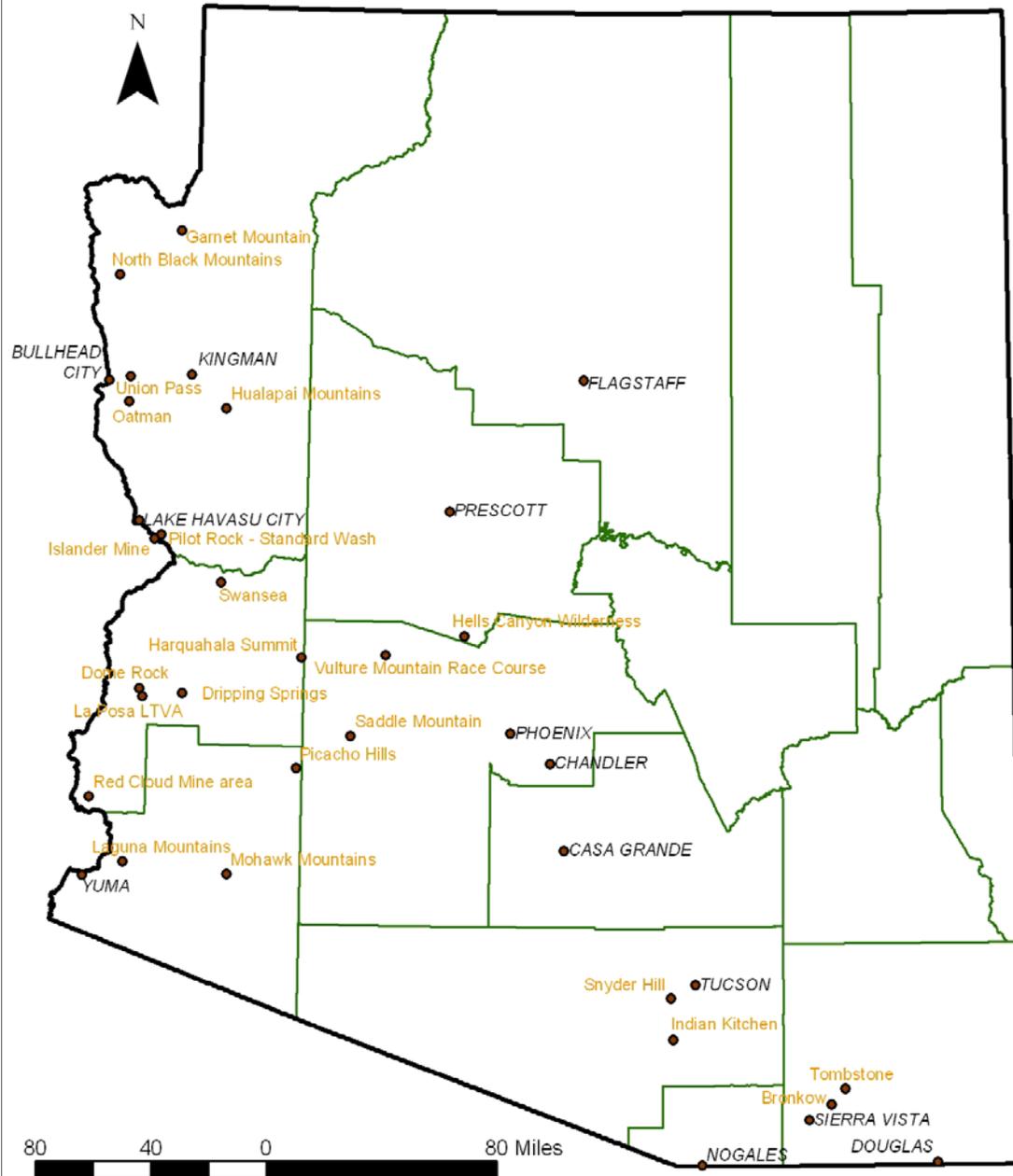
Arizona Strip Field Office - Rody Cox  
Kingman Field Office - Paul Misiaszek  
Colorado River District - Christine Bates, Cathy Wolff-White  
Yuma Field Office - Stephen Fusilier, Gary Rowell  
Phoenix District - Matt Plis, also new Hazmat / AML position now being hired  
Tucson Field Office - Bill Auby  
Safford Field Office - Larry Thrasher

# BLM AZ - Abandoned Mine Lands Program FY2007 - FY2013



## Priority Watersheds

# BLM AZ - Abandoned Mine Lands Program FY2007 - FY2013



## Priority Recreation & High Use Sites