Colorado Abandoned Mine Land Inventory and Information Hub: Report on the Development and Data Sources

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INTRODUCTION

In late-2015, after the Gold King Mine spill, the Water Quality Control Division (WQCD) of Colorado Department of Public Health and Environment (CDPHE) approached the Colorado Geological Survey (CGS) to discuss the creation of a state-wide abandoned mine land (AML) inventory. The CGS had completed an AML field inventory of U.S. Forest Service (USFS) property in the 1990's (CGS, 2018); however, in 2015 there was no known comprehensive inventory of AML features for the entire state. WQCD recognized that a comprehensive statewide inventory would help identify other vulnerable sites and assist in prioritizing remedial activities. It was apparent at the start that the first step was to identify what other inventories might already exist at the time and then determine how those inventories could be combined in an easily accessible format. It was also recognized that this first step might lead to additional data gathering to fill data gaps, as necessary.

Accordingly, the goals of the project were to determine what electronic AML information sources exist (e.g., an inventory of electronic AML inventories) and to develop an accessible AML information hub containing this information. Between 2015 and 2018, the following tasks were completed:

- Identify and document existing AML electronic inventories for hardrock and uranium mines (e.g., the inventory of electronic AML inventories);
- Establish an AML steering committee (AMLSC) with representatives from various agencies to develop the scope and content of an AML information hub;
- Develop an online AML information hub, based on the available electronic AML databases and information provided by other agencies;
- Coordinate integration of the AML information hub with CDPHE's existing Environmental Resource Assessment & Management System (eRAMS) platform developed and maintained by Colorado State University's One Water Solutions Institute;
- Provide public outreach at local watershed conferences and meetings; and
- Complete a report documenting the existing AML databases, AMLSC meetings, and other pertinent information.

During the project, CGS also helped develop the draining mines water quality data set into a usable abandoned mine ArcGIS data layer. In addition, CGS assessed the application of light detection and ranging (LiDAR) technology to mapping AML features in two areas within the Colorado Mineral Belt.

At the request of the WQCD, CGS representatives attended an AML mixed ownership meeting in February 2016 to determine sources of AML information. During this meeting, several agency representatives provided an overview of their AML data. After this meeting, an AML stakeholder engagement meeting was held in April 2016 to establish the AMLSC. The group discussed the AML information hub content, vision, data gaps, pitfalls, data access concerns, and path forward. During this meeting, volunteers were solicited for the AMLSC.

The AMLSC was formed to discuss the purpose and use of an AML information hub, provide a forum for sharing AML information between agencies, and to provide input to the design and content of an online AML information hub. The following agencies are involved or have attended meetings of the AMLSC:

State Agencies

- CDPHE WQCD;
- Colorado Division of Reclamation, Mining and Safety (CDRMS);
- CGS;
- Office of Archaeology and Historical Preservation (OAHP);
- Colorado Division of Homeland Security and Emergency Management (CDHSEM);

Federal Agencies

- Bureau of Land Management (BLM);
- Department of Energy Legacy Management (DOE LM);
- Environmental Protection Agency Region 8 (EPA);
- National Park Service (NPS);
- USFS, Rocky Mountain Region (RMR);
- U.S. Fish and Wildlife (USFW) Service; and
- U.S. Geological Survey (USGS).

The Southern Ute Indian Tribe was contacted about the stakeholder meetings and is included in stakeholder agenda emails. Trout Unlimited and the Coalition of the Upper South Platte were also invited to the 2018 AMLSC meetings.

Mining has been a significant industry in Colorado since the 1800s. Historical mining associated with many of the AML features we see today was generally performed prior to the enactment and implementation of federal/state laws that govern mining and protect human health and the environment. Most of the federal environmental laws that regulate active mines, other industries, and environmental remediation of abandoned sites were implemented in the 1970s and 1980s including: the Safe Drinking Water Act, Toxic Substances Control Act, Surface Mining Control and Reclamation Act (SMCRA), Resource Conservation and Recovery Act (RCRA), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and the Superfund Amendments and Reauthorization Act (SARA).

Colorado state laws associated with mining were developed in the 1960s and 70s including the Open Mining Land Reclamation Act of 1973 which established a permit process and limited bonding for coal mines and other industrial mineral operators. In response to the 1977 SMCRA, the state enacted the Colorado Surface Coal Mining Reclamation Act in 1979 (CSCMRA). Beginning in 1980, the State Mined Land Reclamation Board promulgated rules and regulations for coal mining and reclamation activities (CDRMS, 2016a). In 1976, the Colorado Mined Land Reclamation Division was created under the Department of Natural Resource (DNR) to regulate non-coal mining operations (CDRMS, 2016b). Today, the DNR's Colorado Mined Land Reclamation Board and CDRMS promulgates the State rules and regulations associated with mining, mine safety, and reclamation of abandoned mines (CDRMS, 2016b).

Abandoned mines generally include structures and other mining features (e.g., openings and piles) related to the extraction and beneficiation of minerals that were constructed prior to the enactment of state and federal laws. The Colorado AML mixed ownership group, which includes representatives working on AML from several state and federal agencies, meet and work on prioritizing and remediating AML sites to protect the public and environment. Different organizations may be focused on restoring different types of abandoned mines based on their mission and therefore, definitions of an abandoned mine can vary by agency. A few examples of abandoned mine land definitions are provided in Table 1.

Abandoned mines can pose physical and/or environmental hazards to the public. AML hazards can vary depending on the specific properties of each mine and may include environmental hazards associated with water quality (e.g., drinking water, recreation, and/or wildlife), falling, mine portal collapse, explosives, radioactivity, and asphyxiation. CDRMS records indicate that abandoned mines have claimed 18 lives since 1955. In the State, people and pets are rescued from abandoned mine openings every year (CDRMS, 2016c).

There are several estimates of the number of AML sites and/or features in Colorado. AML sites, or mines, usually contain many mine features (e.g., adits, shafts, etc.). This is further complicated by the fact that some AML estimates may include several different mine types (e.g., hardrock, industrial minerals, coal, etc.) while others may include specific mine types (e.g., hardrock mines). Additionally, AML feature counts are not necessarily an indication of environmental or physical hazards. For example, many of the features included in the AML inventories are prospect pits/holes where prospecting activities left a small depression and a small pile of rock. These features litter the hillsides of some mining districts in Colorado and usually are not significant contributors to environmental or public health issues. Here are a few examples of estimates of AML sites and/or features in Colorado over time:

- In 2000, the CGS reported that there are approximately 18,382 mine features at 2,742 field inventory areas on USFS property in Colorado. Field ratings, based on criteria presented in this report, indicated that 86.2% of these features had no apparent environmental degradation and another 8.8% were rated as having slight environmental degradation (Sares et al., 2000).
- Based on BLMs 1990s inventory and a 2006 report, there are 2,751 known abandoned hardrock mines on BLM land. This inventory included 4,670 features that may impact water resources (e.g., draining adits/shafts, mine waste, and mill tailings) and 10,818 features (open adits/shafts, high walls, collapsing structures) that may pose physical safety hazards. BLM also reports that, on average, they encounter another 30 mine openings each year which are added to their inventory (BLM, 2006)

- In October 2007, the U.S. Government Accountability Office (GAO) estimated that there are 7,300 locatable abandoned hardrock mine sites in Colorado that contain 17,000 features that pose a significant hazard to public health and safety and 150 sites with environmental degradation (GAO, 2008).

- According to CDRMS, approximately 23,000 abandoned mines exist in Colorado (CDRMS, 2016c).

- In 2017, the BLM reported on their website that Colorado has a grand total of 3,576 AML sites and provided the following summary: action completed = 941, final closeout = 1, in progress = 18, maintenance and monitoring = 83, needs analysis = 1,507, no action = 946, planned = 80, and needs addressed (sum of) = 1,688 (BLM, 2017). Their website indicated that the source of this information was BLM's abandoned mine site cleanup module (AMSCM) database from 5 January 2017. Additionally, BLM indicates that one site can contain multiple features and that the inventory data should be: "*considered soft because the BLM is consistently reviewing and updating the AML database.*"

The following sections discuss the inventory of existing electronic AML inventories, other potential sources of mining information, general assessment of data, and the formation of the AMLSC.

Existing Electronic AML Inventories

In October and December 2015, during the initial meetings between the WQCD and CGS, the WQCD determined that the AML inventory should concentrate on abandoned hardrock mines, including uranium, due to their abundance in Colorado and associated risks to the public and environment. Mining activities associated with coal, industrial/non-metallic minerals (e.g., sand, gravel, dimension stone, gypsum, etc.), any material mined under the Materials Act of 1947, oil and gas, oil shale, geothermal/ groundwater extraction and issues associated with mine subsidence were not included in this project. Although the CGS did not request this information, various agencies did include non-hardrock/uranium data in their 2016/2017 electronic data submissions for the AML information hub discussed later in this report. During meetings in 2017, the AMLSC decided to keep these features in the information hub as well as some coal mine databases for reference purposes.

Between late-2015 and early-2016, prior to the formation of the AMLSC, the CGS researched existing electronic sources of AML information and compiled information about these data sources. Several electronic databases and other publications contain information about AML in Colorado as summarized on Figure 1 and Table 2. Existing hardrock and/or uranium AML electronic databases include the following:

- USFS CGS AML database;
- BLM AMSCM database;
- DOE LM Defense Related Uranium Mine (DRUM), previously known as the Abandoned Uranium Mine (AUM), database;
- NPS AML database;
- CDRMS Brass Caps database (reclamation information only);

- EPA Geographical Information System (GIS) data;

- EPA Uranium Location database (ULD):

- OAHP database;

- USGS Digital Data Series (DDS) 73 (Nash, 2002);

- USGS Professional Paper (PP) 1651 mine inventory database (Church et al., 2007); and

- CDPHE/CDRMS Colorado Abandoned Mines Water Quality Study (CDPHE, 2017).

CGS performed a general review of the data fields and database contents as provided through demonstrations and/or other documents. Data field lists and data dictionaries were requested but not available in some cases. Due to the lack of documentation for some of the databases, a general review of data fields was performed using documents published by other organizations. Some data field lists (e.g., for the BLM and CDRMS databases) were extracted from a DOE publication (DOE, 2014). The following subsections briefly describe the sources of AML information listed above.

USFS CGS AML Inventory Database

The CGS completed a field inventory of abandoned and inactive hardrock mines on USFS lands in Colorado between 1991 and 1999 (Table 2). Approximately 18,000 abandoned mine-related features were inventoried. Areas with natural acid rock drainage were also noted on field forms. The USFS CGS inventory process included a desk top data search for existing mining and geologic literature, previous mine inventories, and current/historical maps to compile a map of mines and potential mining features. Aerial photographs (1:24,000-scale) were examined to locate potential mine sites not identified by other sources. Water quality information was used to identify streams potentially affected by acid mine drainage or other mine-site contaminants. When the office research process was complete, geologists visited specific mine locations (Sares et al., 2000). Additional mines not identified in the literature search were found while performing the field inventory work.

Investigated mines were grouped geographically into "inventory areas" that were given identification numbers based on the Universal Transverse Mercator (UTM) coordinate system. An inventory area usually contained one to twenty mine features that could be grouped in

relation to geographic features, such as a gulch or hillside. Mine features inventoried included adits, shafts, prospect pits, high walls, quarries, waste rock dumps, tailings, and spoils. All mine features within an inventory area were numbered sequentially (Sares et al. 2000). Mine locations and data collected by the field geologists were entered on field forms and, subsequently, into a computer database and ArcGIS. An example of the completed field forms is included in Appendix A. Latitude/longitude information for each mine feature and water test were obtained by transferring mine location information from the field maps to Mylar overlays. Mine locations were then digitized from the overlays into ArcGIS (Sares et al., 2000). Reportedly, some of the locations were also collected using a handheld global positioning system (GPS) receiver.

Water quality data, such as pH and conductivity, were collected at all features where water was present, such as draining adits, seepage at the toe of dumps/tailings, and standing water in shafts. Water samples were collected where field tests indicated low pH and/or high conductivity, including several areas with natural acid rock drainage. Samples were analyzed by a laboratory for dissolved/total metals and for selected anions. The quality of water associated with a mine feature was also assessed in the field by determining the pH, specific conductance, and physical observations. Observable characteristics were documented including precipitates and salts in the effluent drainage, opaque or cloudy water, stressed vegetation, and absence of aquatic organisms. This information was used to assign a qualitative "Environmental Degradation Rating" to the individual mine feature. Physical mine hazards were also rated in the field (Sares et al., 2000). The USFS CGS database is in ArcGIS and Microsoft Access format and the data dictionary, and a summary, is included in Appendix B. The physical/environmental hazard rating criteria documentation and maps are also included in Appendix B. The results of this study, including ArcGIS and Google Earth files, are available for download on the CGS website (CGS, 2018).

Bureau of Land Management AMSCM Database

Colorado's BLM program addresses environmental impacts and hazardous mine openings associated with AML (Table 2). It is an on-going process undertaken primarily at the field office level. The AMSCM database is used to support the BLM's AML related programs. AMSCM

stores and reports information about inactive and abandoned mine sites. Under a BLM 1993 directive that was designed to include common data elements/guidelines to ensure that AML was characterized consistently, AML inventories were collected during field inspections. To date, only a small percent of all BLM public lands have been inventoried with these guidelines, and the data quality of the original inventory records varies widely. Therefore, the data contained in AMSCM needs significant "cleanup" and the BLM continues to conduct field inspections at some of the AML sites to improve data quality (BLM, 2007).

Although BLM's AML program focuses on hardrock mine sites affecting watersheds, any type of AML site can be entered into AMSCM. Each record includes a site located on or potentially affecting surfaces managed by the BLM (BLM, 2007). As AML sites are identified, or additional information is obtained regarding sites currently in the database, field staff update the database when time and/or funds allow. A complete inventory record contains the following information:

- Site identification (e.g., site name) and location (e.g., county and state), including accurate GPS measurements;
- Site features (e.g., caved adits, open shafts, and/or tailings) and risks (e.g., physical and environmental);
- Potential hazardous materials;
- Reclamation conditions and status; and
- Project information and status (e.g., projected and actual start and completion dates) (BLM, 2007).

Detailed site maps, sampling, and other technical information (e.g., water quality sampling results) that may not be available in AMSCM, may be available in the BLM main office and/or field office project file records.

During a meeting between BLM and CGS representatives held on 18 March 2016, BLM indicated that the AMSCM database may be upgraded from the current database format (i.e., Informix/Sybase) to a new database platform and potentially ArcGIS. Currently, field offices

perform AML site visits on an as-needed basis. The field personnel fill out a field form, included in Appendix A (BLM, 2008), and this information is entered into AMSCM. Locations of mine features are either recorded with a handheld GPS or on maps and coordinates are determined later. Water chemistry data and field measured flow rates are not entered into AMSCM. This information may be available at the individual field offices.

AMSCM primarily contains abandoned hardrock mine information, some abandoned uranium mines associated with BLM's work with the DOE, and generally does not contain abandoned coal mine information. Although the CGS was not provided with a data dictionary or database field names, BLM representatives indicated that the database field names correspond to their field inspection checklist form. Additionally, the DOE provided the AMSCM database field names in an appendix of their report (DOE, 2014). A summary of the AMSCM field inspection information and database field names as presented in the 2014 DOE report is provided in Appendix B.

DOE DRUM Database

The National Defense Authorization Act for Fiscal Year 2013 mandated that the DOE prepare a report on abandoned uranium mines which included the development of the DRUM database. This Act also required consultation with other relevant federal agencies, affected states and tribes, and the interested public. The database prepared during this assessment is considered a static inventory of sites recognized at the time.

DOE defines an abandoned uranium mine as a feature or complex developed to extract uranium ore for atomic energy defense-related activities of the United States from 1947 to 1970, as verified by purchase of ore by the U.S. Atomic Energy Commission (AEC) or other means. Since the AEC production records formed the basis for the database, defense-related uranium mines are generally associated with a patented or unpatented mining claim or a lease of federal, state, tribal, or private lands. Some mines listed as abandoned may have been reclaimed or remediated. Others have current operating permits, but may have abandoned mine features within the permitted area that have not been remediated. Mines associated

with these categories were included in the set of legacy mines that were considered for evaluation as part of their report (DOE, 2014).

According to the DOE, the AUM database is best described as a collection of data in different formats placed into a single spreadsheet file (Table 2). Due to the differing formats and data conflicts, not all the data were easily placed into defined fields. The DRUM/AUM database was created by using the AEC records which included the mine name, production, and the state and county for location. Additional location information for these mines was selected from the EPA ULD database which provided latitude and longitude of these mines. Reportedly, several checks of the latitude and longitude entries were made during other data reviews from sources provided by other state/federal agencies. If more accurate information was available during these reviews, then the original coordinates were replaced with this information.

The original AEC records contained 4,140 records and the claim names were matched with names provided in other databases to determine location coordinates including the EPA ULD database, the USGS Mineral Resources Data System (MRDS), other EPA data, BLM data, BLM's AMSCM database, CGS data, and other data sources. Data from these other databases were included in the DRUM/AUM database. Several of the original coordinates were incorrect due to unknown coordinate datum, section corner locations, or claim boundary locations. The DOE performed location reconciliation on many of these locations using aerial imagery and topography maps. Limited field verification was completed to verify some locations including in the Tallahassee District in Fremont County, Maybell District in Moffat County, and the Uravan Mineral Belt in Colorado (DOE, 2014).

According to the 2014 DOE report, there are 1,539 uranium mines associated with the AEC in Colorado. Approximately 1,423 of these mines have known longitude/latitude and 116 are only known by county and/or mining districts (DOE, 2014). DOE and BLM formed a partnership in 2016 to verify and validate the condition of defense-related uranium mine sites on BLM managed land in Colorado. The agencies will conduct field investigations at a select number of sites in the summer/fall of 2016. Results of these field-based efforts will be incorporated into the AUM/DRUM database to improve its accuracy (Personal Communication 1, 2016). A

summary of the AUM database field names and a database entity relationship diagram developed for their recent database update was provided by DOE LM and is included in Appendix B. Because the DOE DRUM/AUM database relies heavily on uranium mine locations from the other data sources discussed in this report (e.g., EPA ULD database, etc.), any future queries of this database could likely contain duplicate mine location information.

NPS AML

Mining and other mineral resource development have occurred in many areas throughout the U.S. that are now units of the National Park system. Several earlier efforts were made to document and inventory AML sites by the NPS and the basic structure of the existing database was developed in 2009. The NPS conducted an AML inventory between 2010 through 2013 and is also considered a static database of sites recognized as of 2013. This inventory was completed to provide a comprehensive AML inventory, to categorize the mitigation needs, and to estimate the resources needed to address priority sites (Table 2) (NPS, 2016).

Within the NPS AML database, AML sites were generally defined as areas with distinct past ownership, geographical, or other logical grouping that contain these features. Features included in this AML inventory include facilities, structures, improvements, and disturbances associated with past mineral exploration, extraction, processing, and transportation operations. Vertical shafts, adits, open stopes, open pits, high walls, and prospects; structures such as headframes, mills, wellheads, and storage facilities; landform modifications such as access roads, drainage diversions, and drill pads; and piles of ore, protore, waste rock, soil stockpiles, and hardrock or placer tailings are all examples of AML features included in the NPL AML database. The NPS AML database also includes hazard rating system based on a select set of criteria in order to prioritize AML features for remedial action (NPS, 2016). A data dictionary and the hazard rating system for the NPS AML are included in Appendix B.

CDRMS Brass Caps Database (reclamation only)

According to their website, CDRMS has been safeguarding abandoned/inactive mines since 1980 (CDRMS, 2016d). Within the CDRMS, the Inactive Mine Reclamation Program (IMRP) was established in 1980 to address the hazards and environmental problems arising from

abandoned mines in Colorado. It was instituted under the provisions in the 1977 SMCRA, which gives the states that have approved coal mining regulatory programs under Title V of SMCRA the ability to assume exclusive responsibility and authority to reclaim abandoned mine lands within their borders. Mines abandoned prior to 1977 are eligible for the program. The program was launched with an inventory of an estimated 23,000 abandoned mine sites and physical hazards associated with past mining activities (i.e., open adits/tunnels and high walls), throughout the state. Using this inventory, Colorado prepared a statewide reclamation plan, which was approved by the U.S. Department of the Interior, Office of Surface Mining in June of 1982. As of 2016, approximately 10,058 abandoned mined features have been addressed through this program and 33 underground coal mine fires have been identified and investigated for safeguarding and control.

The IMRP maintains the "Brass Caps" database which contains an inventory of completed AML physical hazard abatements (Table 2). It is updated as projects are implemented. Additionally, the CDRMS supplies the OSMRE with information about coal mines for their database. Although the Brass Caps database is not an inventory of AML sites in the State (e.g., a comprehensive field investigation of AML sites on private and public lands throughout Colorado was never conducted), it contains information about completed and recent (e.g., over the last year) AML projects which focus on physical hazard abatement. Representatives at CDRMS indicated that they have a set of older (e.g., 1980s) hard copy records associated with a Colorado AML inventory. However, the records were never digitized and are not available electronically.

As discussed during a meeting with an IMRP representative held on 12 January 2016, they perform AML site visits on an as-needed basis. The field personnel complete a field form, included in Appendix A, and this information is entered into their Microsoft SQL Server database which is used in conjunction with ArcGIS. Locations of mine features are either recorded with a handheld GPS or on maps and coordinates are determined later. Because the Brass Caps database focuses on physical hazards, other data are not entered into the database which may include water chemistry data and field measured water flow rates.

The CDRMS AML database contains abandoned hardrock mine information and coal mine information. Although the CGS was not provided with a data dictionary or complete list of database field names, a CDRMS representative indicated that the database field names correspond to their inactive mine site field form (Appendix A). Additionally, the DOE provided the database field names in an appendix of a recent report (DOE, 2014). A summary of the CDRMS database field names is provided in Appendix B. It includes a summary of the field inspection field list and the data fields presented in the 2014 DOE report.

EPA GIS Data

The EPA maintains a geodatabase containing mine feature location data from multiple Superfund sites throughout Region 8 (Table 2). According to the EPA, these data are updated on an as-needed basis and are housed in their internal ArcGIS system. These data were acquired from multiple sources, including EPA contractors, at different times.   Data fields include the CERCLA identification number, location, site name, mine name, feature type, elevation, and information sources.

EPA ULD Database

The EPA addresses hazards posed by technologically enhanced naturally occurring radioactive materials (TENORM). In order to identify potential problems associated with uranium mines, the EPA compiled the ULD database, in Microsoft Access and GIS format, that includes uranium mine location information from federal, state and Tribal agencies throughout the western U.S. including Colorado (Table 2). It is a static database as of the time of publication in 2006. Uranium mine records from the USGS were also included. The current number of locations associated with uranium, as identified in the ULD database, is around 15,000. Of these uranium locations, over 4,000 are mines having documented production. The database does not reflect the current reclamation status of the uranium locations (EPA, 2006). Based on a query of the GIS files, over 4,200 of these locations are within Colorado.

The ULD database was created using various sources of information including data from the Colorado BLM abandoned mine land inventory, USGS MRDS, USGS Mineral Availability System / Mineral Industry Location System (MAS/MILS), BLM, and the USFS. The CDRMS Brass Cap

database was evaluated, but was not included due to issues with location data (EPA, 2006). A data dictionary, compiled by the DOE (DOE, 2014), and a database relationship diagram are included in Appendix B. Because the ULD is a compilation of data acquired from existing databases most of which are discussed here, future data queries associated with the ULD may contain duplicate information.

OAHP Database

The National Historic Preservation Act (NHPA) of 1966 authorizes the Secretary of the Interior to expand and maintain a National Register of districts, sites, buildings, structures, and objects significant in U.S. history, architecture, archeology, engineering and culture. The Secretary of the Interior delegated the authority and responsibility for administering the National Register to the NPS (NPS, 2016). The Colorado OAHP assists with the listing of historically and architecturally significant buildings, structures, and sites in the National Register of Historic Places and the Colorado State Register of Historic Properties (OAHP, 2016). This can include features associated with AMLs including buildings, structures and sites. Historic places in Colorado are nominated to the National Register by the State Historic Preservation Officer (SHPO), the Federal Preservation Officer (FPO) for federal properties, and the Tribal Preservation Officer (TPO) for tribal lands (OAHP, 2012).

Section 106 of the NHPA requires federal agencies to consider the effects of their projects (e.g., projects they execute, fund, or approve) on historic properties. When a federal agency funds, licenses or permits an activity that may affect cultural resources, the agency must consult with the SHPO. This is known as Section 106 review or consultation. State agencies must also consult when their activities involve nominated or listed State Register properties. Local governments may be included in the consultation process (OAHP, 2016). The OAHP maintains a database containing information associated with the Section 106 review process which may include information on the location of historic mining related structures and properties in the State (Table 2). It is updated as sites are brought to the attention of OAHP during the reporting process. Although this database may not include specific information about AMLs, it may include the location of other mine features that were not previously recorded in other AML

databases. A data dictionary and a more detailed description of the information contained within this database were not available at the time of this report.

USGS Digital Data Series 73

The USGS DDS 73 database includes information associated with reconnaissance studies of mining districts located in the central portion of the western slope of Colorado (Nash, 2002) (Table 2). These studies were conducted between 1997 and 1999. The analytical results include chemical analysis of mine dumps, mill tailings, mine drainages, and surface water. The data set includes the locations of 124 smelters, mills, and tailings that were present on either private, public, or mixed ownership properties. It also includes sample results of 160 water samples collected between 1997 and 1998 and 30 water samples collected in 1999. The data associated with this study is provided as MS Excel, tab-delimited text, and ArcGIS files. Sample locations were recorded on 1:24,000 maps and measured with a GPS unit with an accuracy of about +/- 200 feet.

USGS Professional Paper 1651 Database

The USGS PP 1651 database is a relational database designed to assist with evaluation of impacts from historical mining in the Animas River watershed area (Table 2). The database is included as an attachment to this reference. Data are stored within an MS Access database, which is used in conjunction with ArcGIS for data analysis. Sample data in the database was collected between 1982 and 2002 (Church et al., 2007). There are approximately 2,389 sites in the database, which include the locations of mines, mills, tailings, smelters, seeps, springs, streams, sample locations, and water quality data. The ArcGIS files included in this publication include three files, which contain 344 mine sites, names, references, and a summary of the analytical laboratory results for these sites. Also, the ArcGIS files include records associated with 2,014 field sites.

Mine sites included in the database focused on the impact of these sites to the environment. Many mine sites were not included in the inventory, including small prospects, sites located some distance from rivers/lakes, sites that without evidence of significant environmental impact. The locations provided in the database involved review of public records and data from the State of Colorado, USFS, BLM, USGS, CGS, and the Colorado Division of Minerals and

Geology (now defunct). These locations were recorded in a digital file and one representative point was chosen to represent each site based on 1998 digital orthophoto quadrangles. USGS personnel and residents from the area familiar with study area mines verified and revised the locations based on site visits, survey plats, and local knowledge of the area. Some of the site locations were determined from written descriptions (Church et al., 2007).

CDPHE/CDRMS Colorado Abandoned Mines Water Quality Study

In 2016, 145 abandoned mines discharging water were surveyed and sampled during a joint CDPHE/CDRMS draining abandoned mines study (CDPHE, 2017). Field personnel visited 165 mine sites and 145 were draining when they were visited allowing for the collection of water samples. The water quality data, locations, and information collected during this study is available in eRAMS and through the CDPHE Mine Impacted Streams Task Force website (https://www.colorado.gov/pacific/cdphe/WQ-Mine-Impacted-Streams-Task-Force).

Other Potential Electronic Sources of Data

Although this project focuses on existing electronic AML inventories, other sources of electronic data that may contain AML and/or mining location data for future inventories were noted. There are many published reports that contain information on historic mining areas and their associated features. However, many of these do not contain electronic data sets. Other electronic data sets that may include data associated with AML, property ownership, mining, mineral occurrences, etc., include:

Patented/Unpatented Mining Claims
- BLM Legacy Rehost (LR2000);
- BLM General Land Office (GLO) Records;

Abandoned Mines
- BLM Geocommunicator (GC) (now defunct);
- USGS Topographic Map Mine-Related Symbols (may also contain active mines);

Patented Mining Claims/Private Land Records
- County Assessor Office Land Records;

Active Mines

- CDRMS Active Mine Permits;

CERCLA Site Locations

- EPA Environmental Dataset Gateway (EDG) and the Assessment and Total Maximum Daily Load Tracking and Implementation System (ATTAINS);

Coal Mine Information and Maps (for reference purposes only)

- OSMRE National Mine Map Repository (NMMR);

Mineral Occurrences (may include mines and abandoned mines)

- CGS Digital Data Services Uranium-Vanadium Deposits (DDS UV);
- USGS MAS/MILS;
- USGS MRDS; and
- USGS USMIN.

A summary of these data sources is included in Table 3 and on Figure 2. Brief descriptions of these data sources are included in the following subsections.

BLM LR2000

BLM's LR2000 is a searchable database for public reports associated with BLM land mining information including land and mineral use authorizations, conveyances, mining claims, withdrawals, and classifications (Table 3). Generally, LR2000 consists of four systems:

- Case recordation –information on leases, permits, contracts, grants, agreements, and mineral patents issued by the BLM on federal actions affecting public lands;
- Legal land description – survey data;
- Mining claim recordation – unpatented mining claims; and
- Status – information on title transfer documents to and from the U.S. government.

The original documents cannot be viewed on this website, but are available at BLM Information Access Centers (BLM, 2016a). Information from LR2000, especially with regards to unpatented claims, may assist with locating AML on properties where no other documentation exists.

BLM GLO

BLM's GLO provides internet access to federal land conveyance records, including images related to survey plats and field notes, for land title records issued between the early-1800s to the present (BLM, 2016b). This would include records associated with patented mining properties and may provide information for future AML inventories and/or additional data associated with existing inventories. The types of land status records include master title plats, use plats, historical indices, and supplemental plats. Information on land patents for mineral lands, a parcel of land containing valuable minerals in its soil and rocks, includes three types of mining claims: lode claims containing gold, silver or other precious metals occurring in veins; placer claims for minerals not found veins; and mill site claims limited to lands that do not contain valuable minerals and up to five acres of public land claimed for processing minerals (BLM, 2016c). Information from BLM GLO, especially with regards to patented claims, may assist with locating AML on properties where no other documentation exists.

BLM GC

GC is the BLM's website for the publication and distribution of geospatial data to the public (Table 3). Most of the downloadable and viewable layers were removed from GC in 2011 (BLM, 2016d). The GC website indicates that BLM abandoned mines are still available for viewing and downloading; however, the CGS was unable to locate this information on GC. Other available information includes public land survey data (BLM, 2016d). As of 2018, geocommunicator is no longer available and some of the information it contained may be available from a non-profit organization.

USGS Topographic Map Mine-Related Features

The USGS digitized mining-related features from historical USGS topographic maps including prospect pits, shafts, adits, tailing piles, and other features (Horton and San Juan, 2018). These data are available online and include symbols digitized from the USGS 24K, 48K, and 62.5K topographic maps as well as mined area polygons (Table 3). Reportedly, the USGS intends to develop an updated database of mines, mineral deposits and mineral regions in the U.S., which will also replace the USMIN data discussed below. This data set may include active mines.

County Assessor Office Land Records

Several counties in the State provide digital versions of their parcel ownership records (Table 3). County parcel data sets are available for online viewing, printing, and ArcGIS shapefiles are available through some counties at a price. For example, Eagle County provides county parcel data through its interactive map viewer and purchase of ArcGIS files through an annual subscription. At the county level, these data sets may include geographical and ownership information with regards to patented mine claims, private ownership, federal land ownership, and state land ownership. The Colorado Ownership, Management and Protection (CoMAP) service provides access to some county ArcGIS parcel data files as well as other state/federal data through their annual subscription service (https://comap.cnhp.colostate.edu/). However, it is unknown if this service will continue updating these data sets. Again, the location of patented mine claims may assist with locating AML on properties where no other documentation exists.

CDRMS Active/Inactive Mine Permits

The CDRMS website provides downloadable ArcGIS shapefiles with information on the location of active coal permit boundaries, historic coal mines, and active hardrock mine permits associated with gold, silver, lead, zinc, molybdenum, uranium, and other mine types (Table 3). The downloadable active hardrock permit ArcGIS file contains information on the site name, permittee, commodity, mine type, date permit issued, permit type, status (e.g., active, temporary cessation, application in review, etc.), mineral ownership, and surface ownership (CDRMS, 2016c). This information may be useful for AML assessments to determine the geographical relationship between active mines and AML issues. Additionally, the status of the mines are listed and includes some inactive mines.

EPA EDG and ATTAINS

EPA's EDG is a web-based metadata portal that supports the discovery and access to EPA's environmental datasets (Table 3). The EDG contains metadata records submitted by EPA offices and links to geospatial resources described by these metadata records. The content of EDG is managed by EDG stewards who are responsible for contributing and managing dataset

metadata in the EDG for their organization. Metadata submitted is reviewed and approved by an EDG administrator. The EDG website contains links to download data in ArcGIS format and a link to their web-based map viewer. Available downloads included environmental data associated with CERCLA site locations, NPL boundaries, areas where waste was left in place, locations of operable units, and other environmental data. During the writing of this report, most of the ArcGIS files provided by EPA Region 8 were updated in 2014. EPA Region 8 indicated at an AMLSC meeting that up-to-date shapefiles can be obtained by contacting them directly.

EPA also publishes the national dataset in ArcGIS format associated with 303(d) listed waters and other watershed information at their ATTAINS webpage. The EDG and ATTAINS data sets might be of interest when assessing nearby AML sites to determine the proximity of impaired waters and/or NPL listed sites. The EPA recently initiated an integrated reporting georeferenced pilot investigation to investigate alternate ways to streamline the submission and processing of Clean Water Act Sections 303(d) and 305(b) geospatial data (EPA, 2016b).

OSMRE NMMR

The NMMR contains digital and microfilm maps of surface, underground coal, metal, and non-metal mines (Table 3). These maps are available by request and OSMRE maintains a webpage to search the index for available maps by state, county, company name, and/or by mine name. This resource is included here because many of these maps have been scanned and could provide an electronic resource for AML information/ locations. Some of the information found in this repository includes mine names, underground mine plans, mine features, and geographical data (OSMRE, 2016). If available, scanned map images may be obtained and georeferenced in programs such as ArcGIS provided the map contains enough bench marks to obtain an accurate location. These maps may provide additional information associated with underground workings and their relationship (e.g., subsurface connections) to adits, shafts, and other openings observed on the surface.

CGS DDS UV

The CGS DDS UV dataset is available in ArcGIS format and shows points of uranium, vanadium, and copper mining activity and mineral deposits in the Uravan Mineral Belt area within Western Colorado (Table 3). The dataset was developed from two page Mylar maps of the uranium-vanadium deposits of the Uravan mineral belt map, and digitized by DDS for the CGS in June 2010. These datasets include point data and mine names only.

USGS MAS/MILS

The 1998 USGS MAS/MILS database contains information and a geodatabase containing information on mineral properties and resources (USGS, 1998) (Table 3). The MAS/MILS database, obtained from the U.S. Bureau of Mines (USBM) upon its closure, contains over 221,000 records of mineral properties and processing facilities throughout the U.S. and the world. A majority of the records in the database are of sites located in the western U.S. This coverage includes information for the states of Alaska, Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming. Locations in the original MAS/MILS database were converted to a point coverage using GIS (USGS, 1998). The MAS/MILS geodatabase contains data on location, site name (e.g., mine and/or claim names), primary and secondary commodities, status, type of operation (e.g., underground, surface, etc.), and references. Although the information was published in 1998, it contains historical information on over 17,000 mine locations / mineral occurrences within the State.

USGS MRDS

The 2005 MRDS is a relational database developed over several decades by hundreds of researchers (Table 3). It includes mineral resource occurrence data describing metallic and nonmetallic mineral resources in the U.S. and the world. The content was obtained from previously published reports made available to the USGS, and subsumes MAS/MILS. A subset of this database is available in ArcGIS format (e.g., shapefiles) and includes data for site name, deposit name, location, commodity, deposit description, geologic characteristics, production, reserves, resources, and references. These ArcGIS files are a subset of the database comprised of data fields that the USGS deemed most useful and which most frequently contain

information. Full reports of most records are also available. As of 2011, USGS has ceased systematic updates to MRDS and is working to create a new database focused on the U.S. (USGS, 2016). The MRDS database contains over 17,000 records located within the State.

USGS USMIN

Much of the information maintained in MRDS was compiled prior to the use of modern GIS systems. The USMIN project started in 2012 with the goal of modernizing the mineral resources database for the U.S. The objective of the USMIN project is to develop a comprehensive geodatabase of mineral deposits which will include information on geology, production, resources, history, and development status. The USMIN project will include mines, adits, pits, mineral deposits, prospects, occurrences, lithology, name, age, report data, state date, company data, as well as image data for disturbed areas, dumps, tailings, mineralogy, and alteration.

The first phase of the USMIN project is to digitize mining related features from multiple versions of topographic maps spanning several years. Using USGS historical topographic maps, all mine feature symbols on georeferenced topographic quads (1:24,000 scale) are being digitized for Colorado and other states. Other phases of the project include recording features from aerial imagery, converting historic commodity-related maps to digital geospatial information, and a literature/web search is being conducted to obtain historic, non-digital information, as well as to update existing digital information (King et al., 2013). Ultimately, this information will be included in the USMIN database and published by the USGS. Reportedly, after the project is complete, it will also be checked against MRDS. The initial USMIN data set was published in 2016 (Fernette et al., 2016). As of 2018, the status of USMIN is unknown and appears to have been replaced by the USGS topographic prospect and mine-related data set discussed above.

General Assessment of Available Electronic Data

The assessment of the available electronic data was performed prior to the development of the AML information hub and the submission of data provided during the AMLSC. The existing AML

databases were designed by different organizations and are used to store information associated with inventories and then updated, in some cases, to reflect their current status based on field inspections. Some of the databases are static - not updated on a regular basis. Many of the databases contain data fields that are generally similar between databases however, the field names, data types, etc., are not the same and data dictionaries were not available to determine what the data fields specifically contain.   At this time, combining the larger databases into a master statewide inventory is not advantageous due to the lack of similarities between the data types, field names, and lack of documentation. Additionally, separate data sets can easily be queried and updated without the need for reinventing a master AML database or requesting changes to the way other agencies collect data. Additional information associated with the available electronic data is included in Appendix B. An evaluation of existing database fields is presented in Appendix C.

The existing databases that contain a large portion of the existing information associated with either hardrock or uranium AMLs in Colorado include the following databases:

- USFS CGS AML (static) – primarily hardrock;
- BLM AMSCM – primarily hardrock and uranium;
- CDRMS Brass Caps – primarily hardrock and coal;
- DOE DRUM (AUM) – uranium;
- NPL AML – hardrock, uranium and coal;
- USGS DDS 73 (static) – primarily hardrock;
- USGS PP 1651 (static) – primarily hardrock; and
- CDPHE/CDRMS Colorado Abandoned Mines Water Quality Study.

Although other AML data exists, these databases appear to be the principal sources of electronic AML information for Colorado or the "primary" databases (Table 1). Three of these databases are static: products of inventories done in the past that have not been updated over time. The USGS PP 1651 database may include duplicate information from the USFS CGS AML database; however, additional unpublished information was also included in this database.

Some of the primary databases contain smaller sets of information associated with other mine types including coal and industrial minerals.

The following AML information sources have limited information and/or are not considered to be large sources of AML information, but could be used to provide additional AML information:

- EPA GIS data;
- EPA ULD database (static); and
- OAHP database.

These databases do not necessarily contain AML information but could be used to locate mines and provide other information associated with current environmental remediation projects. The EPA GIS database contains limited information and is updated on an as-needed basis. Although it is a useful source of information, it is not considered a primary source for abandoned mine features in Colorado. The EPA ULD is an additional source of AML information; however, it is static and may not provide specific information associated with AML hazards and/or actual mine features. Additionally, the EPA ULD database was created using several of the primary databases listed here, therefore, it could contain duplicate information. The OAHP database is primarily for locating areas/structures that fall under Colorado's historic preservation program. Although it may be a useful source of information on the location of structures, it does not concentrate on AML and likely does not provide specific information about potential hazards.

Database Updates

Of the primary AML databases listed above, the USFS CGS AML inventory, USGS PP 1651, USGS DDS 73, and CDPHE/CDRMS Colorado Abandoned Mines Water Quality Study are static (not updated) and, therefore, provide a snapshot associated with AML features. Other agencies that work across federal and state land boundaries, may have entered this static information into their database and it may be updated with more current information based on their project needs. For example, CDRMS and/or other agencies may have queried the USFS CGS AML database and included the information in their own database which they then subsequently

update. It is important to note again that the CDRMS Brass Caps database is not considered an inventory since it contains information about sites that were reclaimed or sites that are currently, within the last year or so, being addressed. The DOE DRUM, NPL AML, BLM AMSCM, and CDRMS Brass Caps databases are updated and maintained on a regular basis or as time/funds allow.

Data Quality

The data quality associated with the primary databases is unknown. AML information that has not been updated recently by field verification is likely subject to scrutiny. One of the largest data quality issues may be associated with the location data. Location data between records within each database may have been recorded using different methods. Some of the databases contain fields with the source/status of the location which provides additional information on the accuracy of these measurements. Location information may have been recorded by many methods including:

- Aerial photographs or maps which were later digitized;
- Handheld GPS;
- Digitized from mine maps or from USGS quadrangles; and
- Township, range, section, quarter section, and quarter-quarter section.

Therefore, location data from any of these databases should be considered an estimate. AML information contained in the older static databases (e.g., USFS CGS AML) has not been updated for some time. Site conditions at the USFS CGS AML sites may have changed since these data were collected over 15 to 20-plus years ago. Additionally, older records within other databases, such as the BLM AMSCM database, may have never been verified in the field although they were entered into the databases many years ago.

Accessibility

Currently, four of the primary databases are accessible to the public and other agencies including the USFS CGS AML database, USGS PP 1651, USGS DDS 73, and CDPHE/CDRMS Colorado Abandoned Mines Water Quality Study. The USFS CGS AML database is available for free download in geodatabase, Microsoft Access, and Google Earth formats. The USGS PP 151

and DDS 73 are also available for free download on the internet as well as the CDPHE/CDRMS water quality study. The DOE DRUM database was largely based on the EPA ULD database, which is also available to the public and other agencies on request.   The BLM AMSCM, CGS Brass Caps, and NPS AML databases are not available publically. The data dictionary for both the DOE AUM and NPS AML were available upon request.

Data Gaps

After a review of the AML primary databases, the following data gaps were observed:

- AML information associated with private lands and/or patented claims – some of this information may be available in the DRMS database;
- Availability of water quality and flow data associated with some AML inventories - the water quality and flow data may exist but likely are not available electronically or at a centralized location in most cases;
- Some AML databases have multiple features at one location;
- Field verification of some AML sites (e.g., sites entered into databases without field information); and
- Acid leaching potential data for AML mine dumps.

It is important to note that although these may be data gaps, it may not be feasible, from both an execution and cost perspective, for the agencies to collect this information or maintain all of this information in a database. Other possible gaps and or ideas associated with the future collection and evaluation of AML data collected may include:

- Statewide AML field data collection standards;
- Statewide standardized AML numerical status ratings (e.g., physical and environmental hazard ratings) and criteria for the field data collection forms;
- Documentation about the criteria and ratings associated with AML prioritization (the mixed ownership AML group generally has a list of criteria and ratings);
- Details, or a centralized reference library, on mine hydrology, mine workings, subsurface mine connections, mine size, and production records;

- An AML specific process documentation for determining the contaminants of potential concern, and other key water quality parameters, to direct future sampling events and to ensure that the data collected are pertinent to assessing risks (e.g., a Quality Assurance Project Plan for AML with general data quality objectives as well as guidance for determining specific data quality objectives); and

- Links to or references of investigation reports within a geodatabase.

The following subsections discuss the AML information hub.

AML Information Hub Purpose

The following problem statement was developed and discussed during the AMLSC meetings:

"By most estimates there are more than 20,000 abandoned mine features in Colorado. Abandoned mines impact human health and the environment. More than 1,600 stream miles in Colorado are potentially impacted by abandoned mines. Although several federal and state agencies collect abandoned mine information, there is no comprehensive AML information hub for all stakeholders to use to determine impacts, risks of potential impacts, and prioritize restoration efforts."

Although this problem statement may define the ultimate goal of creating an advanced AML information hub, the AMLSC later discussed their concerns with regards to the initial use of an AML information hub as defined in the problem statement. For example, it would be difficult to standardize the criteria, hazard ratings, and current status information between agencies in order to properly evaluate the impacts, risks, and prioritization of AML sites within the information hub. Furthermore, some of the existing electronic databases do not contain any laboratory analytical results or may not have enough electronic information to include in the information hub in order to properly determine the path forward at some AML sites. Therefore, the first phase of the AML information hub concentrated on gathering basic information defined by the AMLSC and making this information readily available for others to view. The second phase, which is being developed in 2018, would include access to additional information provided by the stakeholders in the future.

As determined by the AMLSC, the initial use of the AML information hub would be to share basic information including the geographical location of AML features identified by each agency, the types of features (if available), and to provide agency contact information associated with these features. This information would promote future communications

between the stakeholders by providing location, feature type, and information sources so that individuals can contact the appropriate agency for more information (e.g., non-electronic information, status, etc.) about a particular AML site/feature. The AMLSC preferred this solution because the status of some of the AML features may not be current in each database. Internal identification numbers and contact information was included so that someone could verify the status.

Using a GIS platform, existing geographical electronic data and/or geodatabases can be viewed in conjunction with other spatial information (e.g., base maps or overlays) to determine the relationship between existing AML inventories and other geographical information. The initial AML information hub, when paired with other existing and future geographical information, may assist with:

- Evaluating the geographic extent of AMLs in Colorado;
- Determining potential pathways of exposure by including AML geographical information on base maps with population centers, water bodies (e.g., assess existing impacts to rivers, streams, groundwater and watersheds), etc.;
- Investigating potential responsibility by plotting AML locations on existing digital ownership maps;
- Emergency response by providing AML locations on base maps that include population centers, waterbodies, roads, dams, water rights, and aerial imagery;
- Delineating other inaccessible AML features when combined with high resolution satellite/aerial imagery and LiDAR mapping;
- Determining areas where field visits may be required to collect additional information and in determining more specific areas that need to be inspected;
- Analyzing current inventories for duplicate AML features;
- Evaluating the accuracy of AML feature locations;
- Viewing inventories of other AML or mine related features (e.g., see the USGS prospect- and mine-related topographic symbols discussed above);
- Communicating the estimated number, general characteristics, and locations of AML features to local, municipal, state, and federal government officials as well as the public;

- Identifying watersheds and/or populations that may be vulnerable to AML physical/environmental hazards;
- Better identifying sources of contaminants in impacted water bodies; and
- Developing mitigation plans, cost/benefit analysis, and future mitigation funding.

Other future uses of the AML information hub may include:
- Water quality assessments with the inclusion of water quality data, impaired waterbody information, and water discharge measurements;
- Wildlife, cultural resources, and environmental assessments;
- Mine waste slope stability assessments; and
- Development of a statewide unique identification system for each mine site/feature, ranking criteria, status codes, and standardized AML field inspection checklist.

AML Information Hub Design and Implementation

Initially, CGS developed the AML information hub internally following objectives arrived at with input from the AMLSC. An important aspect that remained to be determined was how to host the web-based site once built. In cooperation with CDPHE, the Colorado State University (CSU) One Water Solutions Institute has developed the eRAMS platform. The eRAMS platform already has many other types of data built in as map layers that could potentially be integrated with the AML information hub in assessing environmental risks and prioritizing remediation. Existing functionality using many other sources of data within eRAMS made it a logical site for hosting the hub.

The AMLSC discussed the development of two AML information hubs: a basic public version and an advanced version. CGS created two ArcGIS projects, for the public and advanced AML information hubs, with the data provided by the agencies. The two ArcGIS projects were published with ArcGIS Server and are consumed by eRAMS. The online graphical user interface for both the public and advanced projects were designed using open source GIS by eRAMS developers. The following subsections discuss the two versions. Figure 3 shows the general AML information hub structure and data flow.

Public AML Information Hub

The public AML information hub is currently available through CDPHE's Mine Impacted Streams Task Force website located here: https://www.colorado.gov/pacific/cdphe/WQ-Mine-Impacted-Streams-Task-Force. Information from the CDPHE/CDRMS Colorado Abandoned Mines Water Quality Study is also available in eRAMS at the same website provided above. After completion, the data in the public AML information hub was also incorporated into a predesigned Watershed Rapid Assessment Program (WRAP) tool in eRAMS (eRAMS, 2018).

The goal of the public facing AML information hub was to allow access to the general location of AML features, define the feature type (if available), and provide agency identification numbers and contact information to allow users to find out more about a particular feature. Other tools were later developed to assist more specific users such as groups performing assessments of watersheds, etc. The public AML information hub does allow users to upload their own information to determine the relationship of these features to specific data sets. Downloads of the AML data are currently unavailable for several reasons: to avoid disseminating draft or working copies of data sets, to avoid issues associated with AML physical hazards and providing a map to access these features, and to avoid providing mine information to "treasure hunters" or others seeking to exploit this information for financial gain.

The initial information hub design was based on input collected during the AMLSC meetings. It was determined that the initial public information hub would be kept relatively simple and each agency would provide data for upload and viewing into an online interactive map. Several requirements were defined during discussions with the stakeholders and include the following:

- Only specific fields were pertinent to the users of the information hub;
- At least one agency representative requested that the data posted online should not be downloadable by each agency;
- Database fields containing status and environmental/physical ratings implemented by some agencies should not be included in the information hub;
- The source or agency providing the data should be included in each record;
- An internal agency identification number should be included for each record;

- The information hub would initially only be accessible to the agency stakeholder group for review and comment;

- Base maps could include property ownership boundaries where available;

- Future data submittals may include consuming specific agency data sets over the internet;

- The information hub would likely have tiered access to different data sets in the future (e.g., advanced AML information hub); and

- Certain agencies indicated that future public access to the information would require controlling the site/feature locations so that the exact location cannot be determined (e.g., the locations would only be visible at a larger scale).

Per several discussions during the AMLSC meetings and general agreement between stakeholders, the following data fields were determined to be pertinent:

- Name – name of feature, or site;

- Mine Name and Claim Name – any fields associated with the mine and/or claim name;

- Feature type – this could include adits, structures, shafts, waste piles, etc.;

- Data Source – agency providing the data and managing the site;

- Unique Identification Code – the ID code that is used to look up the record internally;

- Location X – easting;

- Location Y – northing;

- Coordinate System and Projection – associated with the locations provided;

- Commodity – commodity mined at the location;

- Impact or Hazard – physical or environmental designation;

- Jurisdiction – agency responsible or agency site owner; and

- Metadata – a description of the data set and its source.

Fields associated with the status and physical/environmental ratings were not included because the AMLSC determined it would be difficult, at this time, to reclassify this information based on standardized criteria. The data source field and unique identification code fields were added so that the user could contact the individual agency and provide an internal identification code to

request additional information about a site and/or feature. Additional database field information is included in Appendix B and D.

A request for this information was formally made via email in July 2017. The information provided by the agencies was not always in the format discussed above and some agencies (e.g., CDRMS) provided more data than the AMLSC agreed upon. Also, some of the data provided were for locations outside of Colorado, associated with industrial minerals and other commodities (non-hardrock/uranium locations), and some data sets had multiple features at one location (BLM AMSCM). Additionally, NPS provided a data set where only large areas with multiple AML features were provided.

Advanced AML Feature Reporting Tool

Originally, the CGS and AMLSC envisioned development of two AML tools. The first tool would be a public-facing data hub as already made available and discussed above. A second tool, an advanced AML feature reporting tool, would contain data from the public-facing AML data hub, other publically available environmental data (e.g. surface water chemistry, surface water flow, etc.) from existing data sources, and a module developed by eRAMS to analyze and report the data available in specific areas as defined by the user. As envisioned, this second tool would be accessible to some agencies and their groups who work on specific projects and need to analyze data from several different sources within a single interface. The structure, content, and design of the data analysis module are currently being discussed and reviewed by the AMLSC. A user manual and additional information about the advanced AML feature reporting tool will be provided by eRAMS once it is completed.

Additional Reference Information

The public AML information hub includes base layers provided by eRAMS. These include Google maps, Bing maps, and USGS national maps. Other layers including hydrography data, watershed boundaries, water monitoring locations, etc., were included on the online user interface by eRAMS developers. The public AML information hub ArcGIS project also contains county boundaries and a general land ownership layer provided by the BLM.

Private ownership boundaries may be available in GIS format through some counties where this information is provided for free. Other counties may provide this information for a price. The COMaP dataset includes a compilation of several spatial datasets from Colorado. These datasets include some property ownership, and contributors include the USFS, NPS, BLM, USFW, the Colorado SLB, amongst others. There are several counties that also contribute their spatial land ownership data to COMaP. More information on COMaP is available on their website: https://comap.cnhp.colostate.edu/about-comap/. Ownership datasets for the state/federal agencies may be available from the agencies represented in the AMLSC.

Future Data Acquisition, Updates, and Access

The AMLSC indicated that annual AML information updates would be appropriate. At this time, it is unknown when the AMLSC will request data updates. Any updates to the data will need to be made on the ArcGIS projects, currently maintained by the CGS, and republished using ArcServer. In the future, these ArcGIS projects may be housed, updated, and republished by eRAMS staff. At least two agencies indicated that they could potentially allow access to their data through a web service. For example, the NPS indicated that they may be able to make their database available so that the information hub can access their AML data directly. However, there may be problems with this due to security issues.

Public Outreach

Information about the AML inventory and information hub was presented at the following conferences:

- San Juan Mining and Reclamation Conference (presentation and poster), August 2016;
- San Juan Mining and Reclamation Conference (poster), May 2017;
- Sustaining Colorado Watersheds Conference (poster), October 2017;
- Big Thompson Watershed Forum (presentation), November 2017; and
- Sustaining Colorado Watersheds Conference (presentation), October 2018.

CGS requested data to include in the AML information hub at the AMLSC meeting and via email on 28 July 2016. AML data sets were received from the BLM, USFS, CDRMS (reclamation only), DOE LM, NPS, and EPA between August 2016 and February 2017. The two USGS data sets were from publications downloaded from their website. A summary of the data sets provided to the CGS, including record counts, is presented in Table 4. This table includes record counts for feature types like prospect pits/holes, features listed as "other" or were unknown, as well as counts for fields where the commodity was unknown or not provided. Table 4 also has a summary of some reference data sets that may be included in the advanced AML information hub like the USGS digitized topographic mine symbols data. Table 5 provides a summary of the AML feature types and counts of these features. As shown in Table 4, several agencies provided data that were not associated with hardrock and uranium mines. This was discussed during an AMLSC meeting and it was agreed that this information would be remain in the AML information hub for reference purposes.

To show the general distribution of data received, locations of the data points for each of the primary databases are plotted on a state map in Figures 4 through 8. Figures 4, 5, and 8 include maps with and without prospect pits/holes for the BLM AMSCM, USFS CGS AML inventory, and the USGS prospect- and mine-related mine topographic map symbols, respectively. Data associated with industrial minerals, coal, aggregate, etc., when known, were removed prior to plotting these points. However, due to many unknown commodity and feature types still within these data sets (Table 4), features unrelated to hardrock, mines, uranium mines, and additional prospect pits may be included. Two data sets contain most of the AML information collected for Colorado: BLM AMSCM and the USFS CGS AML inventory (Table 4). The USGS topographic mine symbols data sets also contain over 40,000 mine features from topographic maps for Colorado (Table 4).

Distribution of AML Features by Watershed

The general distribution of mine features across Colorado within defined hydrologic unit code - 12 digit (HUC12) watersheds is included for the BLM AMSCM data set (Figure 9), USFS CGS AML

inventory (Figure 10), and USGS topographic prospect and mine-related symbols (Figure 11). As indicated above, these data sets generally contain most of the information for Colorado. The HUC12 mine feature concentrations associated with the BLM AMSCM data are estimated as there are multiple features associated with one location (e.g., many of these feature locations could cross HUC boundaries). Although a HUC12 may have a high concentration of mine features, it may or may not be an area of concern. These maps were provided to show the general distribution of mine features throughout Colorado. Maps within these figures show the distribution of features, with and without prospect pits/holes, per HUC12. In Figure 11, the USGS topographic mine symbols from each point and polygon data set were combined and counted for each HUC12.

The BLM and USFS CGS features per HUC12 were combined into one map and are shown on Figure 12 and Figure 13, with and without prospect pits/holes, respectively. They are also shown on these figures with HUCs only containing over 50 mine features. The USGS prospect- and mine-related topographic mine symbols, without prospects, are shown on Figure 14. Prospect pits or holes were not included in some of these maps because generally, prospect pits are small AML features which usually are not associated with large openings or workings and therefore, present less of a hazard when compared to open adits, shafts, and leaking mine features. The top two hundred HUC12 areas by mine feature count, using the BLM AMSCM and USFS CGS AML inventories without prospect pits/holes, is summarized in Table 6.

The CGS performed a desktop comparison of mining features from the USFS CGS AML inventory, USGS topographic prospect and mine-related symbols, and features identified using LiDAR data in the St. Kevin mining district near Leadville, CO (Appendix D). Many additional mine features were identified using the LiDAR information due to the ability of LiDAR to map surfaces through forested terrain as discussed in Appendix D. Although many more features were identified, a field inspection of these features would still be required as many of these features are likely associated with prospect pits/holes and may or may not contain physical and/or environmental hazards. LiDAR is a very useful reconnaissance tool that should be used in conjunction with field assessments to provide accurate locations of mining features, and potential features, in areas where it may be difficult to see on the ground. Data from the field assessment can be used to better evaluate and assess the pits and piles identified using LiDAR. The CGS also completed a field comparison of mining features identified in LiDAR to the features identified during the CGS USFS AML field inventory at the Polar Star Mine located in Eagle County. The results of this study are also included in Appendix D.

REFERENCES

BLM, 2006, The Cooperative Conservation Based Strategic Plan for the Abandoned Mine Lands
Program, Colorado State Office, Abandoned Mine Land Workplan, Period: FY2007-FY2013,
March 2006, 92 p.

BLM, 2007, Abandoned Mine Land Program Policy Handbook, United States Department of the
Interior, Bureau of Land Management, BLM Handbook H-3720-1, Rel. 3-331, 20 March 2007,
93 p.

BLM, 2008, Bureau of Land Management Abandoned Mine/HazMat Inventory Field Inspection
Checklist, Temporary Form 1703-2, August 2008, 7 p.

BLM, 2013, Abandoned Mine Lands: A New Legacy, May 2016, 36 p.

BLM, 2016a, "About LR2000" website, http://www.blm.gov/lr2000/about.htm, accessed July
2016.

BLM, 2016b, "General Land Office Records" website,
https://www.glorecords.blm.gov/default.aspx, accessed July 2016.

BLM, 2016c, "General Land Office Records about Patents" website,
http://www.glorecords.blm.gov/reference/default.aspx#id=02_About_Our_Documents|01
_Patents, accessed July 2016.

BLM, 2016d, "About Geocommunicator" website,
http://www.geocommunicator.gov/GeoComm/about.htm, accessed July 2016, no longer in
service.

BLM, 2017, "AML Inventory" website, https://www.blm.gov/programs/public-safety-and-
fire/abandoned-mine-lands/blm-aml-inventory.

Burghardt, J.E., Norby, E.S., and Pranger II, H.S., 2014, Abandoned Mineral Lands in the National
Park System – Comprehensive Inventory and Assessment, Natural Resource Technical
Report NPS/NRSS/GRD/NRTR – 2014/906, 60 p.

CDPHE, 2017, Colorado Abandoned Mines Water Quality Study, Data Report – June 2017, 17 p.,
https://www.colorado.gov/pacific/cdphe/WQ-Mine-Impacted-Streams-Task-Force.

CDRMS, 2016a, Colorado Division of Reclamation, Mining and Safety, Department of Natural
Resources website, http://mining.state.co.us/Programs/Coal/Pages/default.aspx, accessed
August 2016.

CDRMS, 2016b, Colorado Division of Reclamation, Mining and Safety, Department of Natural
Resources website, http://mining.state.co.us/About/Pages/History.aspx, accessed August
2016.

CDRMS, 2016c, Colorado Division of Reclamation Mining and Safety, Department of Natural
Resources website, http://mining.state.co.us/Pages/Home.aspx, accessed July 2016.

CDRMS, 2016d, Colorado Division of Reclamation Mining and Safety, Inactive Mine Reclamation
Program website,
http://mining.state.co.us/Programs/Abandoned/Pages/impwelcomepage.aspx, accessed
June 2016.

Church, S.E., von Guerard, P., and Finger, S.E., 2007, Integrated Investigations of Environmental
Effects of Historical Mining in the Animas River Watershed, San Juan County, Colorado, U.S.
Geological Survey Professional Paper 1651, 1,096 p.

CGS, 2018, U.S. Forest Service Abandoned Mine Land Inventory Project website,
http://coloradogeologicalsurvey.org/water/abandoned-mine-land/united-states-forest-
hazard-abandoned-mine-land-inventory-project/.

DOE, 2014, Final Defense-Related Uranium Mines Location and Status Topic Report, U.S. Department of Energy Legacy Management, LMS/S10693, August 2014, 252 p.

EPA, 2006, Uranium Location Database Compilation, Office of Radiation & Indoor Air, Radiation Protection Division, EPA 402-R-05-009, August 2006, 26 p.

eRAMS, 2018, Watershed Rapid Assessment Program (WRAP), website: https://erams.com/documentation/wrap/.

Fernette, G.L., Horton, J.D., King, Zachary, San Juan, C.A., and Schweitzer, P.N., 2016, Prospect- and Mine-Related Features from U.S. Geological Survey 7.5- and 15-Minute Topographic Quadrangle Maps of the Western United States: U.S. Geological Survey data release, http://dx.doi.org/10.5066/F7JD4TWT.

Government Accountability Office (GAO), 2008, Testimony Before the Committee on Energy and Natural Resources, U.S. Senate, Hardrock Mining, Information on Abandoned Mines and Value and Coverage of Financial Assurances on BLM Land, Statement of Robin M. Nazzaro, Director, Natural Resources and Environment, GAO-08-574T, 33 p.

Horton, J.D., and San Juan, C.A., 2018, Prospect- and Mine-Related Features from U.S. Geological Survey 7.5- and 15-Minute Topographic Quadrangle Maps of the United States (ver. 2.0, April 2018): U.S. Geological Survey data release, https://doi.org/10.5066/F78W3CHG.

King, Z., Flack. S, Marci Scofield, Kathleen Tureck, Evan Roberts, Stephen Miles, Rajesh Rajchal, Ken Lambert, Greg Fernette, Carma San Juan, Paul Denning, and Greg Lee (USGS), 2013, Building the U.S. Mineral Resource Database – One Mine Feature at a Time, 17th Annual Workshop on Digital Mapping Techniques, Colorado School of Mines, June 2-5, 2013.

Nash, J.T., 2002, Hydrogeochemical Investigations of Historic Mining Districts, Central Western Slope of Colorado, Including Influence on Surface-Water Quality, USGS Digital Data Series DDS-73, Version 1.0, 180 p.

NPS, 2016, National Park Service website, https://www.nps.gov/nr/regulations.htm, accessed July 2016.

OAHP, 2012, Information on Nominating Properties to the National Register of Historic Places and the Colorado State Register of Historic Properties, Office of Archaeology and Historic Preservation, National Register and State Register Programs, Denver, Colorado. Document 1501, Rev. 07/2012, 13 p.

OAHP, 2016, OAHP website, https://www.historycolorado.org/national-state-registers, accessed July 2016.

OSMRE, 2016, http://mmr.osmre.gov/MMR_Info.aspx, accessed July 2016.

Personal Communication 1, 2016, Communication via email with Ms. Deborah Steckley, Land Management, Department of Energy, 12th July 2016.

Tweto, Ogden, 1974, Geologic Map and Sections of the Holy Cross Quadrangle, Eagle, Lake, Pitkin, and Summit Counties, Colorado, U.S. Geological Survey, I-830.

Sares, M.A., Gusey, D.L., and Neubert, J.T., 2000, Abandoned Mines and Naturally Occurring

    Acid Rock Drainage on National Forest System Lands in Colorado in the International

    Conference on Acid Rock Drainage (ICARD) 2000: Proceedings from the Fifth International

    Conference on Acid Rock Drainage, Volume II, September 2000, published by the Society for

    Mining, Metallurgy, and Exploration, Inc., page 1361, 12 p.

USGS, 1998, MAS/MILS Arc/Info point coverage for the Western U.S. (excluding Hawaii) by J.

    Douglas Causey, U.S. Geological Survey Open File Report 98-512, 28 p.

USGS, 2016, MRDS Online Spatial Data website, http://mrdata.usgs.gov/mrds/.

Tables

Table 1
Summary of Abandoned Mine and/or Lands Definitions

Agency	Definition	Source	Link
BLM	The BLM defines an Abandoned Mine as an abandoned hard rock mine on or affecting public lands administered by the BLM, at which exploration, development, mining, reclamation, maintenance, and inspection of facilities and equipment, and other oerations ceased as of January 1, 1981 (the effective date of BLM's Surface Management regulations codified at 43 CFR Subpart 3809) with no evidence demonstrating that the miner intends to resume mining. This includes, but is not limited to: acid and caustic rock drainages, waste rock, mill tailings, and retort waste. Physical safety hazards may include steep slopes, adits, winzes, raises, buildings, high walls, settling ponds, other water retaining features, as well as other related dangerous structures. For many abandoned mines, no current claimant of record or viable potentially responsible party exists. Abandoned mines generally include a range of mining impacts or features that may pose a threat to water quality, public safety, and/or the environment.	BLM, 2013	https://www.blm.gov/sites/blm.gov/files/uploads/AML_PUB_NewLegacy.pdf
CGS	Abandoned mine lands are those lands, waters, and surrounding watersheds contaminated or scarred by the extraction, beneficiation or processing of coal, ores and minerals. Abandoned mine lands include areas where mining or processing activity is determined to have ceased.	Website	http://coloradogeologicalsurvey.org/geologic-hazards/abandoned-mine-lands/definition/
DOE	DOE defines an abandoned uranium mine (previously referred to in draft reports, presentations, and the DOE website by the acronym AUM) as a feature or complex developed to extract uranium ore for atomic energy defense-related activities of the United States from 1947 to 1970, as verified by purchase of ore by the U.S. Atomic Energy Commission (AEC) or other means. Since the primary basis of the DOE mine database is the AEC production records, defense related uranium mines (mines) are generally associated with a patented or unpatented mining claim (established under the General Mining Law of 1872, as amended) or a lease of federal, state, tribal, or private lands.	Defense-Related Uranium Mines Location and Status Topic Report (DOE, 2014)	https://www.energy.gov/sites/prod/files/2017/07/f35/S10693_LocStatus.pdf
EPA	According to EPA's website for AML, EPA's definition for AMLs on private lands for which EPA has regulatory authority is "those lands, waters, and surrounding watersheds where extraction, beneficiation, or processing of ores and minerals has occurred."	Website	https://www.epa.gov/superfund/abandoned-mine-lands
GAO	Abandoned Hardrock Mine Site as all associated facilities, structures, improvements, and disturbances at a distinct location associated with activities to support a past operation of minerals locatable under the general mining laws.	GAO, 2008	http://www.gao.gov/assets/120/119391.pdf
General (no source)	An abandoned mine (and related features, facilities, and equipment) is a mine on or affecting public lands under the jurisdiction, custody, or control of a federal agency at which, under the authority of the 1872 Mining Law (Title 30 United States Code Sections 22–54), persons or entities outside of the federal government conducted exploration, development, mineral extraction, processing, reclamation, maintenance, or other operations, all of which activities have ceased with (1) no evidence that the mine operator or any identified successor, claimant, operator, or other third party intends to resume those activities and (2) no other evidence of active claim or claimant activity.	Defense-Related Uranium Mines Location and Status Topic Report (DOE, 2014)	https://www.energy.gov/sites/prod/files/2017/07/f35/S10693_LocStatus.pdf
ITRC	Abandoned mine—Excavations, structures, or equipment remaining from a former mining operation that, for all practical purposes, have been deserted while no intent of further mining is evident. An assumption of "abandoned" may be incorrect if an owner still exists, even if the owner has not performed any activity at the location for a long period, in which case the mine may be "inactive."	ITRC website on mining waste guidance	http://www.itrcweb.org/miningwaste-guidance/glossary.htm
NPS	Abandoned mineral lands (AML) are lands, waters, and surrounding watersheds that contain facilities, structures, improvements, and disturbances associated with past mineral exploration, extraction, processing, and transportation, including oil and gas features and operations, for which the NPS takes action under various authorities to mitigate, reclaim, or restore in order to reduce hazards and impacts to resources.	Burghardt and others, 2014	https://www.nps.gov/subjects/abandonedminerallands/upload/NPS_AML-landA-Report_Septermber2014_screen.pdf

NOTES:

BLM - U.S. Bureau of Land Management

CGS - Colorado Geological Survey

DOE - Department of Energy Legacy Management

EPA - U.S. Environmental Protection Agency

GAO - Government Accountability Office

ITRC - Interstate Technology and Regulatory Council

NPS - National Park Service

Table 2
Summary of Existing Electronic Abandoned Mine Land Information

	Agency	Database Name	Status	Year	Inventory Type	Primary Information Type	Format	Primary Hazard Types	Web Reference	Summary
Primary Sources of Electronic AML Information	BLM	Abandoned Mine Site Cleanup Module (AMSCM)	active	created in the 1990s, includes some current information	inventory / project tracking	hardrock/uranium/coal (minor)	Informix (may be moving to SQL Server, ArcGIS, or other platform)	physical / environmental	https://www.blm.gov/programs/public-safety-and-fire/abandoned-mine-lands/blm-aml-inventory	The system stores and reports information about inactive and abandoned mine sites on BLM property. Contains information on hardrock, with minor amounts of uranium and coal, AML sites. The original database was an inventory created in the 1990s and data from recent field inspections are entered into the database.
	CDPHE	Draining Mines (DM) water quality study	static	2017	na	hardrock	ArcGIS / Microsoft Excel	environmental	https://www.colorado.gov/pacific/cdphe/WQ-Mine-Impacted-Streams-Task-Force	In conjunction with CDRMS, CDPHE conducted an abandoned mines water quality study that included field visits and sample collection from 145 draining mines in 2016. The locations and sampling results are presented in a brief report and are available electronically for download.
	CDRMS	Brass Caps	active	current informaiton	project tracking	hardrock/coal	ArcGIS / SQL Server	physical / environmental	http://mining.state.co.us/Programs/Abandoned/Pages/impwelcomepage.aspx	Contains information on hardrock and coal AML projects that have been or are currently being completed.
	CGS	Information Series (IS) 64	static	published in 2008	inventory	coal	Microsoft Access / ArcGIS	na	http://store.coloradogeologicalsurvey.org/product/historic-coal-mines-of-colorado/	The purpose of IS64 is to provide coal information for all known coal mines that operated in Colorado between 1864 and 2008. There are 1,747 coal mines or prospect pits listed in the database, which describes the coal mine name, location, geologic setting, coal quality data, production, with additional remarks and references.
	DOE LM	Defense-Related Uranium Mines (DRUM) Program Database / Abandoned Uranium Mine or AUM Database	active	1947 to 1970 information, current information?	inventory / project tracking	uranium (only defense-related)	na	physical / environmental	https://www.energy.gov/lm/defense-related-uranium-mines-program	Contains an inventory of mines or areas developed to extract uranium ore for atomic energy defense-related activities of the U.S. Atomic Energy Commission (AEC) between 1947 and 1970. This database was created between 2013 and 2015 and contains some of the location from the other data sources described here. DOE and BLM formed a partnership in 2016 to verify and validate the condition of defense-related uranium mine sites on BLM land in Colorado. Otherwise known as the Defense-related Uranium Mine (DRUM) database.
	NPS	NPS AML Database	active	created in 1990s, current information	inventory / project tracking	hardrock/uranium/coal	na	physical / environmental	https://www.nps.gov/subjects/abandonedmineralands/index.htm	Several earlier efforts were made to document and inventory AML sites by the NPS and the basic structure of the existing database was developed in 2009. The NPS conducted an AML inventory between 2010 through 2013. This inventory was completed to provide a comprehensive AML inventory, to categorize the mitigation needs, and to estimate the resources needed to address priority sites.
	OSMRE	Abandoned Mine Land Inventory System (e-AMLIS)	active	current information	inventory / project tracking	coal	na	physical / environmental	https://amlis.osmre.gov/Default.aspx	An inventory of land and water impacted by past mining (primarily coal mining) to provide information needed to implement the 1977 SMCRA. This inventory only contains problems eligible for reclamation using the Abandoned Mine Reclamation Fund. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.
	USFS / CGS	CGS USFS Abandoned Mine Land (AML) Inventory	static	information collected between 1991 to 1999	inventory	hardrock	ArcGIS / Microsoft Access	physical / environmental	http://coloradogeologicalsurvey.org/water/abandoned-mine-land/united-states-forest-hazard-abandoned-mine-land-inventory-project/	The CGS completed a field inventory of abandoned and inactive hardrock mines on USFS lands in the State between 1991 and 1999. Approximately 18,000 abandoned mine-related features were inventoried including about 900 features with significant enough environmental problems to warrant further investigation. Areas with natural acid rock drainage were also noted on field forms.
	USGS	USGS Digital Data Series 73	static	published in 2002 - data collected between 1997 and 1999	inventory	hardrock and other	ArcGIS / Microsoft Excel	general locations / environmental	https://pubs.usgs.gov/dds/dds-073/	An inventory of inactive mines and mine-related features (mills, tailings, and smelters) located in the central Western Slope area of Colorado. Database includes water sample laboratory results as well as mineralized rock sample results. Locations were collected on 1:24,000 topographic maps and verified with GPS (+/- 200 feet).
	USGS	USGS Professional Paper (PP) 1651	static	published in 2007 - data collected between 1982 and 2002	inventory	hardrock	ArcGIS / Microsoft Access	general locations / environmental	http://pubs.usgs.gov/pp/1651/	An inventory of inactive mines and mine-related sites in the Animas River watershed concentrating on sites that had the potential for environmental impacts to streams. Site locations were verified using digital orthophoto quadrangles and includes discharge and water quality information. Sources include the USGS, USFS AML, BLM, Colorado Division of Minerals and Geology, state records, published/unpublished reports, residents, etc.
Other Sources of Electronic AML Information	CGS	Mine Subsidence Information Center (MSIC)	static	pre-1977 information	inventory	coal	ArcGIS	general locations	http://coloradogeologicalsurvey.org/geologic-hazards/subsidence-mine/	Internal database containing ArcGIS information /georeferenced maps with the approximate locations of underground coal mines prior to the 1970s permitting process. In the past, this was known as the Mine Subsidence Information Center maintained by CGS and funded by CDRMS.
	EPA	Geographical Information System (GIS) Database	active	current information	inventory	hardrock	ArcGIS	environmental	https://www.epa.gov/superfund/abandoned-mine-lands	Geographic locations of CERCLA/mixed-ownership mines/mills/smelters. Website shown is the general EPA AML website.
	EPA	Uranium Location Database (ULD)	static	2006	inventory	uranium	Microsoft Access / ArcGIS	general locations	https://www.epa.gov/radiation/uranium-mines-and-mills-location-database-0	EPA compiled mine location information from federal, state and Tribal agencies into a single database as part of its investigation into the potential environmental hazards of wastes from abandoned uranium mines in the western U.S. including Colorado. Includes data from CDRMS Brass Caps, BLM, USFS, and the USGS databases.
	OAHP	na	active	current information	inventory / project tracking	hardrock/coal/uranium	na	na	na	Contains information collected during the Section 106 review process including the location of historic mining related structures and properties. May not include specific data associated with AML.

NOTES: Status column indicates if this database is currently being updated (active) or will likely not be updated (static) in the future.

BLM - U.S. Bureau of Land Management
CDPHE - Colorado Department of Public Health and Environme
CDRMS - Colorado Division of Reclamation, Mining, and Safety
CGS - Colorado Geological Survey
DOE LM - Department of Energy Legacy Management
EPA - Environmental Protection Agency
NAD - North American Datum

NPS - National Park Service
OAHP - Office of Historic Preservation
OSMRE - Office of Surface Mining, Reclamation, and Enforcement
PP - Professional Paper 1651
SMCRA - Surface Mining Control and Reclamation Act
USFS - United States Forest Service
USGS - United States Geological Survey
na - not available or unknown

Table 3
Summary of Other Mining Information Sources

Agency	Database Name	Status	Year	Primary Mine Information	Format	Web Reference	Summary
BLM	General Land Office (GLO)	active	current	patented mining claims / land patents including mineral patents / general locations	web	http://www.glorecords.blm.gov/search/	Online access to federal land conveyance records for land title records issued between the early-1800s to present. Includes land patents for mineral lands/mining claims (e.g. lode, placer, mill site claims).
BLM	Geocommunicator (GC)	na	na	na	web / arcGIS	na	Most of the downloadable and viewable layers were removed from GC in 2011. This data set may still contain active mining claims for the State of Colorado, derived from Legal Land Descriptions contained in the BLM LR2000 Database. The GC website indicates tha BLML abandoned mines may still be available for viewing however, this information could not be located. Geocommunicator appears to be unavailable as of 2017.
BLM	Legacy Rehost (LR) 2000	active	current	unpatented mining claim general locations	web	http://www.blm.gov/lr2000/	The Bureau of Land Management's Legacy Rehost System called LR2000 provides reports on BLM land and mineral use authorizations for oil, gas, and geothermal leasing, rights-of-ways, coal and other mineral development, land and mineral title, mining claims (including unpatented mining claims), withdrawals, classifications, and more on federal lands or on federal mineral estate.
CDRMS	na	active	current	active / non-active/ historical mining permits / locations	web / arcGIS	http://mining.state.co.us/Reports/Pages/GISData.aspx	Downloadable ArcGIS files and web viewer for permitted mines, active construction permits, active hardrock permits, coal mine permit boundaries, and historic mine boundaries. It is unknown how often these shapefiles are updated. Imaged mining document data is also available online here: http://mining.state.co.us/Reports/MiningData/Pages/ImagedDocumentData.aspx.
CGS	Digital Data Services Uranium-Vanadium Deposits (DDS UV)	static	2010	general locations	arcGIS	na	This dataset is available in ArcGIS format and shows points of uranium, vanadium, and copper mining activity and mineral deposits in the Uravan Mineral Belt area in Western Colorado. The dataset was developed from two page mylar maps of the uranium-vanadium deposits of the Uravan mineral belt map, and digitized by DDS for the CGS in June 2010.
County Assessor Land Records	na	active	current?	unpatented mining claim general locations	web / hard copy	na	Several counties in the State provide digital versions of their parcel records. County parcel data sets are available for online viewing, printing, and ArcGIS shapefiles are available through some counties at a price. At the county level, these data sets may include geographical and ownership information with regards to patented mine claims, private ownership federal land ownership, and state land ownership.
EPA	Environmental Data Gateway (EDG)	na	na	na	web / arcGIS	https://edg.epa.gov/metadata/catalog/main/home.page	A web-based metadata portal that supports the discovery and access to EPA's environmental datasets. Available downloads included environmental data associated with CERCLA site locations, NPL boundaries, areas where waste was left in place, locations of operable units, and other environmental data.
Field Offices - BLM and USFS	na	na	na	na	electronic / hard copy	na	Representatives from the BLM and USFS indicated that additional data on abandoned mine sites may be located on hard copy or electronic forms/databases at their field or other offices.
OSMRE	National Mine Map Repository (NMMR)	na	na	general locations	web	http://mmr.osmre.gov/	Contains digital and microfilm maps of surface, underground coal, metal, and non-metal mines. These maps may provide an electronic resource for AML information.
USGS	Prospect- and Mine-Related Featueres on USGS Topographic Maps	static / updated from time to time	2017	general locations	web / arcGIS / arcServer	https://www.sciencebase.gov/catalog/item/5a1492c3e4b09fc93dcfd574	The USGS digitized mining-related features from historical USGS topographic maps including prospect pits, shafts, adits, tailing piles, and other features. These data are available for download and include symbols digitized from 24K, 48K, and 62.5K topographic maps as well as mined area polygons. Includes hardrock, uranium, coal, industrial mineral, aggregate pit, as well as other mining related features. Reportedly, the USGS intends to develop an updated database of mines, mineral deposits and mineral regions in the U.S.
USGS	Mineral Availability System / Mineral Industry Location System (MAS/MILS)	static	1998	general locations	arcGIS	http://pubs.usgs.gov/of/1998/0512/	The MAS/MILS geodatabase contains data on location, site name (e.g. mine and/or claim names), primary and secondary commodities, status, type of operation (e.g. underground, surface, etc.), and references. Although the information was published in 1998, it contains historical information on over 17,000 locations in Colorado.
USGS	Mineral Resources Data System (MRDS)	static	2005 / 2011	general locations	web / arcGIS / database	http://mrdata.usgs.gov/mrds/	This database is a relational database developed over several decades by hundreds of researchers. It includes mineral resource occurrence data describing metallic and nonmetallic mineral resources in the U.S. The content was obtained from previously published or reports made available to the USGS and subsumes MAS/MILS (see above). As of 2011, USGS has ceased systematic updates to MRDS and is working to create a new database focused on the U.S. (see USMIN below). The MRDS database contains over 17,000 records located within the State.
USGS	U.S. Mineral Resource Database (USMIN)	na	2012 / 2016?	general locations	arcGIS	https://www.sciencebase.gov/catalog/item/57a8fa88e4b0ebae89bc7222	A large volume of information maintained in MRDS was compiled prior to the development and use of modern geospatial technologies. The USMIN project, started in 2012, is a new initiative to modernize the mineral resources database for the U.S. The objective of the USMIN project is to develop and publish a comprehensive geospatial database of mineral deposits which will include information on geology, production, resources, history, and development status. These data are currentlly being compiled by the USGS and include the locations of prospect and mine related features digitized from current and historical topographic maps. As of 2018, the status of USMIN is unknown and appears to have been replaced by the USGS topographic prospect and mine-related data set.

NOTES: Status column indicates if this database is currently being updated (active) or will likely not be updated (static) in the future.
BLM - Bureau of Land Management
CDRMS - Colorado Division of Reclamation and Mining Safety
CGS - Colorado Geological Survey
EPA - Environmental Protection Agency
na - not available or unknown
OSMRE - Office of Surface Mining, Reclamation, and Enforcement
USGS - United States Geological Survey

Table 4
Summary of AML Information

Agency	Database	General commodity	Total records	Mine areas, general mine locations, mine sites[1]	Mine features[2]	Prospect pits, holes, prospect related.[5]	Feature type "Other", not listed, or unknown	Locations outside of Colorado	No Coordinates provided	Commodity Type not associated with hardrock or uranium mining (e.g. industrial minerals, aggregates, coal, etc.)	Colorado hardrock and uranium AML records with coordinates	No Commodity provided (see notes)[3]	Notes
				Total record details (estimated)									
BLM	BLM AMSCM	metals, industrial, coal, uranium	16,937	6,785	16,937	1,987	4,423	11	-	309	16,617	7,728	16,937 features at 6,785 point locations (multiple features with the same coordinates). About 1,964 prospect pits associated with the hardrock and uranium feature types.
DOE LM	DRUM/AUM	uranium	1,527	1,527 (see notes)	-	-	-	4	125	-	1,398	-	Mine locations only. Not counting the 125 sites without coordinates, approximately 1,142 sites with unique coordinates and 1,398 mines. Multiple mine locations at one site.
EPA	EPA GIS	metals, unknown	177	-	177	-	7	61	-	-	116	177	Seven of these locations do not have a mine name or mine feature description.
		metals, unknown	748	481	-	-	-	267	-	-	481	748	Mostly general mine locations. 481 locations within Colorado (479 unique locations - one location has multiple sites with the same coordinates).
NPS	NPS AML	metals, industrial, other	220	21	220	58	24	-	-	20+	< 200 (see notes)	220	Actual feature locations are not shown with the GIS data provided. 21 general areas where these features occur was provided. Feature notes indicate several quarries, gravel pits, and other non-mining related features (at least 20). Difficult to determine the exact quantity of non-related hardrock and uranium features.
USFS	CGS AML	metals, industrial, coal, uranium	11,502	-	11,502	3,189	356	-	-	499	11,003	357	357 features do not have a commodity listed. 11,480 unique locations (some locations with multiple features).
		metals, industrial, coal, uranium	6,890	-	6,890	na	na	-	-	266	6,624	135	135 features do not have a commodity listed. 6,868 unique locations (some locations with multiple features).
		metals, industrial, coal, uranium	2,742	2,742	-	-	-	-	-	193	2,549	170	47 areas that do not have a site name.
USGS	PP 1651	metals	374	374	232	-	-	-	-	-	374	-	Mine locations only, specifically in the Animas River watershed only (southwestern Colorado). Includes estimates of the number of shafts, adits, and flowing adits at the location provided but no unique coordinates for each feature. Approximately 36 shafts and 196 adits (117 which were flowing adits). Includes some sample results. Note that some areas did not have any shafts or adits hence the greater amount of areas versus features.
USGS	DDS-73	metals, uranium	124	-	124	-	-	-	-	-	124	-	Includes general locations of smelters, mills, and tailing piles in southwestern Colorado (Gunnison, Ouray, Hinsdale, San Miguel, Montrose, Mesa, and San Juan counties). Also includes sample locations and results from specific features. 117 unique locations (7 locations have multiple features).
Reclamation Information													
CDRMS	Brass Caps	metals, industrial, coal, uranium, other	14,013	12,011	14,013	12	224	-	-	1,982	12,031	4,384	Contains 1,982 coal mine, industrial mineral, and "MULTI" feature locations, and 4,384 with no commodity labeled. 3,808 records do not have a mine name or claim name. Contains multiple sets of coordinates in varying coordinate systems.
Other Mining Reference Information													
CGS	IS64	coal	1,576	1,576	na	na	na	-	-	1,576	na	-	Dataset for reference purposes only. Contains historic coal mine locations. Coal region file contains 169 coal regions.
CDRMS	Permit Locations	coal, industrial, aggregate, metals, borrow, reclamation, uranium ,etc.	5,931	na	na	na	na	-	-	na	na	-	Data set for reference purposes only. Active and inactive mining permit locations from the DRMS GIS website. Only some permit locations (e.g. for gold) are shown on the AML information hub.
EPA	EPA ULD	uranium	990	990	na	na	na	-	3	-	987	-	Data set for reference purposes only. Locations of mines, claims, and other features. Multiple locations with the same coordinates: 990 mine locations at 586 unique locations (multiple sites at one location).
USGS	Digitized Topographic Map Mine Symbols	metals, industrial, coal, uranium	35,381	-	35,381	20,566	na	-	-	3,195	32,186	35,381*	Mine feature locations digitized from 1:24,000 scale USGS topographic maps. Commodity types not listed but in some cases may be deduced from feature type and/or feature name.
		metals, industrial	65	-	65	10	na	-	-	18	47	65*	Mine feature locations digitized from 1:48,000 scale USGS topographic maps. Commodity types not listed but in some cases may be deduced from feature type and/or feature name.
		metals, industrial, coal, uranium	7,850	-	7,850	3,839	na	-	-	319	7,531	7,850*	Mine feature locations digitized from 1:625,000 scale USGS topographic maps. Commodity types not listed but in some cases may be deduced from feature type and/or feature name.
		metals, industrial, coal, uranium (?), borrow	2,354	2,354	-	-	-	-	-	1,458	896	2,354	Mined area locations digitized from 1:24,000 scale USGS topographic maps. Commodity types not listed but in some cases may be deduced from feature type and/or feature name.
		metals	1	1	-	-	-	-	-	-	1	1	Mined area locations digitized from 1:48,000 scale USGS topographic maps. Commodity types not listed but in some cases may be deduced from feature type and/or feature name.
		metals, industrial, coal, uranium(?)	160	160	-	-	-	-	-	30	130	160	Mined area locations digitized from 1:625,000 scale USGS topographic maps. Commodity types not listed but in some cases may be deduced from feature type and/or feature name.

NOTES:

All quantities are estimated.

[1] - USFS mine areas are where inventories were completed; BLM and CDRMS have multiple features at some sites with the same coordinates which may or may not be different feature types - associated numbers only count one site at one location; USGS topo mine areas are actual polygons showing piles/quarries, etc.

[2] - USFS mine features incloude mine piles (3,108) and other mine features (5,549). USGS Animas River Watershed database contains single mine locations with mine feature counts (e.g.. Adit, shafts, etc. however, locations of features are not located outside of the general mine location).

[3] - This field includes blank records or where a commodity field in the database did not exist. The USGS Topo Mine Symbols data sets sometime include feature descriptions that allow the determination of the commodity. Also, this field provides a count of records that may or may not be associated with hard rock and/or uranium mines.

* - An additional 29 features have feature names (e.g. "Ftr_Name") in the combined 24K, 48K, and 625K files that are associated with coal, clay, and other non-hardrock or uranium mining. Only 3,244 of these records have actual feature names.

AML - abandoned mine land
AMSCM - abandoned mine site cleanup module
AUM - Abandoned uranium mine
BLM - Bureau of Land Management
CDRMS - Colorado Department of Reclamation, Mining, and Safety
CGS - Colorado Geological Survey
DOE LM AUM - Department of Energy Legacy Management Abandoned Uranium Mine
EPA - Environmental Protection Agency
GIS - geographical information systems
IS64 - Information Series 64
na - not applicable, unknown or unavailable
NPS - National Park Service
ULD - Uranium location database
USFS - United States Forest Service
USGS PP 1651 - United States Geological Survey Professional Paper 1651.

Table 5
Summary of Mine Features

BLM AMSCM	Feature Count
WASTE ROCK DUMP	4836
OTHER	4423
ADIT OPEN	2839
PROSPECT PIT	1987
SHAFT OPEN	1216
HIGH WALLS/PITS	990
TRENCH	259
ADIT CAVED	199
SHAFT CAVED	61
TAILINGS	55
STRUCTURE/BUILDING	30
MINE/MINERAL PROCESSING MILL	20
DRILL HOLE	10
RESERVE PITS/PRODUCED WATER POND/OTHER E & P WASTE	10
INCLINE	1
REPOSITORY	1

NPS AML	Feature Count
WR (waste rock?)*	59
PR (prospect?)*	58
AD (adit?)*	46
OT (other?)*	20
SM (surface mine?)*	18
SH (shaft?)*	11
UN (unknown?)*	4
BD (building?)*	2
IN (incline?)*	1
ST (stope?)*	1

*Note: Two letter code definitions are unknown but assumed here.

NOTES:
Database Name / Feature Counts - mine feature database record counts
AML - abandoned mine land
AMSCM - abandoned mine site cleanup module
BLM - Bureau of Land Management
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USFS - United States Forest Service
USGS - United State Geological Survey

USFS CGS AML	Feature Count
mine dump	6677
adit	5846
prospect hole	3189
vertical shaft	1624
other	323
open pit	296
incline shaft	122
highwall	70
mill tailings	57
processing site	42
stope	41
subsidence feature	31
not available	31
overburden or development spoil pile	17
place or hydraulic deposit	11
glory hole	6
No Feature Type (Null)	2
coal waste bank	2
dredge spoil	2
mine dump, mill tailings	2
mine dump, processing site	1

CDRMS Brass Caps	Feature Count
Shaft	5466
Adit	5035
Stope	843
Waste Pile	477
Subsidence Feature	424
Prospect Shaft	325
No Feature Type (Null)	224
Incline Shaft	186
Adit/Decline	162
Incline Adit	138
Prospect Adit	133
Mine Fire	78
Shaft/Stope	64
Shaft/Decline	62
Strip Mine	50
Crown Hole	42
Air Shaft	41
Decline	36
Coal Fire	34
Vent shaft	30
Open Pit	18
Stope/Shaft	18
Stope/Adit	17
Shaft/Adit	13
Prospect Pit	12
Incline	11
Tunnel	11
Vent/Stope	9
Incline Stope	8
Glory Hole	7
Dump	6
Mill Facility	6
Glory Hole w/Drifts	5
Headframe/Shafthouse	5
Mine Facility	5
Sink Hole	5
Refuse Pile	4
Drift	2
Slope Entry	1

USGS Topo Feature Points (24, 48, and 62.5)	Feature Count
Prospect Pit	24415
Adit	10545
Mine Shaft	3981
Gravel Pit	2413
Open Pit Mine	716
Quarry	541
Open Pit Mine or Quarry	195
Gravel/Borrow pit - Undifferentiated	140
Clay Pit	100
Air Shaft	80
Borrow Pit	77
Sand Pit	32
Strip Mine	20
Placer Mine	13
Mill Site	11
Coal Mine	6
Quarry - Rock	2
Shale Pit	2
Uranium Mine	2
Caliche Pit	1
Cinder Pit	1
Diggings	1
Glory Hole	1
Sand and Gravel Pit	1

USGS Topo Feature Polygons (24, 48, and 62.5)	Feature Count
Gravel Pit	989
Mine Dump	778
Quarry	173
Disturbed Surface	142
Tailings - Undifferentiated	87
Tailings - Pond	66
Strip Mine	65
Clay Pit	54
Open Pit Mine	39
Tailings - Placer	27
Gravel/Borrow Pit - Undifferentiated	26
Borrow Pit	20
Tailings - Dredge	17
Tailings - Mill	7
Salt Evaporator	6
Disturbed Surface - Pit	6
Sand Pit	5
Glory Hole	3
Slag Pile	2
Settling Pond	2
Placer Mine	1

Table 6
Top 200 HUC12 By Mine Feature Count

	HUC12 ID	HUC12 Name	Total Mine Features (estimated)	BLM Mine Feature Count	USFS CGS Mine Feature Count	Area (acres)	States
1	140200030509	Outlet Cochetopa Creek	1089	1086	3	33176	CO
2	140300030707	Hieroglyphic Canyon-San Miguel River	688	688	0	33060	CO
3	140801040101	Headwaters Animas River	664	664	0	27373	CO
4	140100020202	Peru Creek-Snake River	558	0	558	26667	CO
5	130100030102	Cottonwood Creek-Kerber Creek	532	225	307	39851	CO
6	101900040206	North Clear Creek	488	267	221	38491	CO
7	140300020706	140300020706	457	457	0	26068	CO
8	140801040103	Mineral Creek	447	11	436	33832	CO
9	140200060203	Headwaters Uncompahgre River	445	11	434	25831	CO
10	140200060201	Red Mountain Creek	430	10	420	13660	CO
11	101900050403	Fourmile Creek	429	174	255	15535	CO
12	101900010102	Headwaters Middle Fork South Platte River	422	0	422	22096	CO
13	110200010202	East Fork Arkansas River	411	325	86	32835	CO
14	140300040401	Red Canyon-Dolores River	408	408	0	12921	CO
15	110200010404	Cache Creek-Arkansas River	396	360	36	30474	CO
16	140801040102	Cement Creek	364	328	36	13059	CO
17	140200010205	Oh-be-Joyful Creek-Slate River	361	3	358	21472	CO
18	140300021003	Bull Canyon	355	355	0	19859	CO
19	101900050502	Upper South Boulder Creek	323	0	323	26134	CO
20	110200011213	Deweese Reservoir	318	318	0	9195	CO
21	140801040104	Cunningham Creek-Animas River	315	315	0	27737	CO
22	140200010204	Coal Creek	305	0	305	13146	CO
23	101900050302	Upper Left Hand Creek	300	121	179	14845	CO
24	140300021002	Little Gypsum Creek-Dolores River	287	287	0	16528	CO
25	110200010501	Headwaters Chalk Creek	281	0	281	33975	CO
26	110200010206	City of Leadville-Arkansas River	280	263	17	42183	CO
27	101900010101	Mosquito Creek	277	72	205	10358	CO
28	140200030508	Rock Creek-Cochetopa Creek	270	264	6	23756	CO
29	110200010902	Maverick Gulch-Arkansas River	269	269	0	23314	CO
30	110200020203	Cripple Creek-Four Mile Creek	258	258	0	39321	CO
31	140200030202	Outlet Razor Creek	255	251	4	18846	CO
32	110200011302	Johnson Gulch	254	254	0	11532	CO
33	110200011212	City of Westcliffe-Grape Creek	244	244	0	21041	CO
34	140300030106	Headwaters San Miguel River	225	0	225	33094	CO
35	140801050101	Headwaters La Plata River	225	0	225	14111	CO
36	140200040301	Ruby Anthracite Creek	214	0	214	32682	CO
37	140200020603	North Fork Henson Creek-Henson Creek	213	195	18	22722	CO
38	130100020302	Headwaters Alamosa River	200	0	200	24185	CO
39	140300021001	Big Gypsum Creek	199	199	0	28399	CO
40	110200011207	Wilmer Gulch	196	196	0	13297	CO
41	110200010601	Middle Fork South Arkansas River	192	0	192	23839	CO
42	130100040307	130100040307	185	185	0	29479	CO
43	140200020201	Upper East River	184	0	184	17205	CO
44	140300040402	Calamity Creek	181	181	0	30081	CO
45	101900050301	Little James Creek	174	8	166	11921	CO
46	140300030101	Howard Fork	174	0	174	10202	CO
47	140300020702	Summit Canyon	169	169	0	31884	CO,UT
48	140300020903	Lion Canyon-La Sal Creek	162	162	0	14924	CO,UT
49	130100030201	Headwaters San Luis Creek	159	63	96	31084	CO
50	101900040204	Outlet Chicago Creek	159	0	159	12142	CO
51	140300020203	Dolores River-Rico Valley	157	0	157	15434	CO
52	110200010102	South Fork Lake Creek	155	0	155	14374	CO
53	140100020102	French Gulch-Blue River	151	0	151	17340	CO
54	101900050402	Middle Boulder Creek	149	0	149	28346	CO
55	140200060202	Canyon Creek	148	0	148	17860	CO
56	110200010701	Trout Creek	144	101	43	41233	CO
57	140100040202	Express Creek-Castle Creek	142	0	142	26534	CO
58	130100010702	West Willow Creek-Willow Creek	136	0	136	12413	CO
59	101900050401	North Boulder Creek	135	0	135	28624	CO
60	140300020605	Joe Davis Hill-Dolores River Canyon	134	134	0	36647	CO
61	110200010103	Lake Creek	133	0	133	38192	CO
62	140200030302	Gold Creek	132	0	132	19349	CO
63	140200030101	Headwaters Tomichi Creek	126	0	126	17981	CO
64	130100040302	Antelope Creek-Sheep Creek	125	125	0	26891	CO
65	101900010209	Fourmile Creek	124	64	60	30780	CO
66	140200020101	Headwaters Blue River	119	0	119	27034	CO
67	140100020103	Swan River	116	0	116	24058	CO
68	140300040408	Cottonwood Canyon-Dolores River	109	109	0	23447	CO
69	140200020509	Road Beaver Creek-Cebolla Creek	107	107	0	25433	CO
70	140300040101	North Fork Mesa Creek	104	104	0	35216	CO
71	110200010203	Turquoise Lake	104	11	93	17629	CO
72	140100020203	Outlet Castle Creek	104	0	104	5504	CO
73	140300020804	Outlet Coyote Wash	100	100	0	21822	CO,UT
74	140100040701	South Fork Crystal River	100	0	100	12197	CO
75	101900010402	Headwaters Tarryall Creek	100	0	100	24177	CO
76	140300021004	Wild Steer Canyon	97	97	0	14030	CO
77	110200010201	Tennessee Creeks	97	0	97	29622	CO
78	110200011408	Copper Gulch	96	96	0	24717	CO
79	110200010706	Railroad Gulch	96	1	95	13681	CO
80	110200010707	Threemile Creek	94	94	0	11455	CO
81	110200021102	Middle Creek	94	0	94	19779	CO
82	130100030402	Wild Cherry Creek	93	66	27	11935	CO
83	140200030301	Upper Quartz Creek	92	0	92	25878	CO
84	140300040203	Outlet Roc Creek	90	90	0	27497	CO,UT
85	140300021101	East Paradox Creek	85	85	0	28859	CO
86	140200010105	Headwaters Willow Creek	84	0	84	16093	CO
87	110200011210	Taylor Creek	83	0	83	21571	CO
88	101900010507	Outlet Tarryall Creek	83	0	83	18442	CO
89	101900010506	Webber Park-Tarryall Creek	82	0	82	24339	CO
90	101900050404	Boulder Creek Canyon	82	0	82	9787	CO
91	140200030405	Wood Gulch-Tomichi Creek	80	78	2	22873	CO
92	110200011307	Temple Canyon-Grape Creek	79	79	0	20680	CO
93	110200011301	Querida Gulch	79	79	0	10540	CO
94	101800020301	South Fork Big Creek	79	67	12	28244	CO,WY
95	101900020604	Pulver Gulch	78	0	78	12772	CO
96	130100040604	Biedell Creek	77	77	0	26201	CO
97	110200010405	Four Mile Creek	77	60	17	24415	CO
98	140200030603	Long Gulch	76	76	0	16198	CO
99	140200010106	Outlet Willow Creek	76	0	76	24511	CO
100	140200030507	West Pass Creek	74	42	32	31849	CO
101	140200020601	Headwaters Lake Fork	71	71	0	36697	CO
102	140300021104	Saucer Basin-Dolores River	70	70	0	19435	CO
103	110200020201	Barnard Creek	68	68	0	12497	CO
104	110200010401	Headwaters Clear Creek	68	0	68	17496	CO

Table 6
Top 200 HUC12 By Mine Feature Count

	HUC12 ID	HUC12 Name	Total Mine Features (estimated)	BLM Mine Feature Count	USFS CGS Mine Feature Count	Area (acres)	States
105	140200020604	Nellie Creek-Henson Creek	67	63	4	30790	CO
106	140100040102	Headwaters Roaring Fork River	67	0	67	18412	CO
107	130100010602	Outlet Miners Creek	67	0	67	10596	CO
108	101900050501	Headwaters South Boulder Creek	66	0	66	19438	CO
109	101900040103	West Fork Clear Creek	65	0	65	36752	CO
110	110200010406	Three Elk Creek-Arkansas River	63	51	12	38714	CO
111	140100010606	Reeder Creek-Colorado River	61	61	0	30086	CO
112	110200011403	Falls Gulch	61	57	4	24730	CO
113	140100040105	Hunter Creek	61	0	61	27575	CO
114	140200020301	Headwaters Willow Creek	60	60	0	20026	CO
115	140200030605	Chance Gulch-Tomichi Creek	60	60	0	25830	CO
116	130100011201	Baughman Creek	59	0	59	15567	CO
117	130100050109	Trail Creek-Conejos River	59	0	59	21187	CO
118	140200020605	Larson Creek-Lake Fork	58	58	0	24785	CO
119	140300040403	Blue Creek	58	58	0	24730	CO
120	140200040307	Anthracite Creek	58	0	58	35770	CO
121	130100040701	Ford Creek	58	0	58	15891	CO
122	140801050102	Mayday Valley-La Plata River	58	0	58	14493	CO
123	140300040404	Maverick Canyon	55	55	0	15128	CO
124	101900050405	Fourmile Canyon Creek	55	55	0	6498	CO
125	110200010709	Squaw Creek-Arkansas River	55	13	42	43720	CO
126	140100040703	Yule Creek-Crystal River	54	0	54	43343	CO
127	140200030303	Middle Quartz Creek	54	0	54	17863	CO
128	140100020401	Dillon Reservoir	54	0	54	25623	CO
129	140100010709	Lower Muddy Creek	53	53	0	15575	CO
130	140100020301	Upper Tenmile Creek	53	0	53	15804	CO
131	140300021005	Spring Canyon-Dolores River Canyon	52	52	0	25914	CO
132	110200010708	Browns Canyon	52	46	6	14909	CO
133	140100010906	Sheep Creek-Colorado River	51	51	0	24519	CO
134	110200010603	Cree Creek-South Arkansas River	50	0	50	8749	CO
135	140200010101	Upper Taylor River	50	0	50	39857	CO
136	140300030102	Lake Fork	49	0	49	14987	CO
137	140100030402	East Brush Creek	49	0	49	20769	CO
138	140200020510	Goose Creek-Cebolla Creek	48	48	0	17753	CO
139	130100030202	Rock Creek	48	28	20	27612	CO
140	101900040201	Fall River	48	0	48	14976	CO
141	140500030102	King Solomon Creek	47	0	47	31312	CO,WY
142	140200030601	Sewell Gulch-Tomichi Creek	46	46	0	15161	CO
143	130100030405	Crestone Creek	46	1	45	24257	CO
144	140801011202	Middle Vallecito Creek	46	0	46	21261	CO
145	140200030604	Stubbs Gulch	45	45	0	25286	CO
146	110200010806	Willow Creek-Badger Creek	45	26	19	34852	CO
147	130100020204	Headwaters Cat Creek	45	4	41	19138	CO
148	130100010701	Whited Creek-East Willow Creek	45	0	45	13320	CO
149	101900010104	Beaver Creek-Middle Fork South Platte River	44	5	39	27293	CO
150	140300020704	Horse Range Spring	43	43	0	10576	CO,UT
151	110200010702	Maxwell Creek-Arkansas River	43	39	4	25554	CO
152	140801040303	Needle Creek	43	0	43	9620	CO
153	140500010207	Willow Creek	43	0	43	24701	CO
154	130100030303	Nolans Gulch-San Luis Creek	42	41	1	40736	CO
155	140200030305	Lower Quartz Creek	42	13	29	15251	CO
156	110200010602	North Fork South Arkansas River	42	0	42	14189	CO
157	140100040106	Roaring Fork River above Aspen	42	0	42	10670	CO
158	130100020303	Jasper Creek-Alamosa River	41	0	41	11283	CO
159	101900010210	101900010210	40	40	0	28150	CO
160	140200030602	Cabin Creek	40	40	0	10105	CO
161	101900010606	Lower Lake George	40	0	40	24657	CO
162	140100030303	Lake Creek	40	0	40	31389	CO
163	101900020202	Headwaters North Fork South Platte River	40	0	40	31497	CO
164	110200011306	Dead Mule Gulch-Grape Creek	39	39	0	33653	CO
165	110200010904	West Creek-Arkansas River	39	39	0	27278	CO
166	140300040503	Lumsden Canyon-Dolores River	39	39	0	37466	CO,UT
167	130100011001	Lime Creek	39	7	32	9816	CO
168	140200030503	Archuleta Creek	37	34	3	37541	CO
169	110200010705	Cottonwood Creek-Arkansas River	37	6	31	28880	CO
170	140300020701	Bush Canyon	36	36	0	11531	CO,UT
171	140300030103	South Fork San Miguel River	36	0	36	11942	CO
172	101900050103	Outlet South Saint Vrain Creek	36	0	36	14364	CO
173	140500050307	Coal Creek	36	0	36	30457	CO
174	101900040205	Soda Creek	36	0	36	8941	CO
175	140100030204	French Creek-Homestake Creek	36	0	36	23967	CO
176	140100040101	Lincoln Creek	35	0	35	21310	CO
177	130100010104	Bear Creek-Rio Grande	35	0	35	22635	CO
178	130100021102	130100021102	34	34	0	39434	CO
179	140100020303	Middle Tenmile Creek	34	0	34	10412	CO
180	101800010305	Roaring Fork	33	32	1	30895	CO
181	110200010302	South Cottonwood Creek	33	0	33	21066	CO
182	130100050104	Lake Fork	33	0	33	6221	CO
183	110200011110	Tallahassee Creek	32	32	0	32098	CO
184	101800020103	Threemile Creek-North Platte River	32	32	0	10468	CO,WY
185	101900010202	Headwaters South Fork South Platte River	32	0	32	32585	CO
186	140300020204	Scotch Creek-Dolores River	32	0	32	24851	CO
187	110200010710	Ute Creek-Arkansas River	31	19	12	21938	CO
188	140100040301	Headwaters Maroon Creek	31	0	31	20529	CO
189	140300020104	Johnny Bull Creek-West Dolores River	31	0	31	21459	CO
190	140100030206	Resolution Creek-Eagle River	31	0	31	20771	CO
191	140200020511	Outlet Cebolla Creek	30	30	0	14785	CO
192	140200020302	Sugar Creek-Willow Creek	30	30	0	26574	CO
193	101800010202	Middle North Fork North Platte River	30	28	2	27491	CO
194	101900010605	Elevenmile Canyon	30	0	30	33869	CO
195	140100010605	Waste Creek-Troublesome Creek	29	29	0	22942	CO
196	140200030404	Hot Springs Creek	29	2	27	28892	CO
197	101900070210	Sevenmile Creek-Cache La Poudre River	29	0	29	18640	CO
198	140100010402	Headwaters Williams Fork	29	0	29	28310	CO
199	140300030706	Atkinson Creek	28	28	0	22152	CO
200	140200030103	Marshall Creek	28	1	27	36724	CO

NOTE: Total feature count is the total BLM and USFS CGS feature count without prospect pits/holes within a HUC12.

All counts are estimated. Does not include AML features provided by other data sources.

BLM - Bureau of Land Management

CGS - Colorado Geological Survey

USFS - U.S. Forest Service

Figures
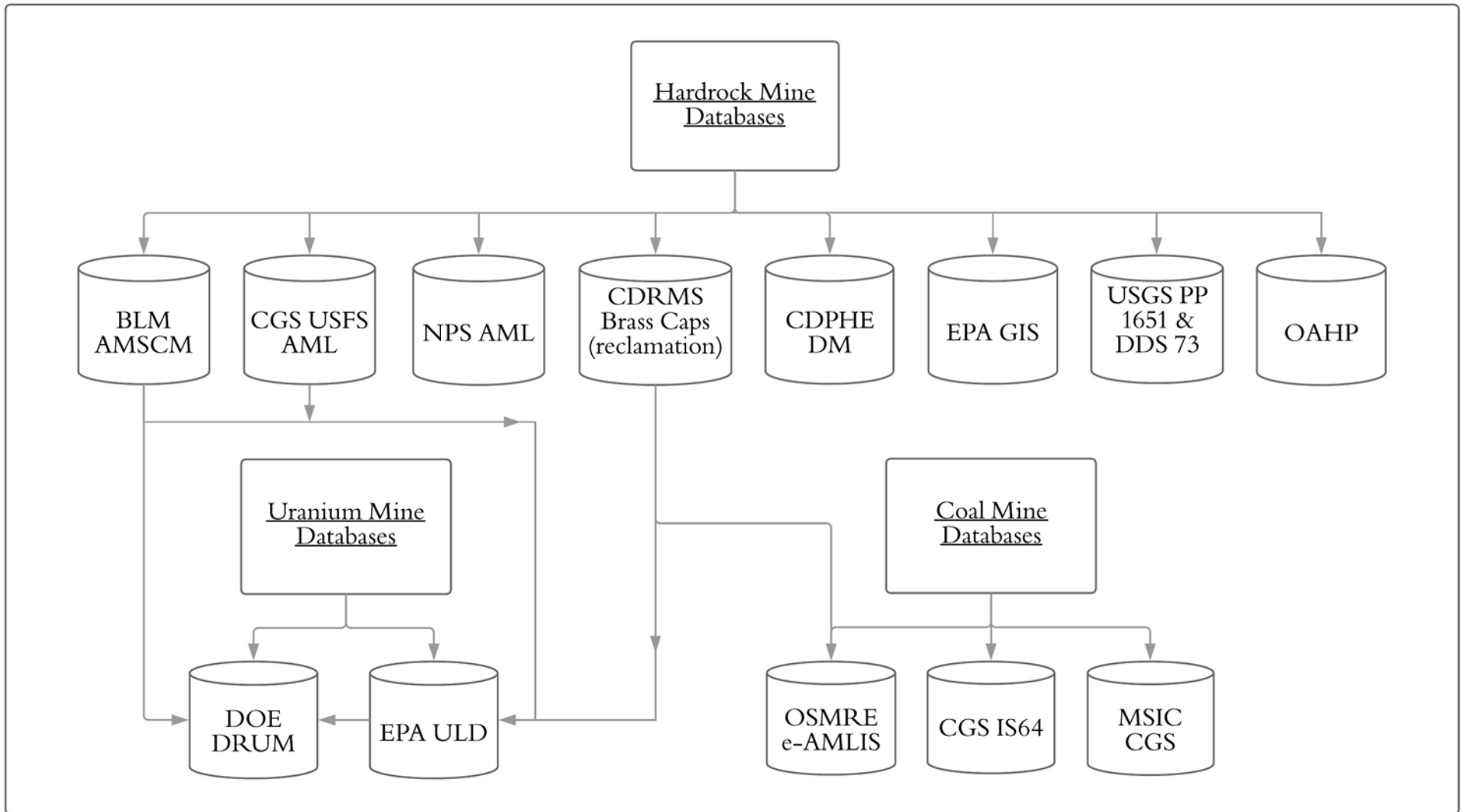
Figure 1 – Existing Sources of Electronic AML Information

NOTES:
AML – Abandoned Mine Land
BLM AMSCM – Bureau of Land Management Abandoned Mine Site Cleanup Module
CDPHE DM – Colorado Department of Public Health and Environment Draining Mines
CDRMS – Colorado Division of Reclamation, Mining, and Safety
CGS IS64 – Colorado Geological Survey Information Series 64
CGS USFS – Colorado Geological Survey United States Forest Service
DOE DRUM – Department of Energy Defense-Related Uranium Mines
EPA GIS – Environmental Protection Agency Region 8 Geogrpahical Information

EPA ULD – Environmental Protection Agency Uranium Location Database
MSIC – Mine subsidence information center, Colorado Geological Survey
NPS – National Park Service
OAHP – Office of Archaeology and Historic Preservation
OSM e-AMLIS – Office of Surface Mining abandoned mine land online inventory system
USGS – United States Geological Survey Professional Paper 1651 (Animas River Watershed Database)
          and Digital Data Series 73 (central Western Slope)
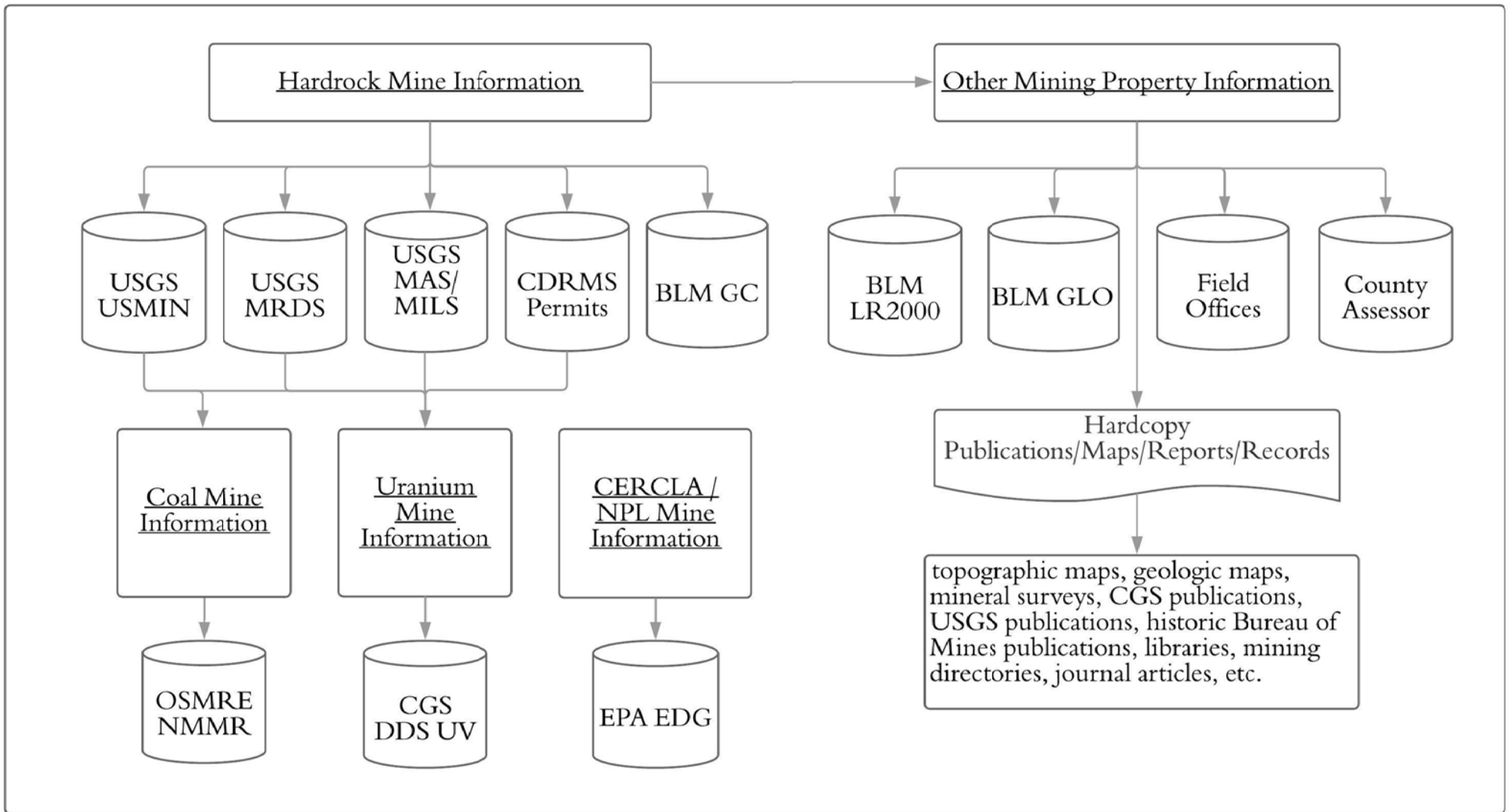
Figure 2 – Other Potential Sources of Mining and/or AML Information

NOTES:
AML – Abandoned Mine Land
BLM GC – Bureau of Land Management Geocommunicator
BLM GLO – Bureau of Land Management General Land Office
BLM LR2000 – Bureau of Land Management Legacy Rehost 2000
CDRMS – Colorado Division of Reclamation, Mining, and Safety
CGS DDS UV – Colorado Geological Survey Digital Data Service
Uranium/Vanadium

EPA EDG – Environmental Protection Agency Environmental Data Gateway
MAS/MILS – Mineral Availabilty System / Mineral Industry Location System
MRDS – Mineral Resources Data System
USGS – United States Geological Survey
USMIN – U.S. Mineral Resource Database (includes topographic map mine-related features)
OSMRE NMMR – Office of Surface Management, Reclamation and Enforcement National Map
Repository
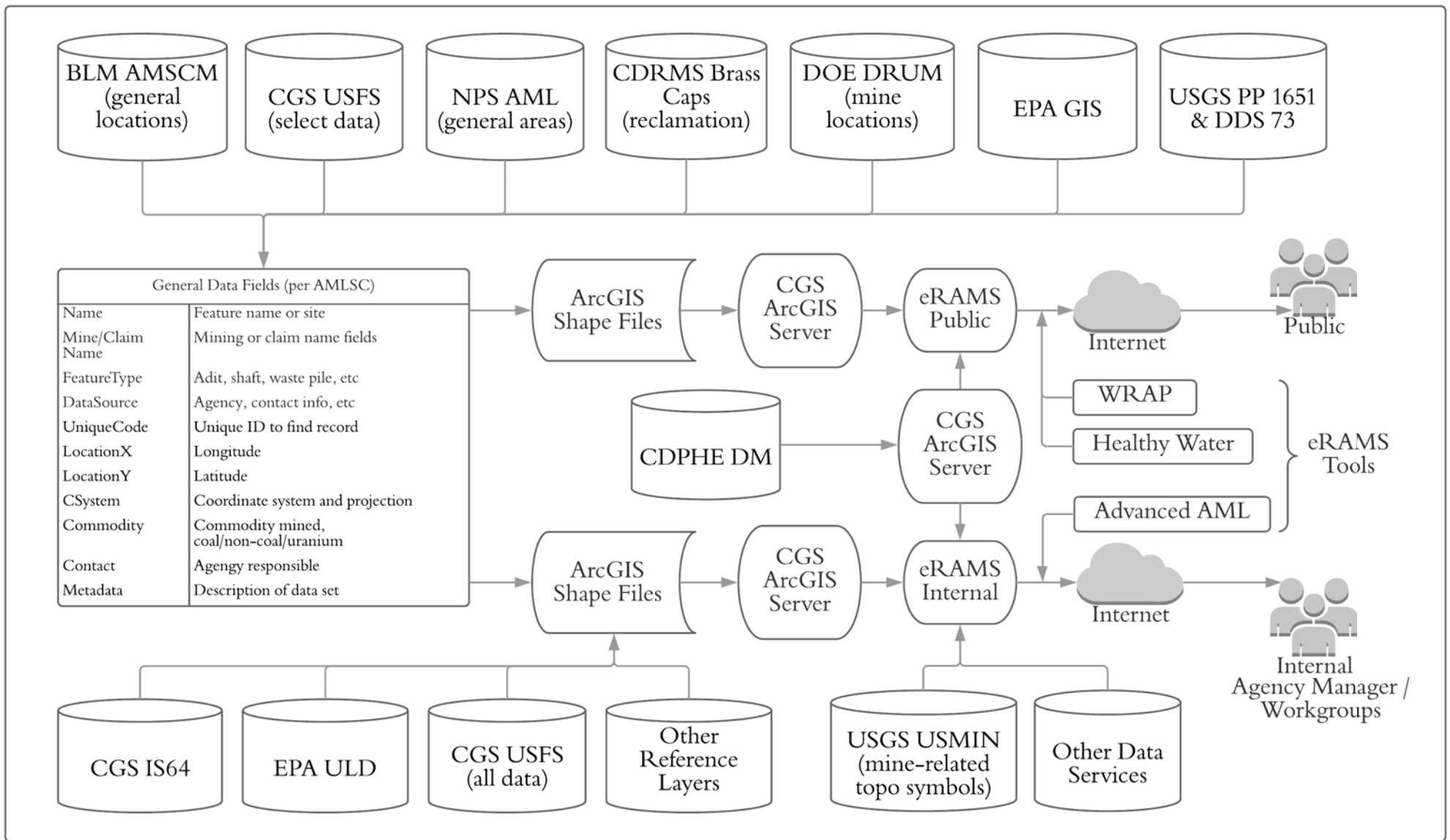
Figure 3 – General AML Information Hub Structure and Data Flow Diagram

NOTES:
AML – Abandoned Mine Land
AMLSC – Abandoned Mine Land Steering Committee
ArcGIS – ESRI ArcGIS
BLM AMSCM – Bureau of Land Management Abandoned Mine Site Cleanup Module
CDPHE DM – Colorado Department of Public Health and Environment Draining Mine Water Quality Study
CDRMS – Colorado Division of Reclamation, Mining, and Safety
CGS – Colorado Geological Survey
CGS IS64 – Colorado Geological Survey Information Series 64
DOE DRUM – Department of Energy Defense-Related Uranium Mines

EPA GIS – Environmental Protection Agency Region 8 Geographical Information Systems
EPA ULD – Environmental Protection Agency Uranium Location Database
eRAMS – Risk Assessment and Management System – Colorado State University
Healthy Water – Heathly Watershed Tool
NPS – National Park Service
PP / DDS – Professional Paper / Digital Data Series
USFS – United States Forest Service
USGS – U.S. Geological Survey
USMIN – U.S. Mineral Resource Database
WRAP – Watershed Rapid Assessment Protocol Tool
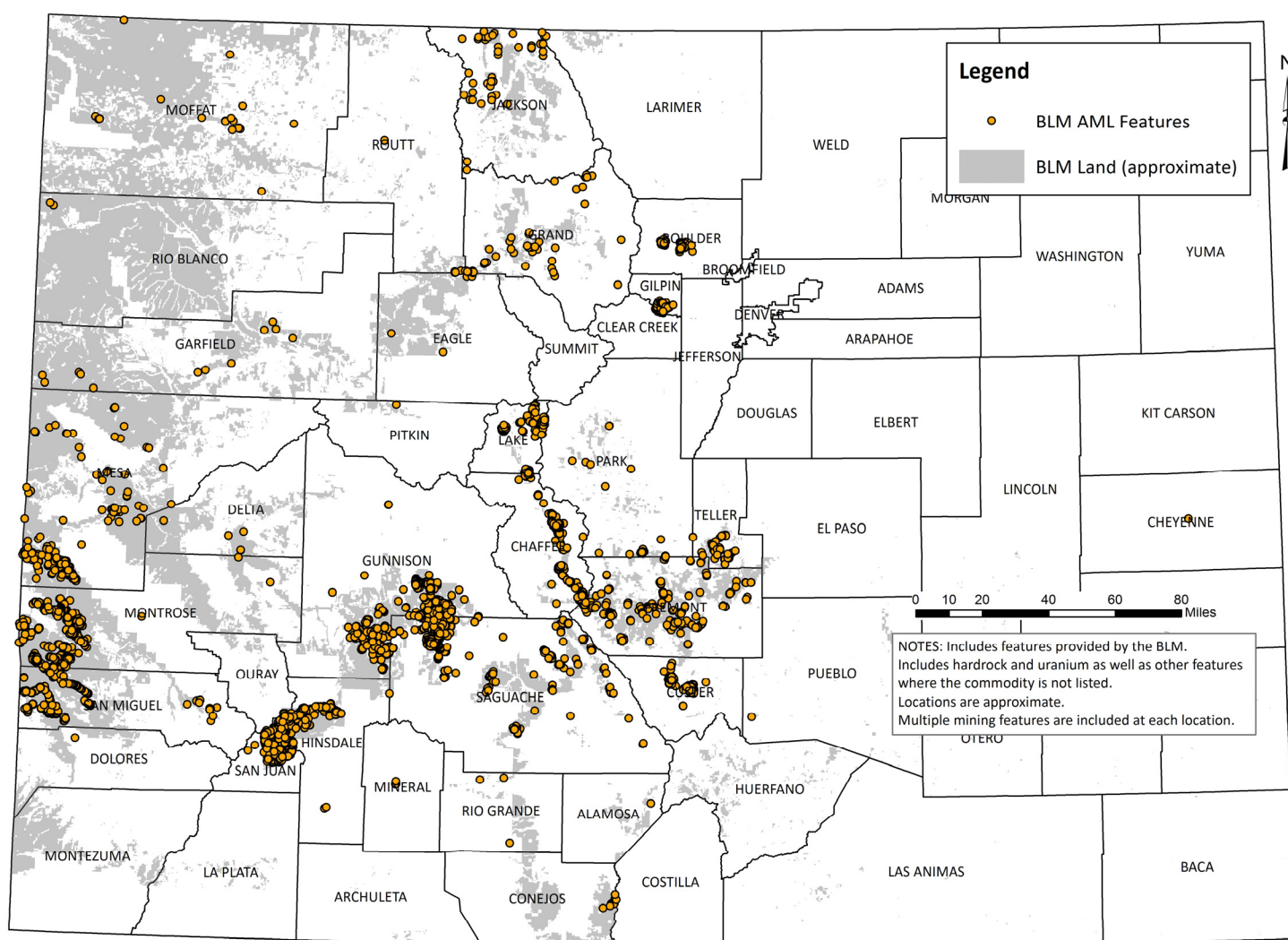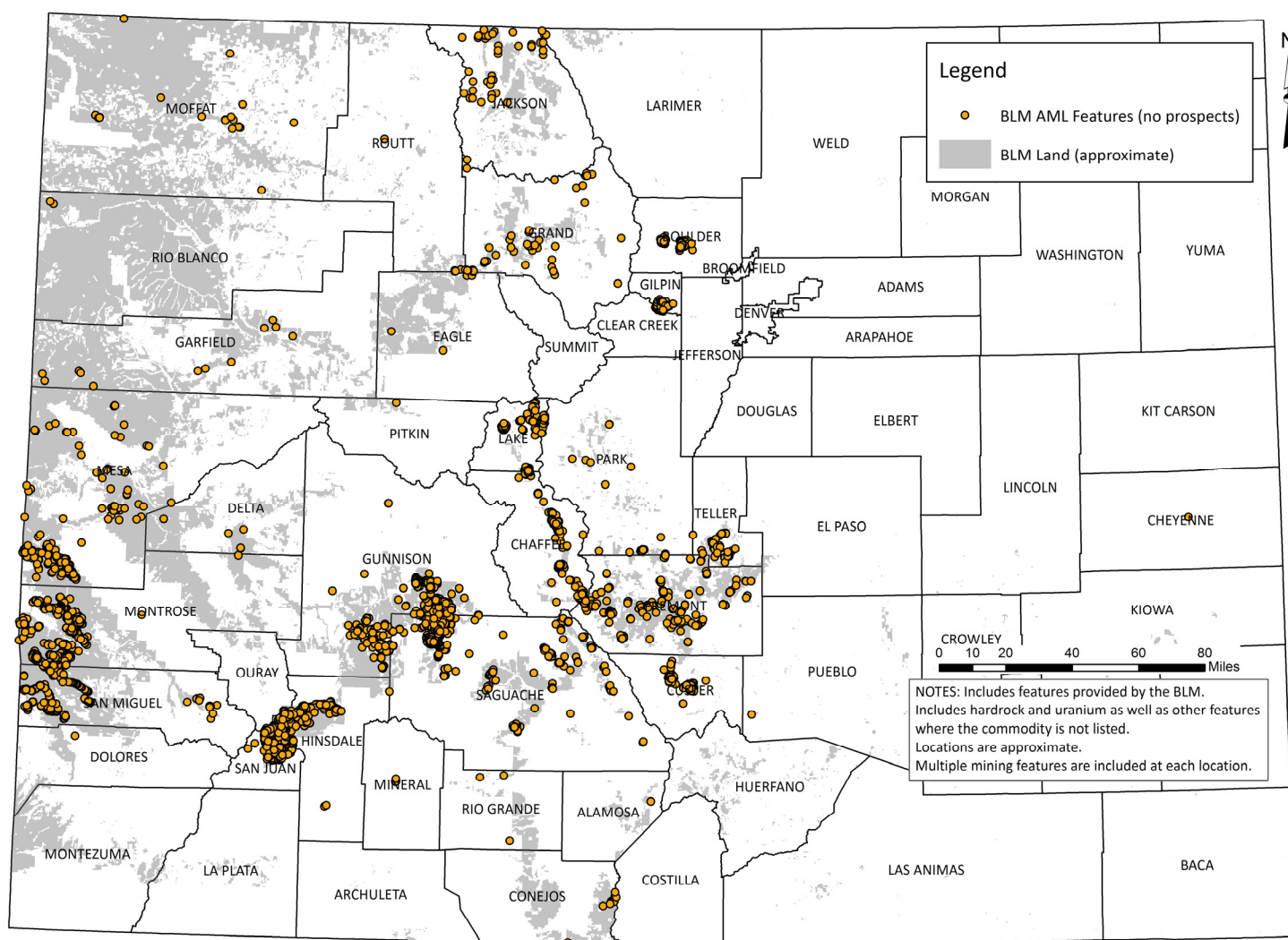
Figure 4 – BLM AML Location Maps. Maps show BLM AML hardrock and uranium features (other commodity types were not included). Top: All AML locations. Bottom: AML locations excluding features identified as "prospect pits." Due to unknown commodity and feature types, these maps may show locations that are not related to hardrock mines, uranium mines, and may also include additional prospect pits, etc. Note: Maps look similar because, in many instances, the data submitted has multiple features at one location.
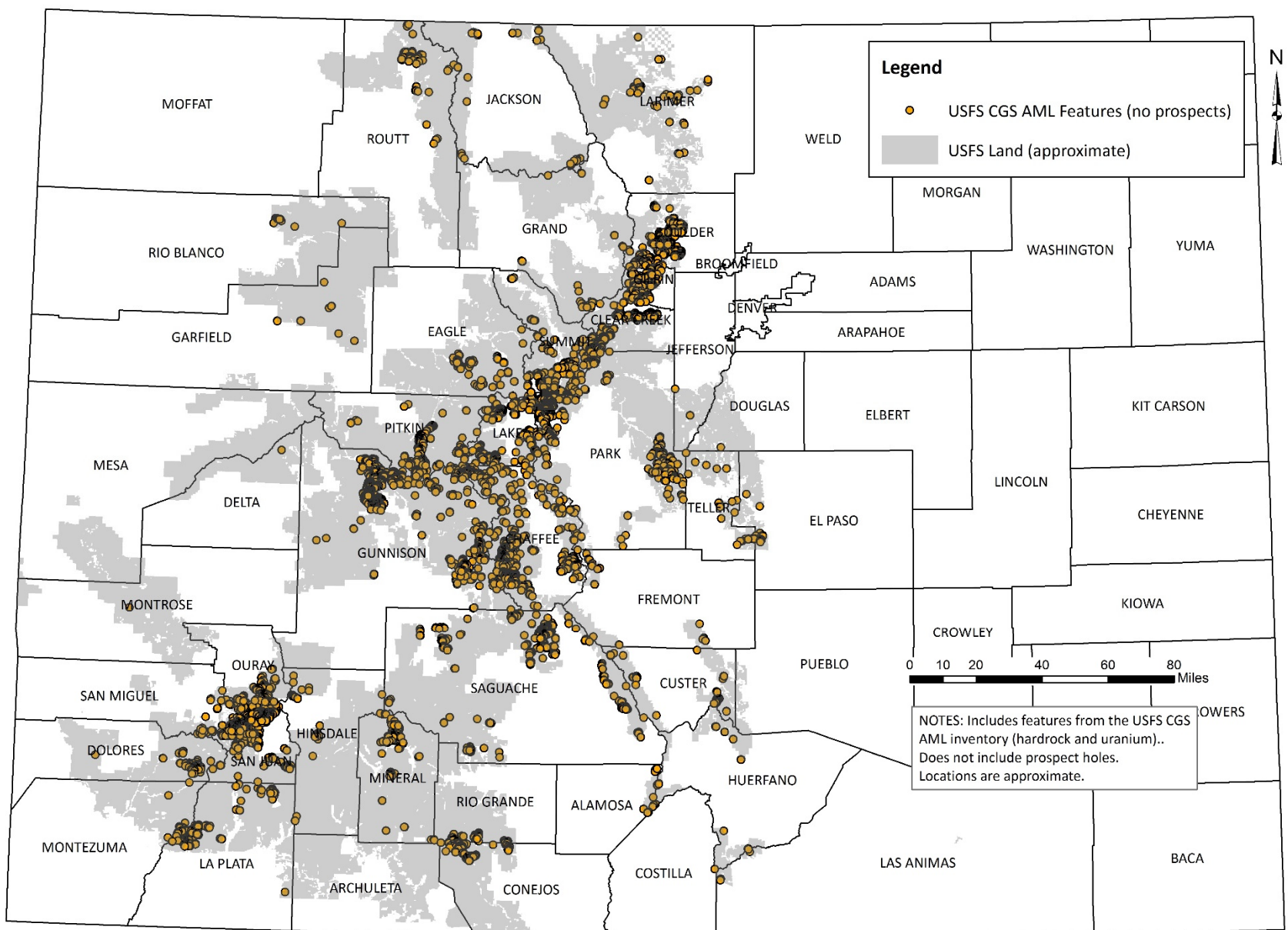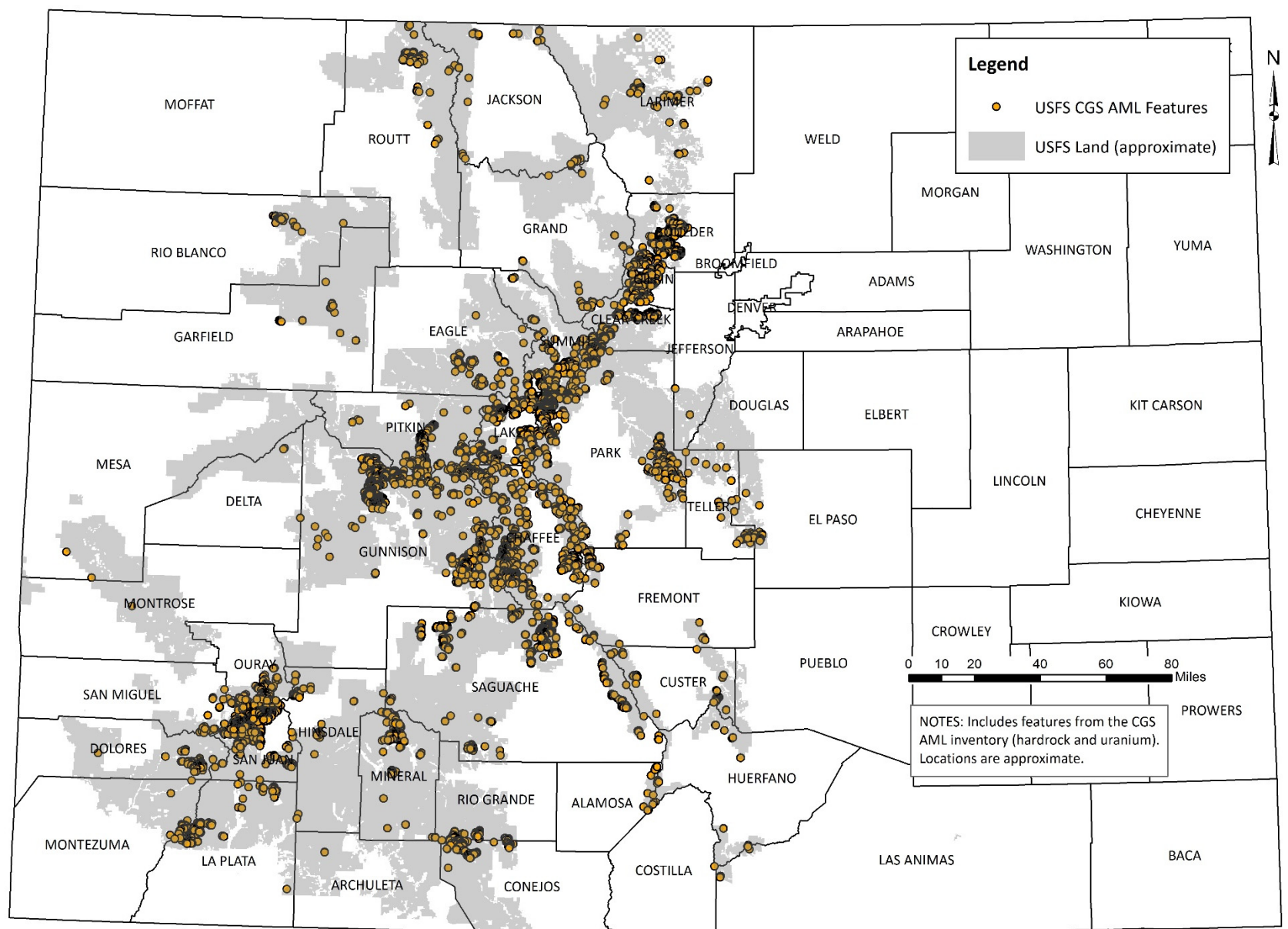
Figure 5 – USFS CGS AML Feature Location Maps. Maps show USFS CGS AML hardrock and uranium features (other commodity types were not included). Top: All AML locations. Bottom: AML locations excluding features identified as "prospect holes." Due to unknown commodity and feature types, these maps may show locations that are not related to hardrock mines, uranium mines, and may also include additional prospect pits, etc.
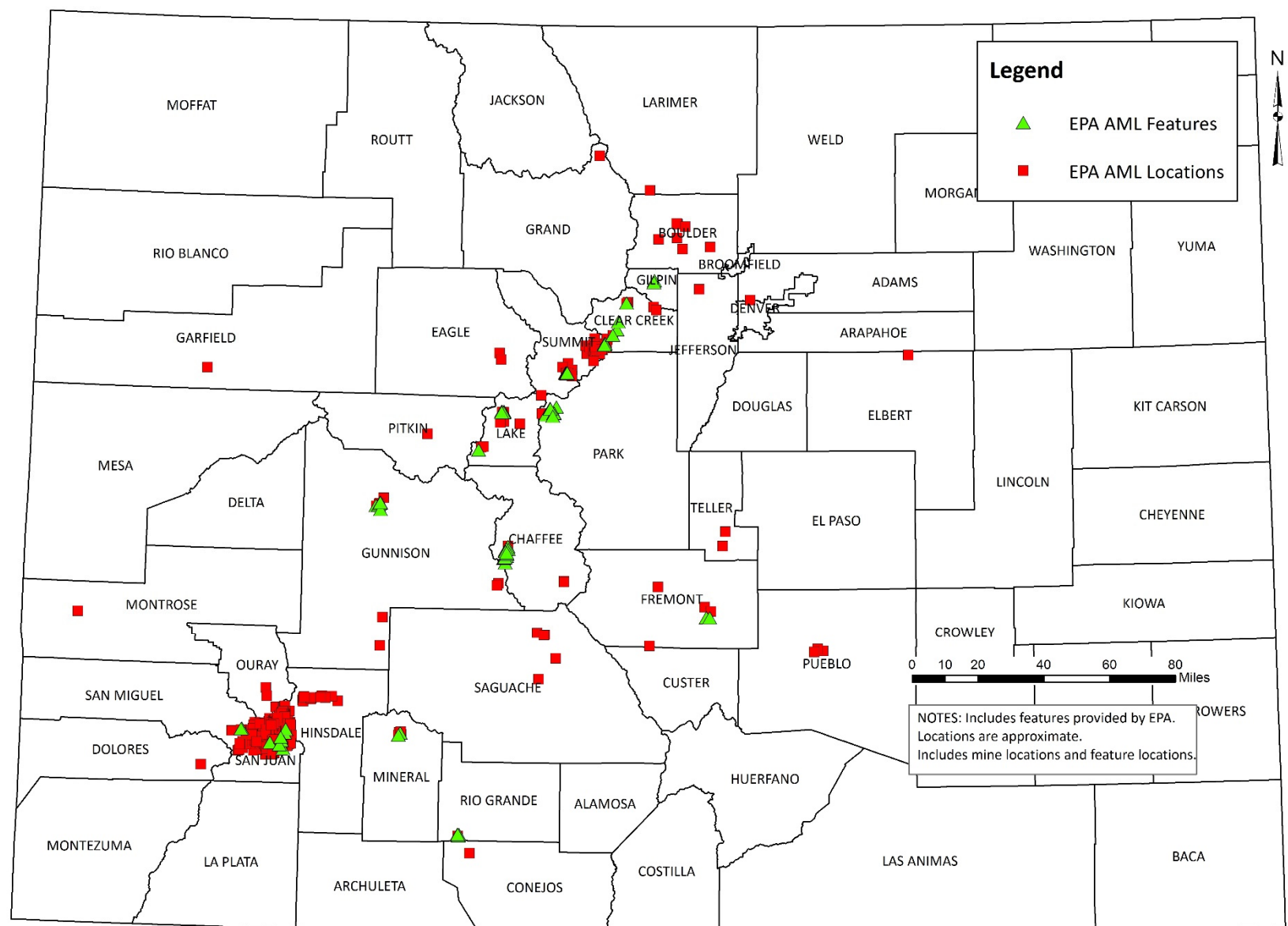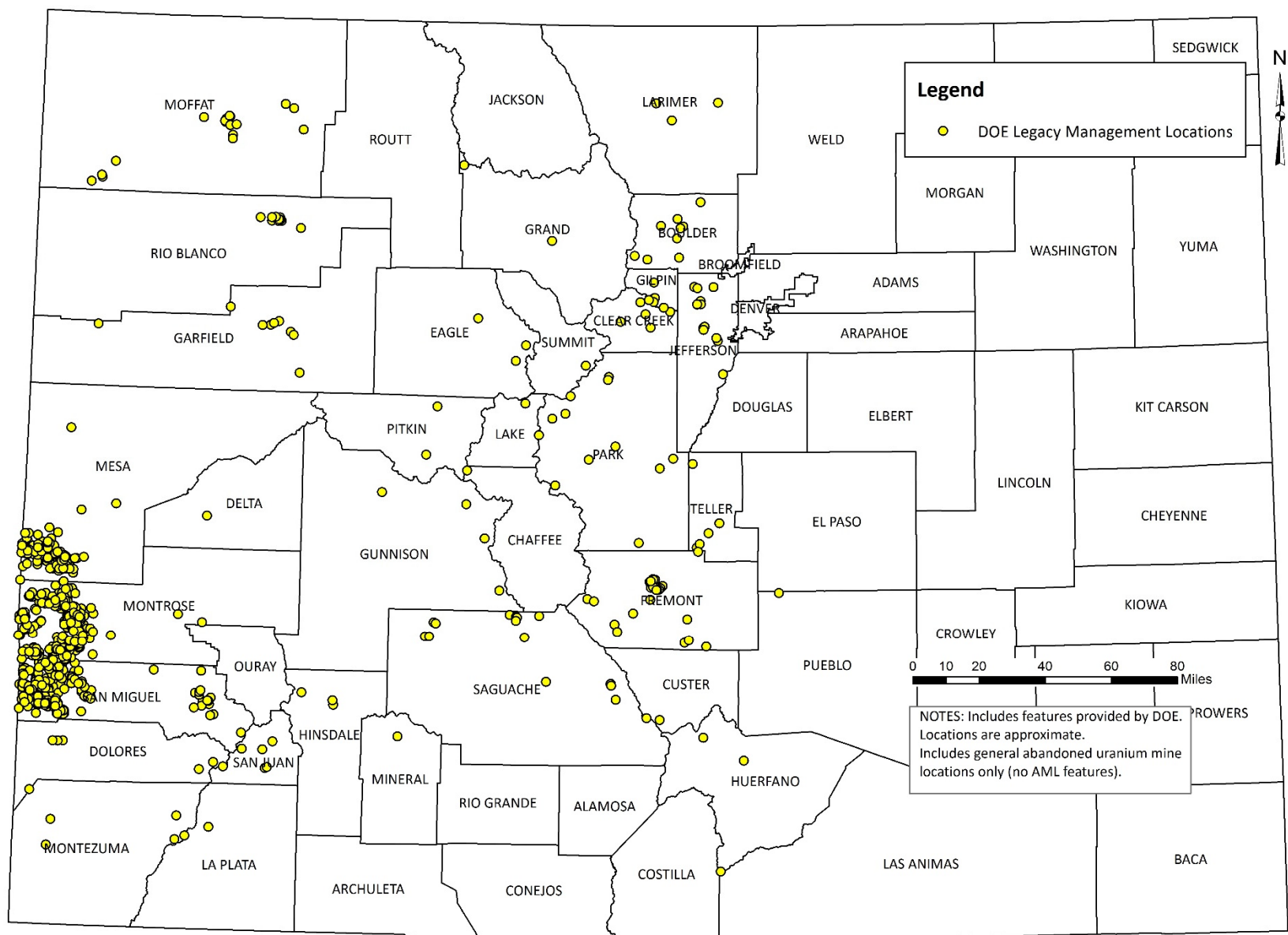
Figure 6 – DOE and EPA AML Location Maps. Top: DOE LM AML locations (mines only). Bottom: EPA Region 8 AML locations.
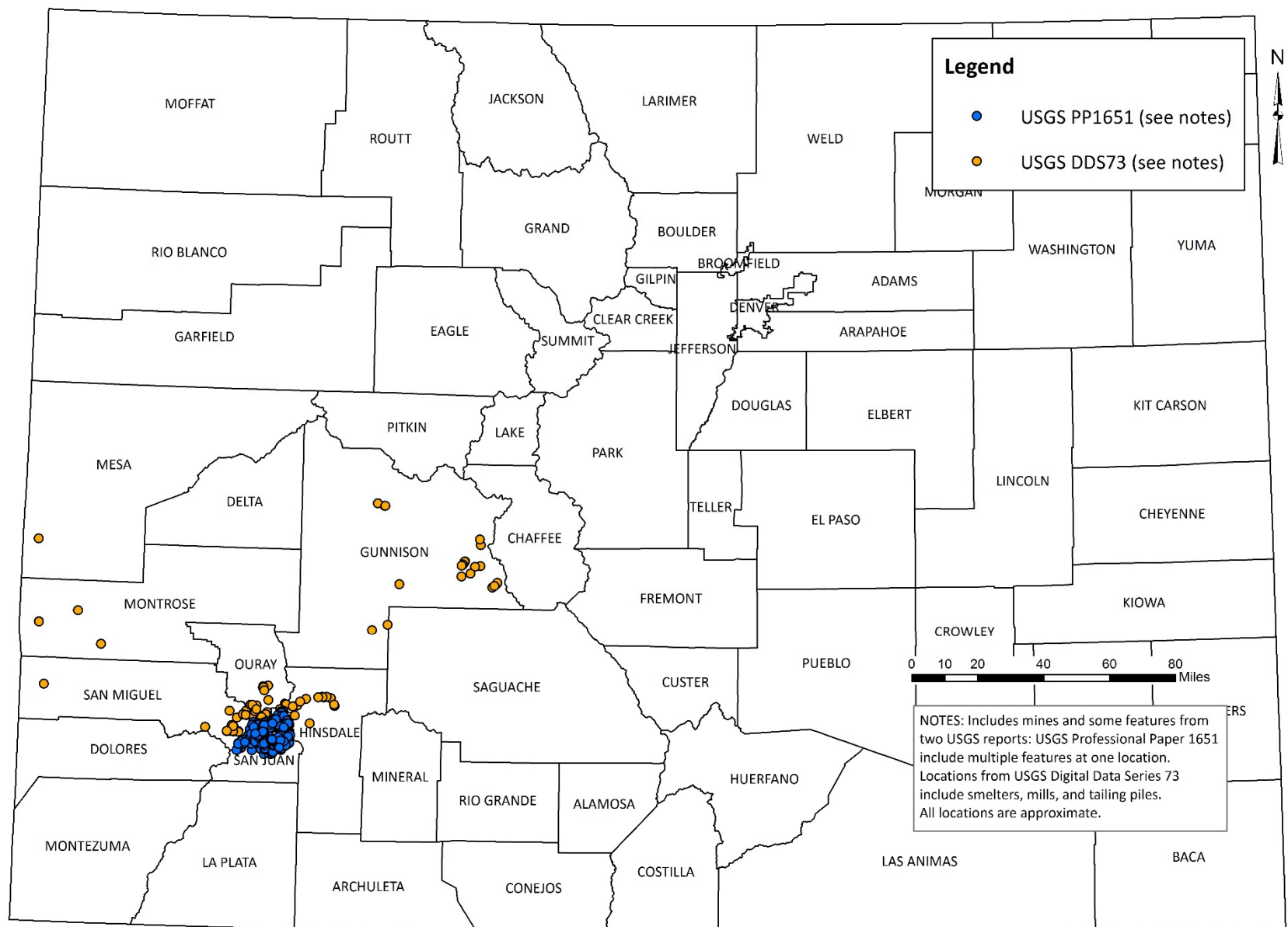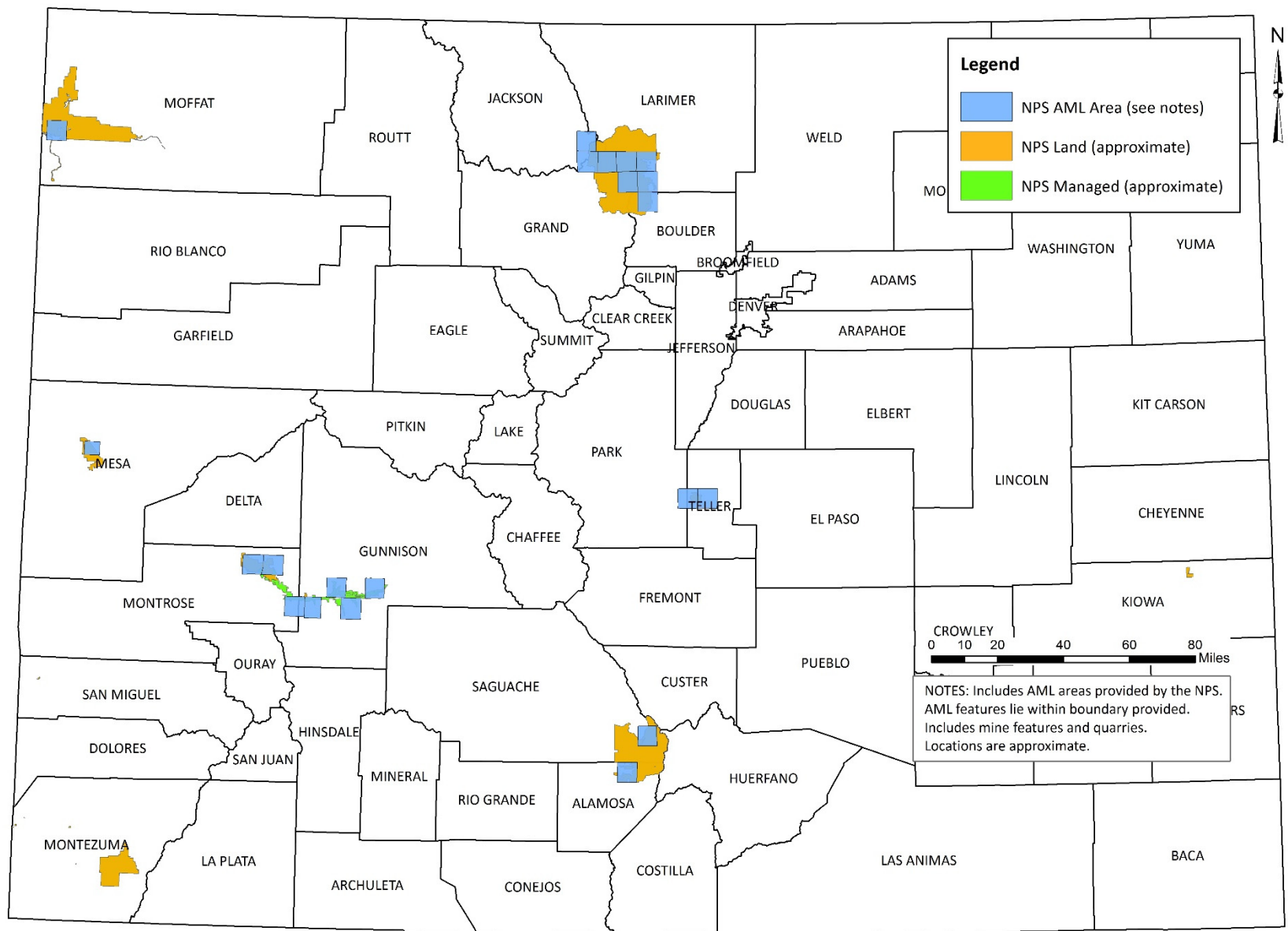
Figure 7 – NPS and USGS AML Location Maps. Top: NPS general AML feature locations (multiple features within an area). Bottom: Two United States Geological Survey (USGS) published data sets (Nash, 2002; Church and Others, 2007) with AML locations (see notes).
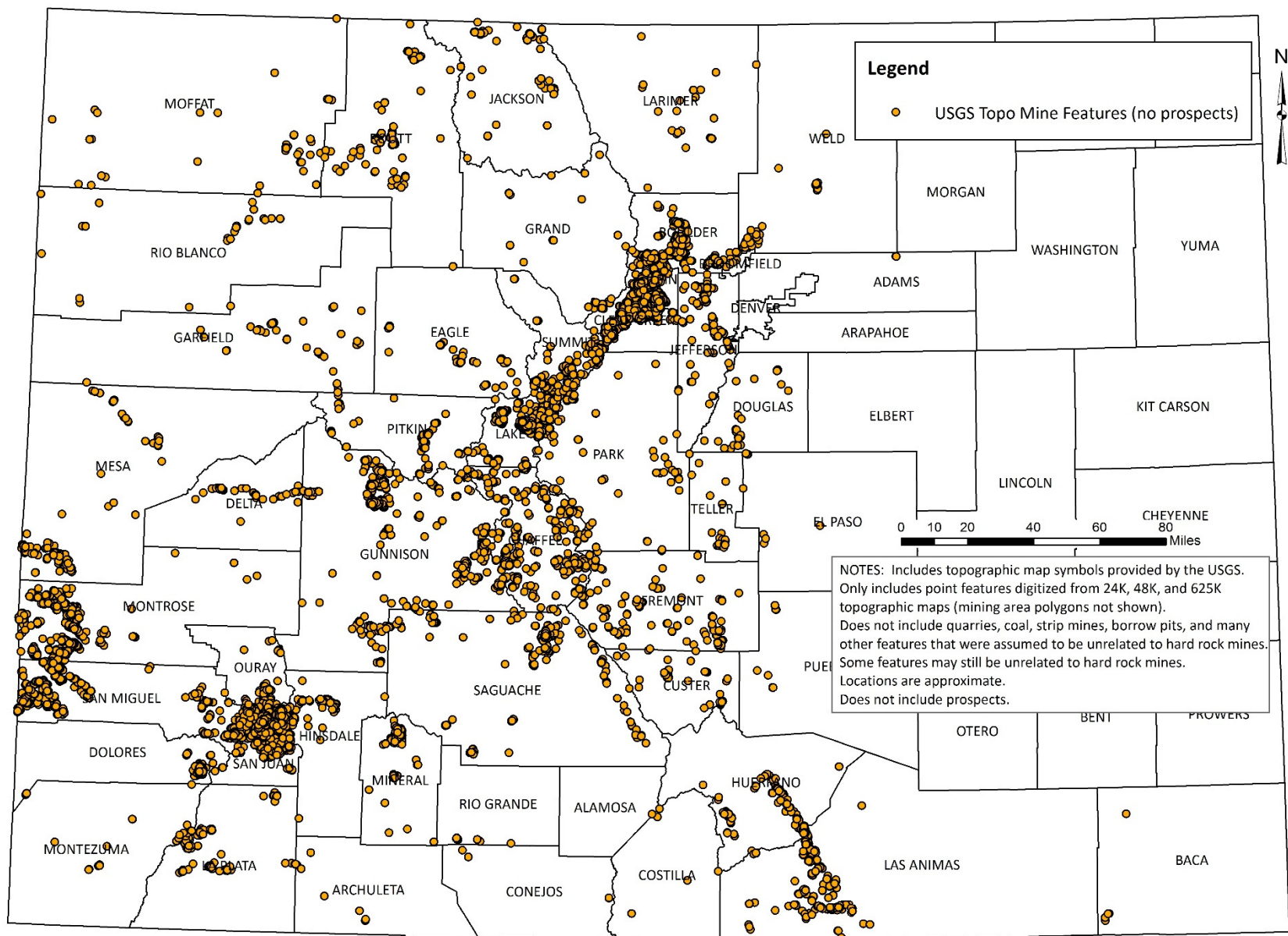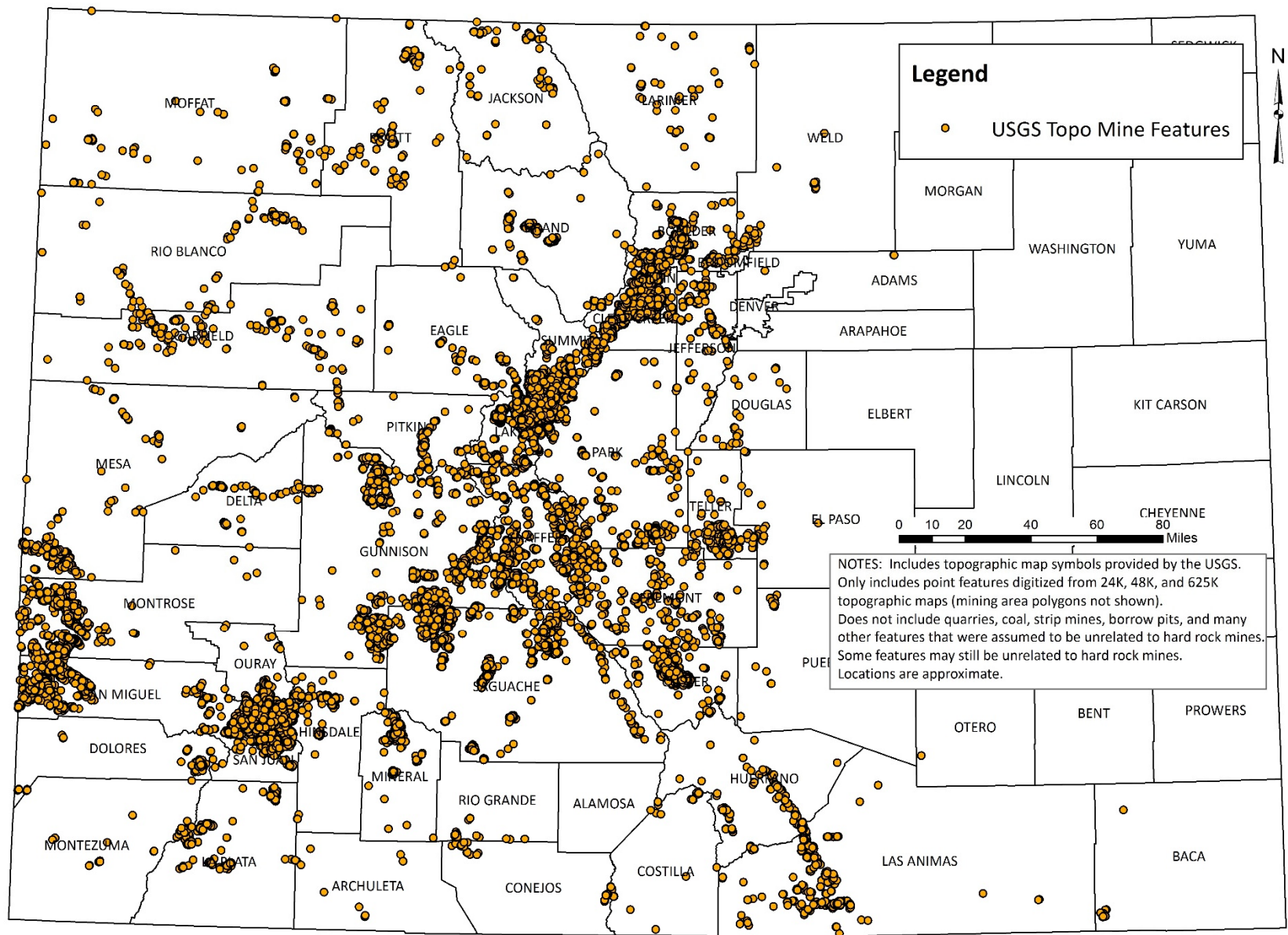
Figure 8 – USGS Topographic Map Prospect- and Mine-Related Feature Maps. Maps show USGS topographic mine symbols (see notes for details) for hardrock and uranium mines (other commodity types were not included) (Horton and San Juan, 2018). Top: All mine related locations. Bottom: Mine related features excluding "prospect pits." Due to unknown commodity and feature types, these maps may show locations that are not related to hardrock mines, uranium mines, and may also include additional prospect pits, etc.
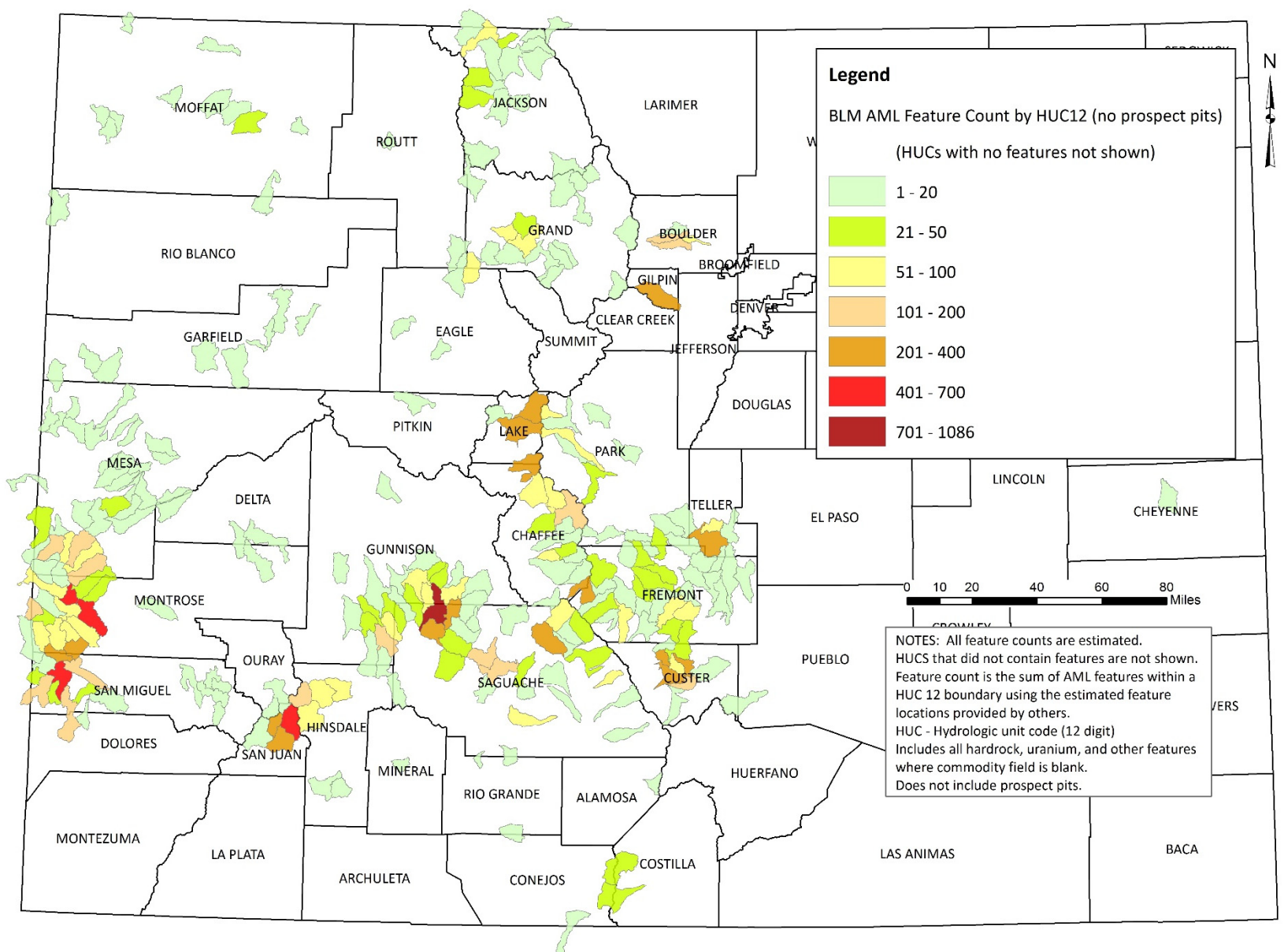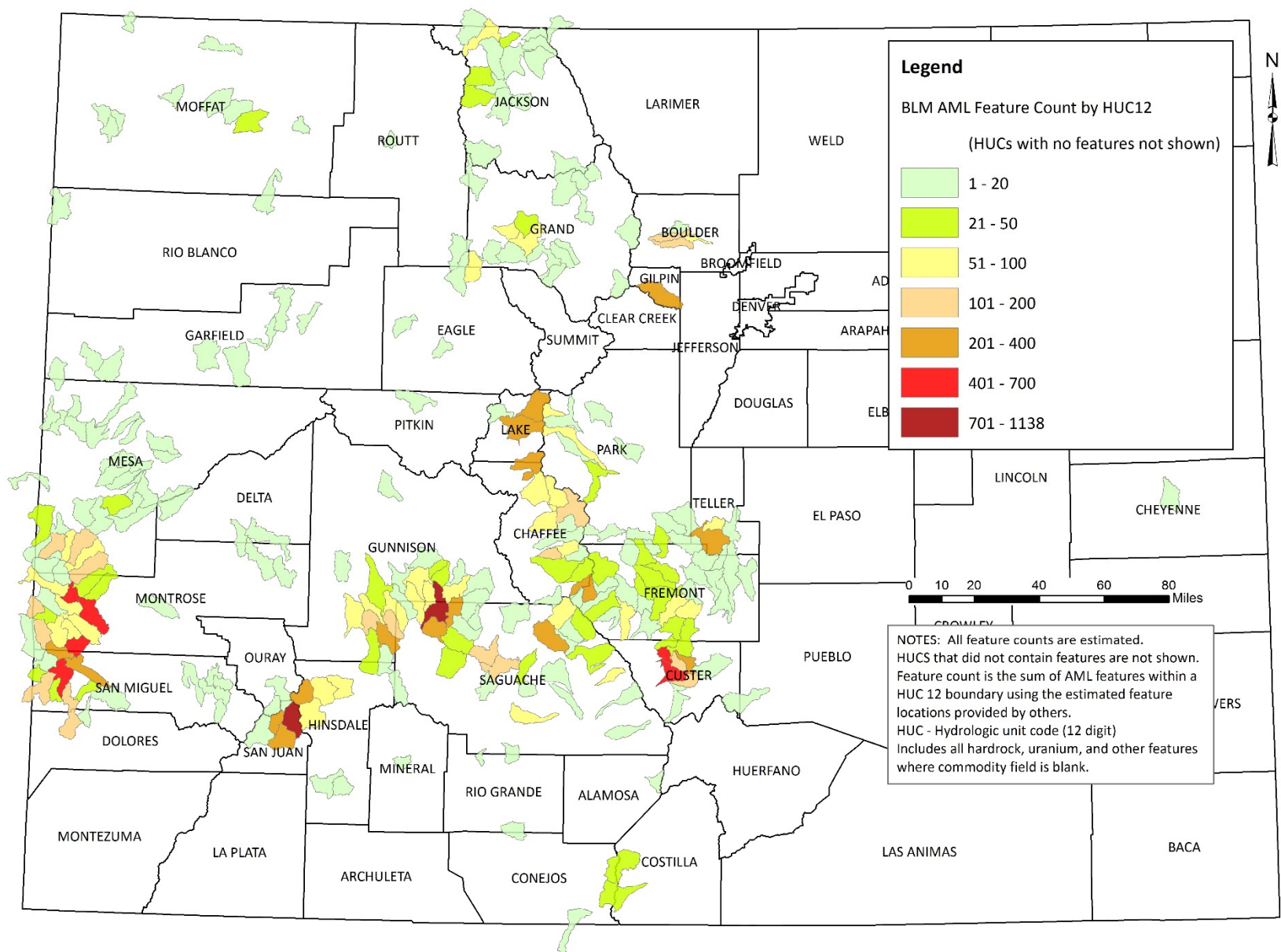
Figure 9 – BLM AML Mine Location Maps Per HUC12. Maps showing the number of BLM AML features in the 12-digit hydrologic unit code (HUC12) areas. HUCs not shown did not contain any features. Top: All BLM AML feature locations. Bottom: All BLM AML feature locations excluding "prospect pits." Due to unknown commodity and feature types, these maps may show locations that are not related to hardrock mines, uranium mines, and may also include additional prospect pits, etc.
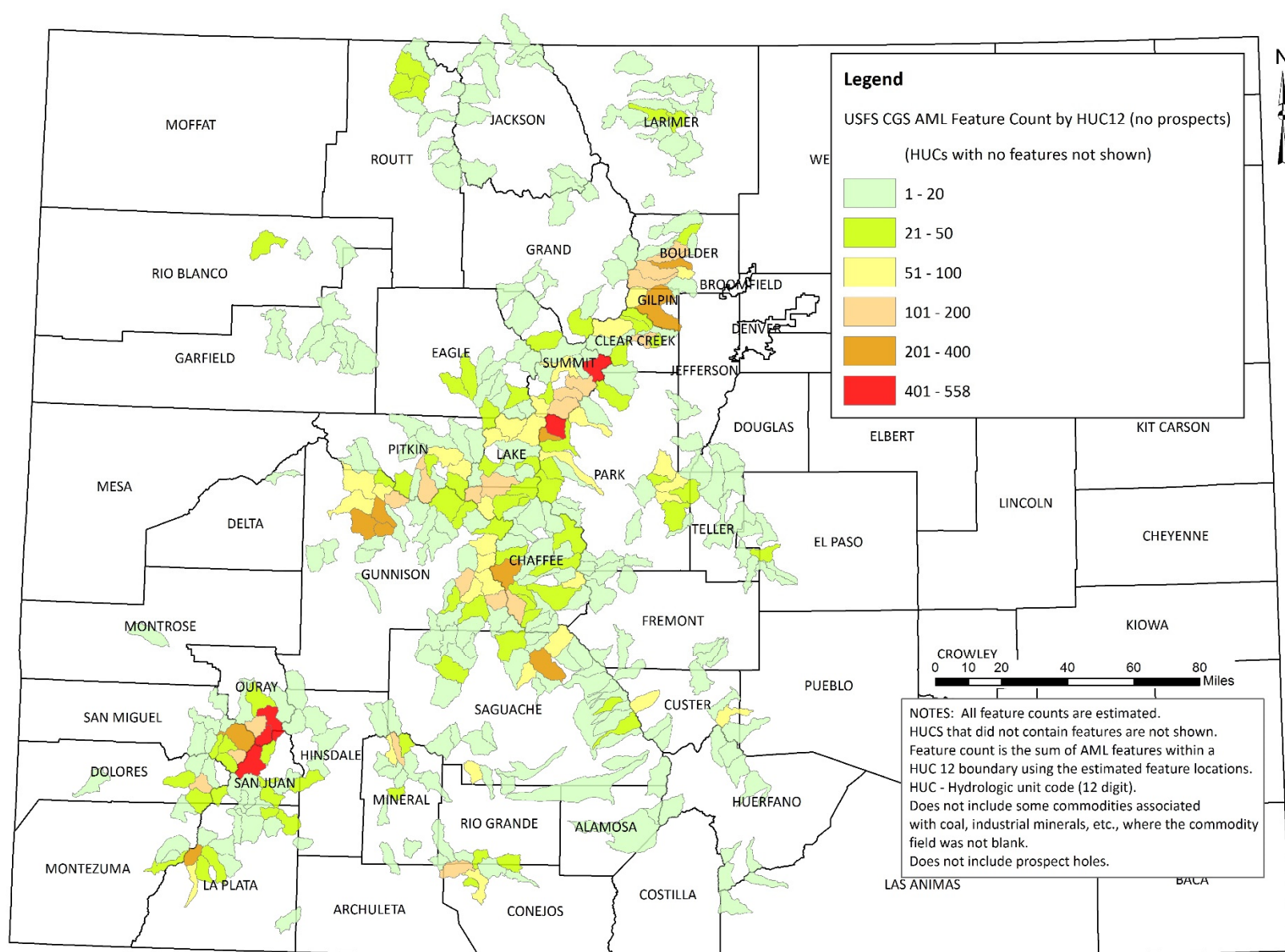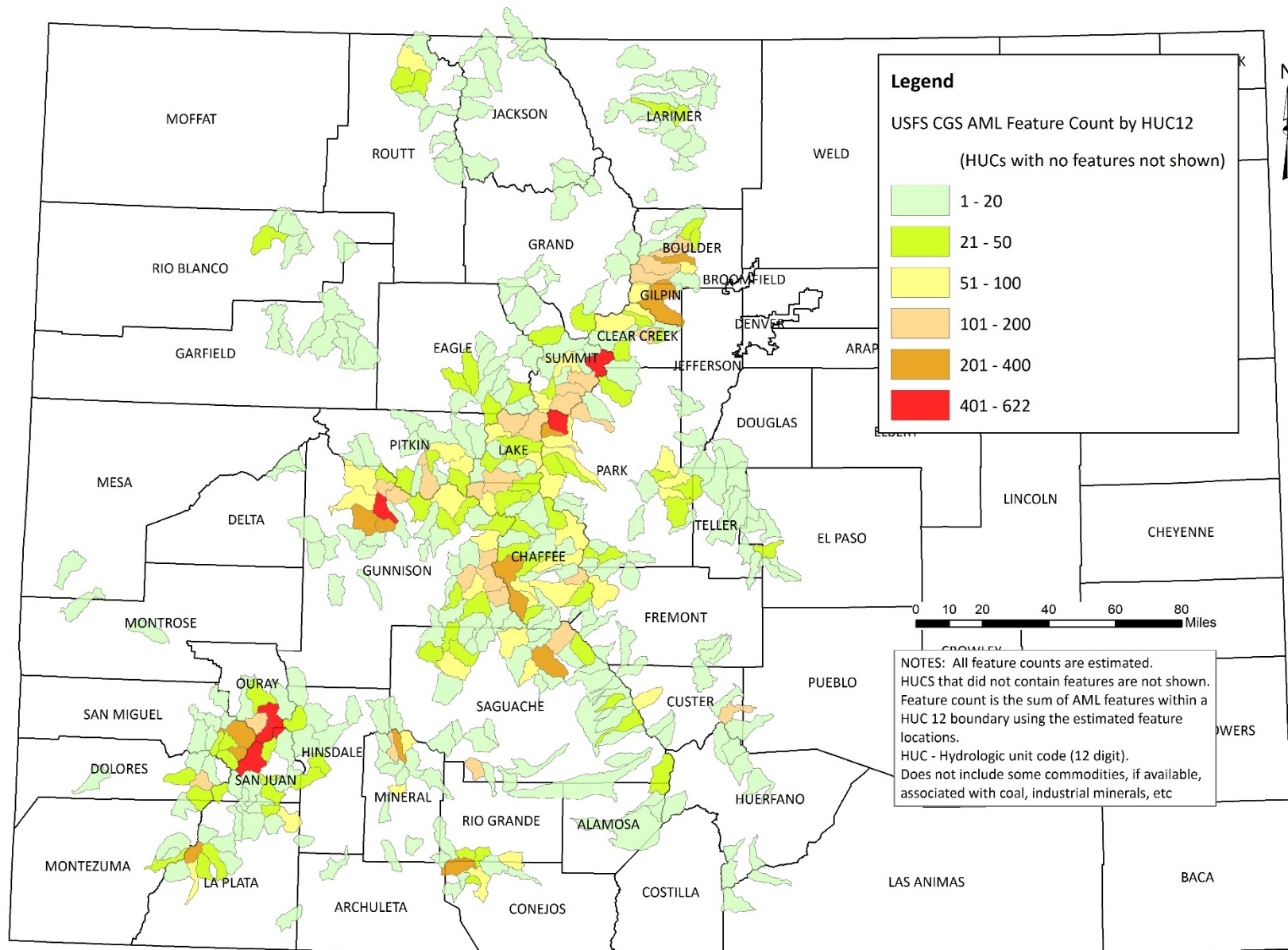
Figure 10 – USFS CGS AML Feature Location Maps Per HUC12. Maps showing the number of USFS CGS hardrock and uranium AML features in the 12-digit hydrologic unit code (HUC) areas. HUCs not shown did not contain any features. Top: All USFS CGS AML feature locations. Bottom: All USFS CGS feature locations excluding "prospect holes." Due to unknown commodity and feature types, these maps may show locations that are not related to hardrock mines, uranium mines, and may also include additional prospect pits, etc.
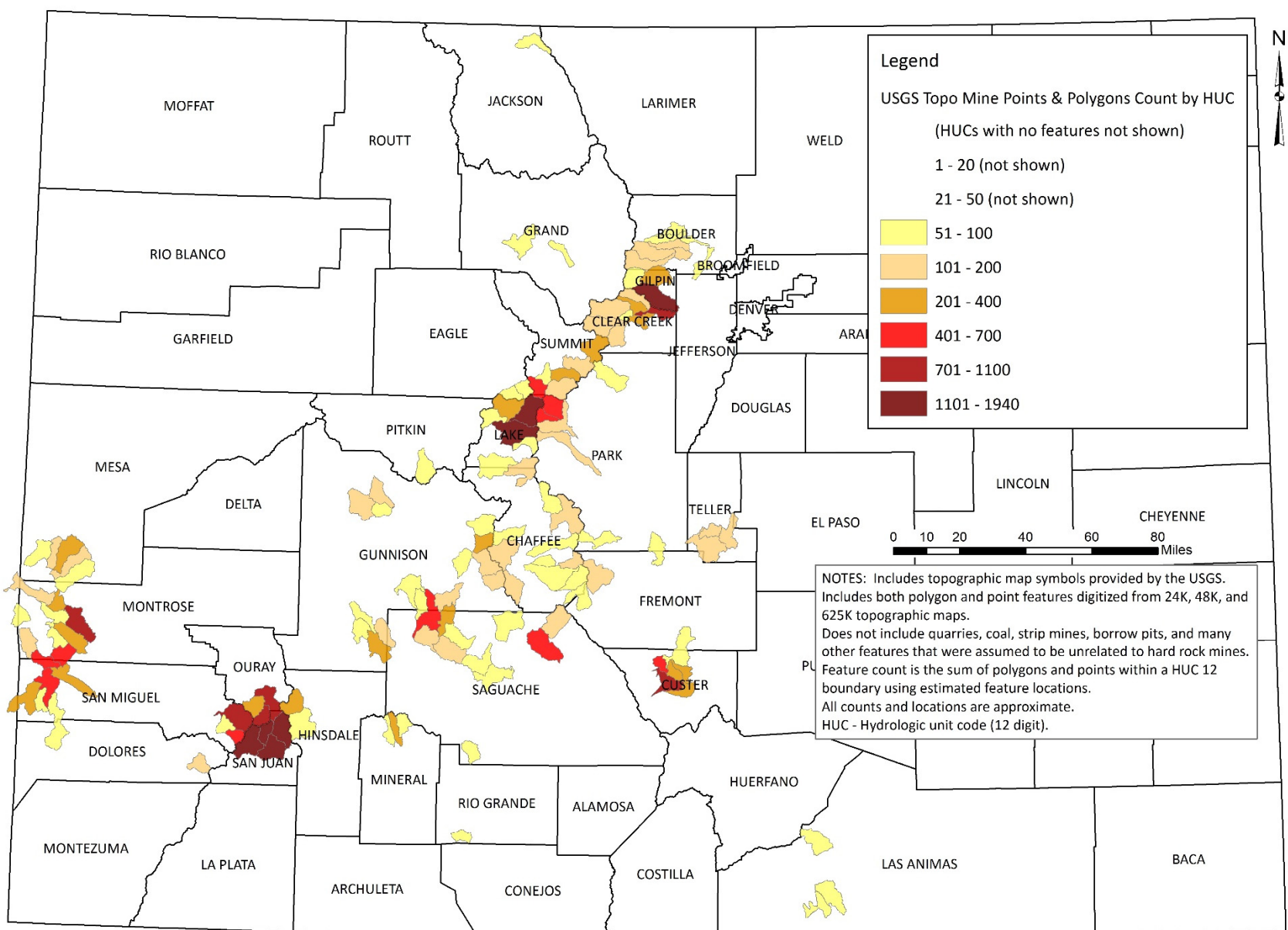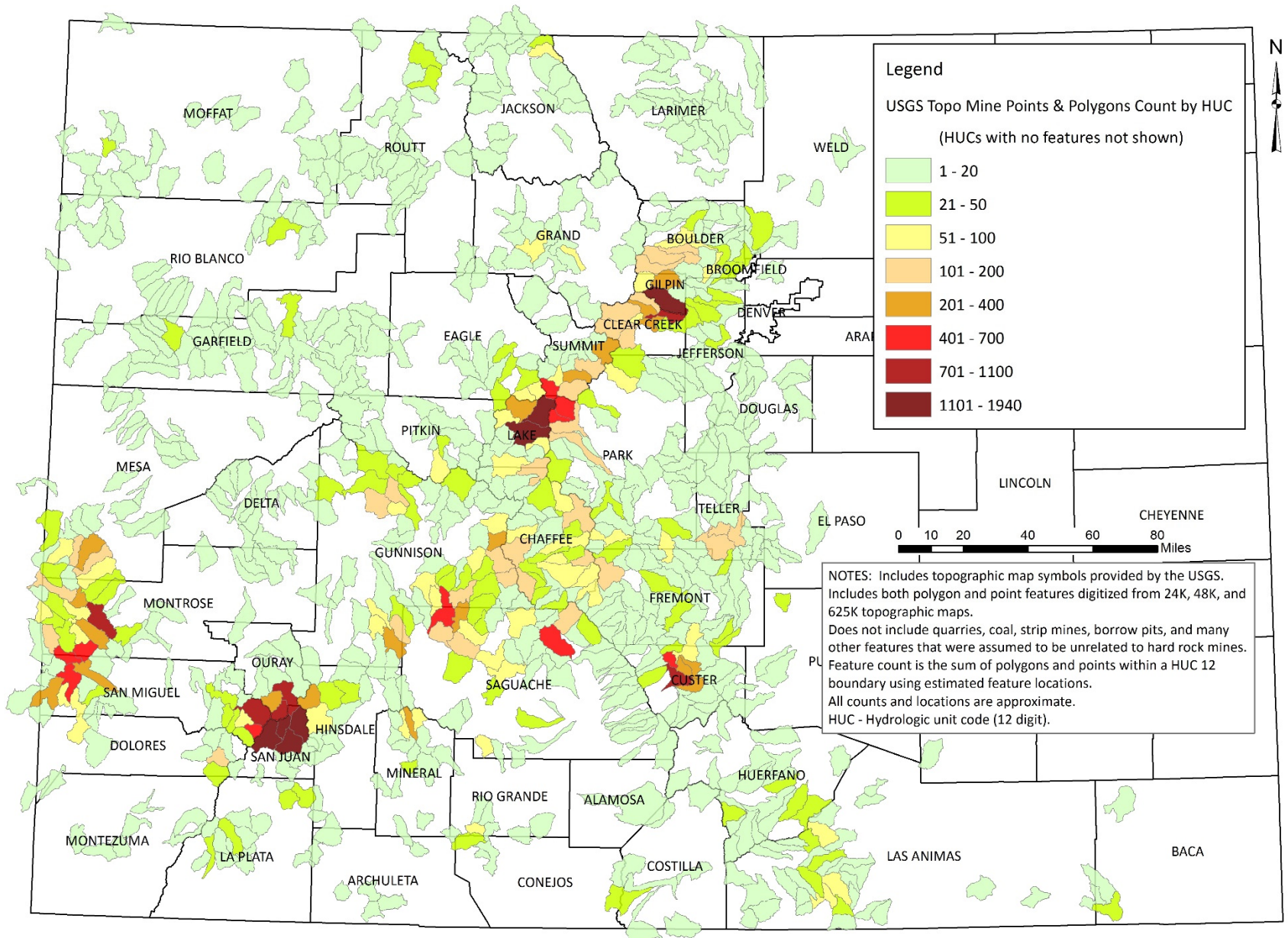
Figure 11 – USGS Prospect- and Mine-Related Feature Location Maps Per HUC12. Feature counts for combined point and polygon files (see notes). Top: Feature symbol count in each HUC12. Bottom: Feature symbol counts over 50 in each HUC12. Due to unknown commodity and feature types, these maps may show locations that are not related to hardrock mines, uranium mines, and may also include additional prospect pits, etc.
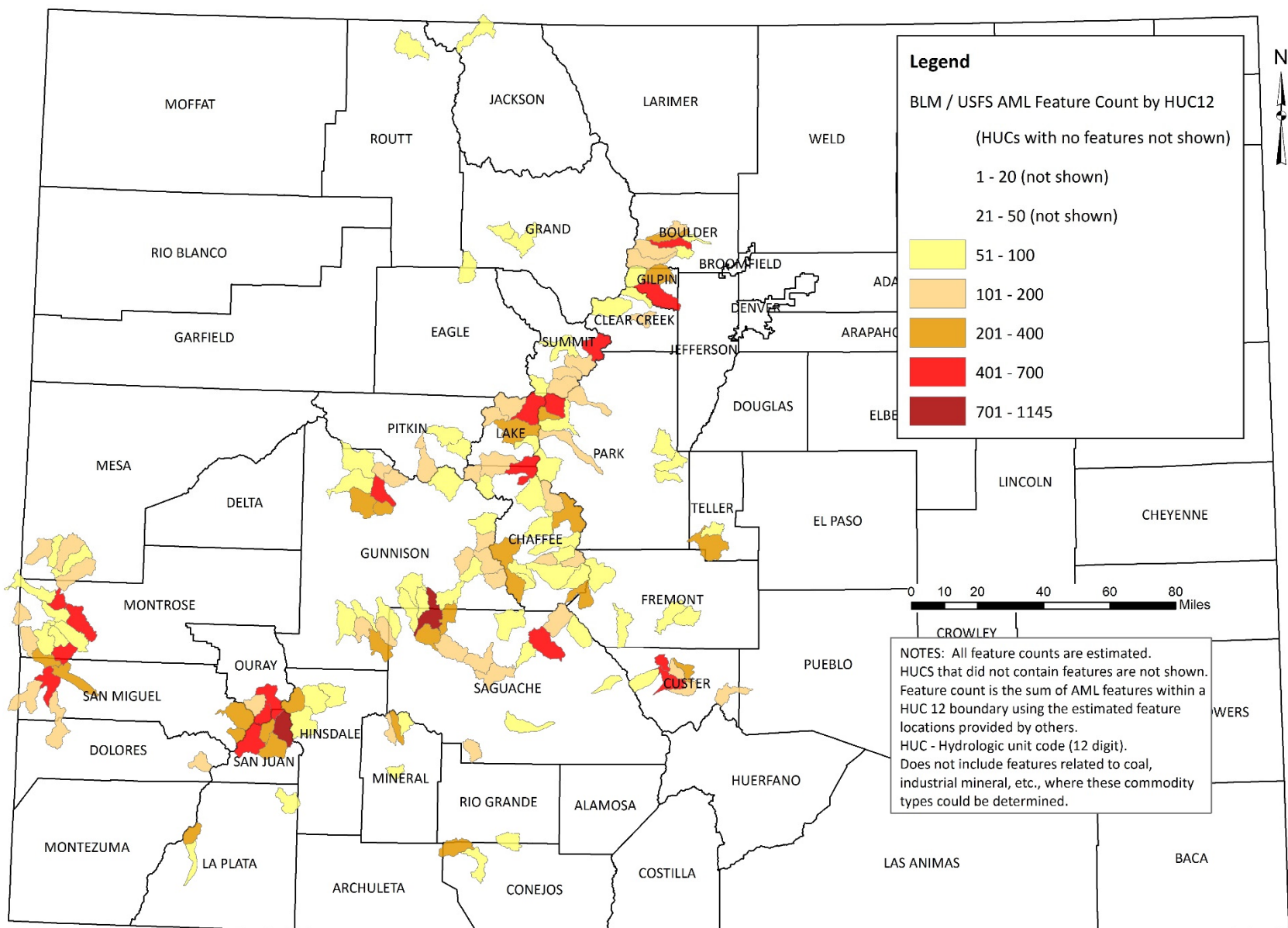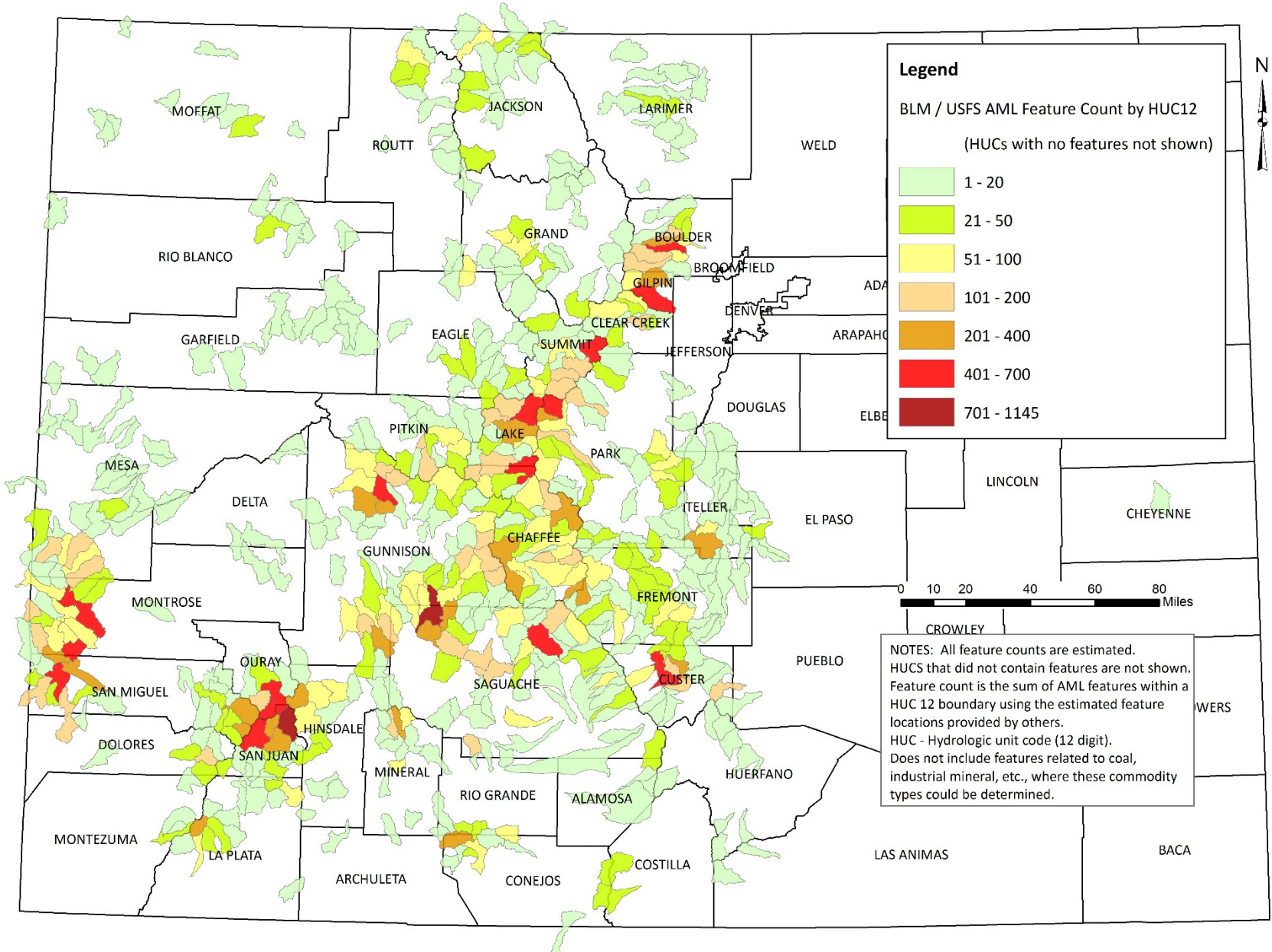
Figure 12 – Combined BLM and USFS CGS AML Feature Location Maps Per HUC12. HUCs not shown did not contain any features. Top: All BLM and USFS CGS AML feature locations. Bottom: HUC12 areas containing over 50 combined BLM and USFS CGS AML feature locations. Due to unknown commodity and feature types, these maps may show locations that are not related to hardrock mines, uranium mines, and may also include additional prospect pits, etc.
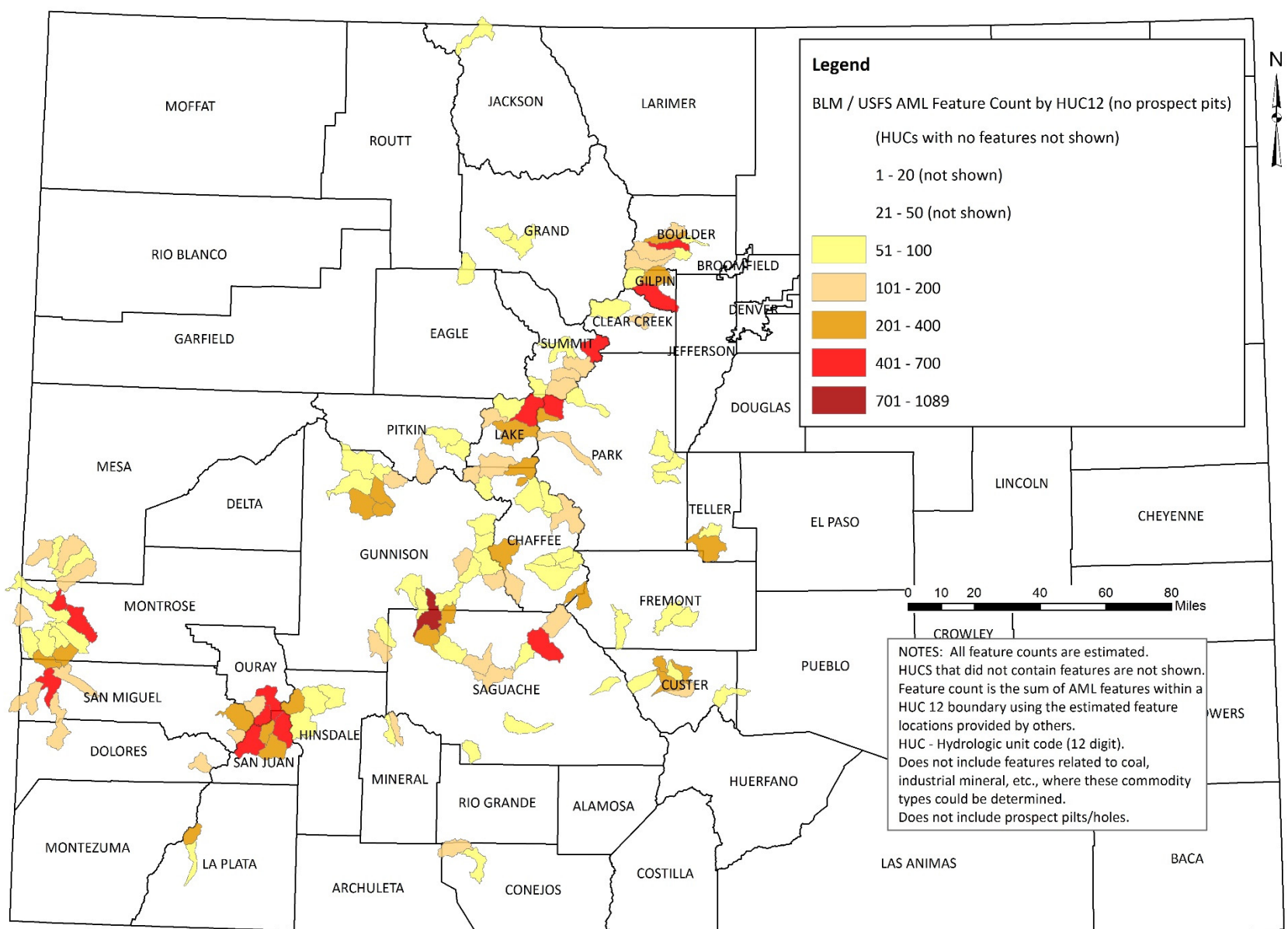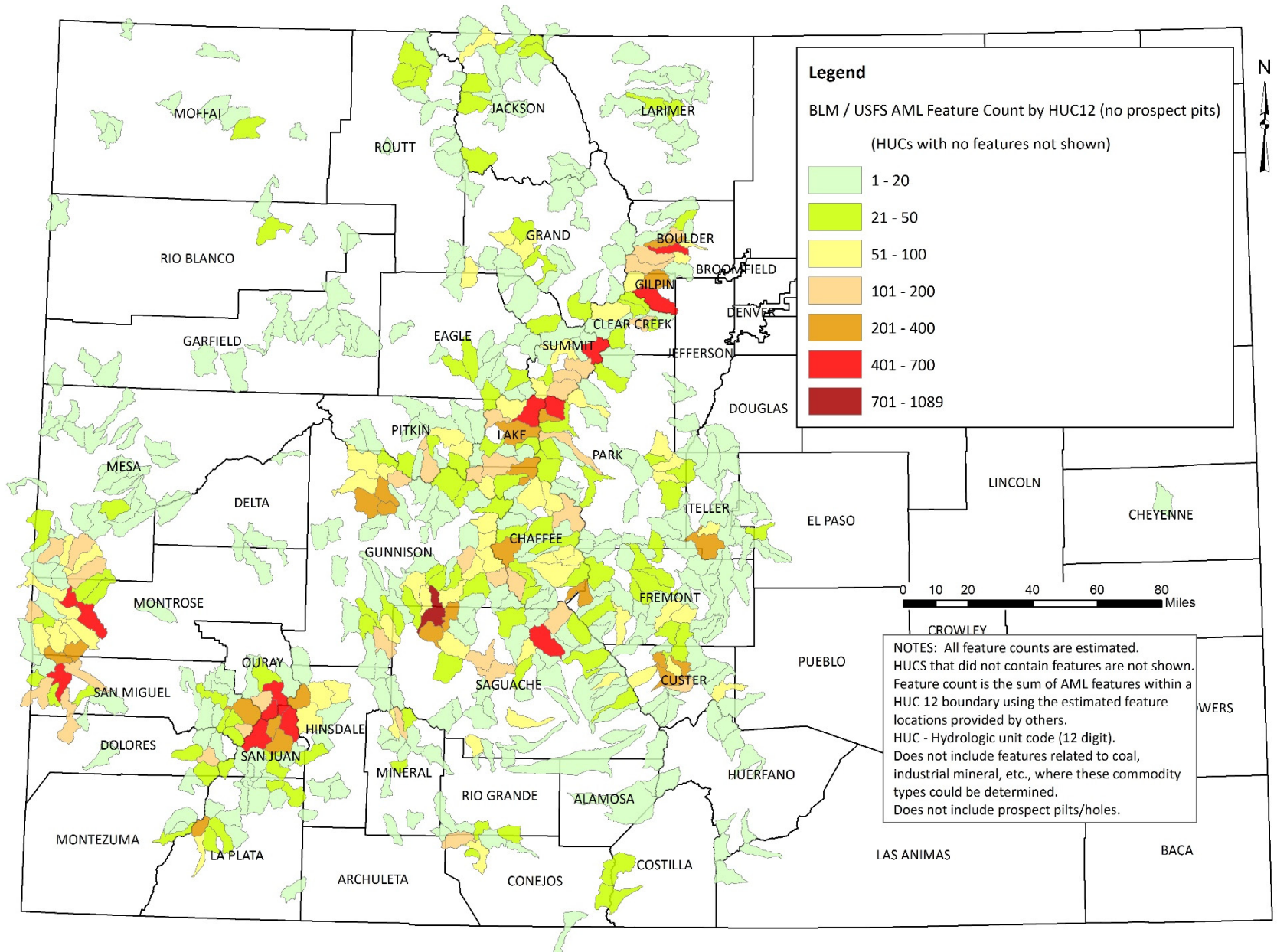
Figure 13 – Combined BLM and USFS CGS AML Feature Location Maps Per HUC12 Without Prospects.   HUCs not shown did not contain any features. Top: All BLM and USFS CGS AML feature locations (no prospects). Bottom: HUC12 areas containing over 50 combined BLM and USFS CGS AML feature locations (no prospects). Due to unknown commodity and feature types, these maps may show locations that are not related to hardrock mines, uranium mines, and may also include additional prospect pits, etc.
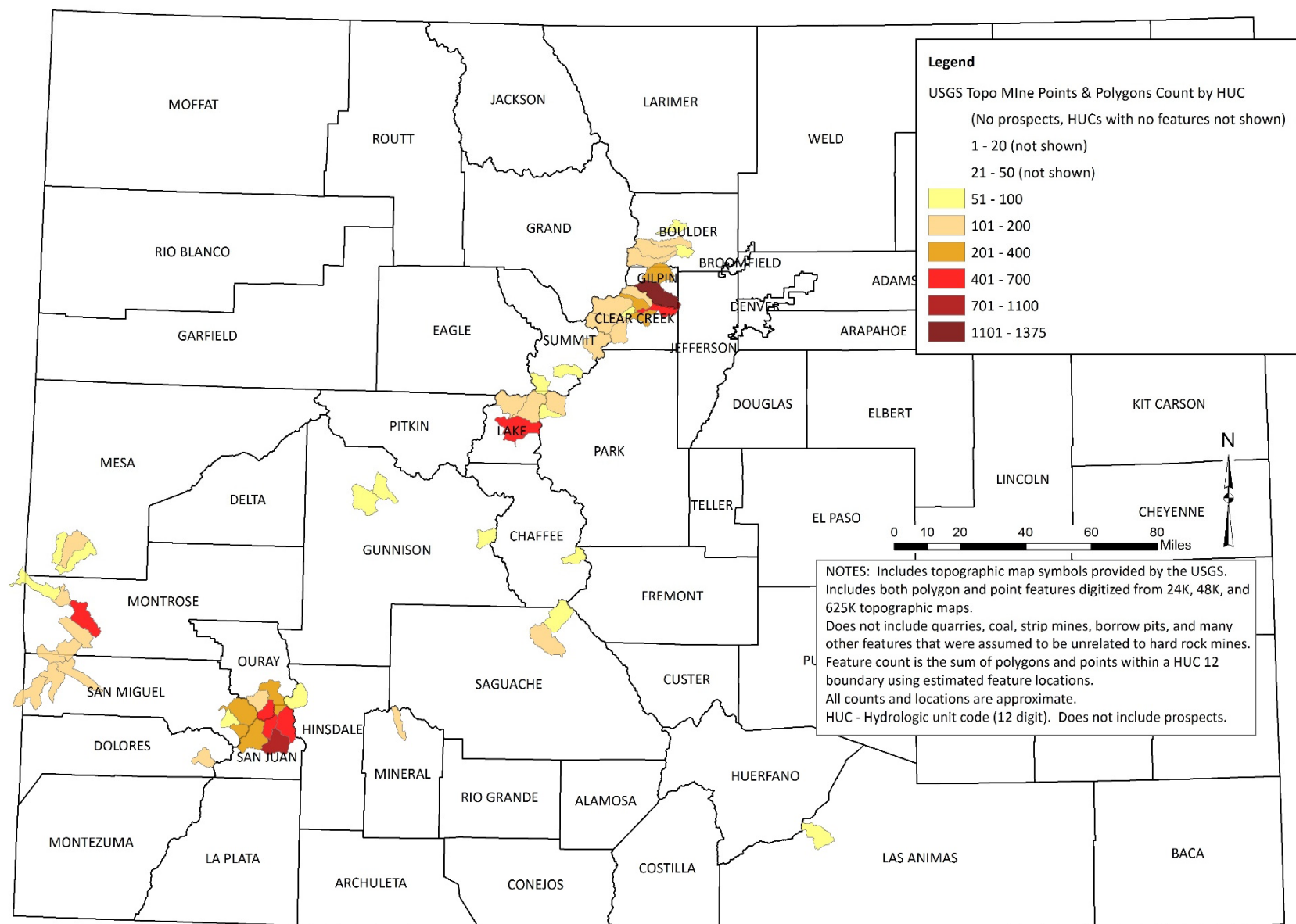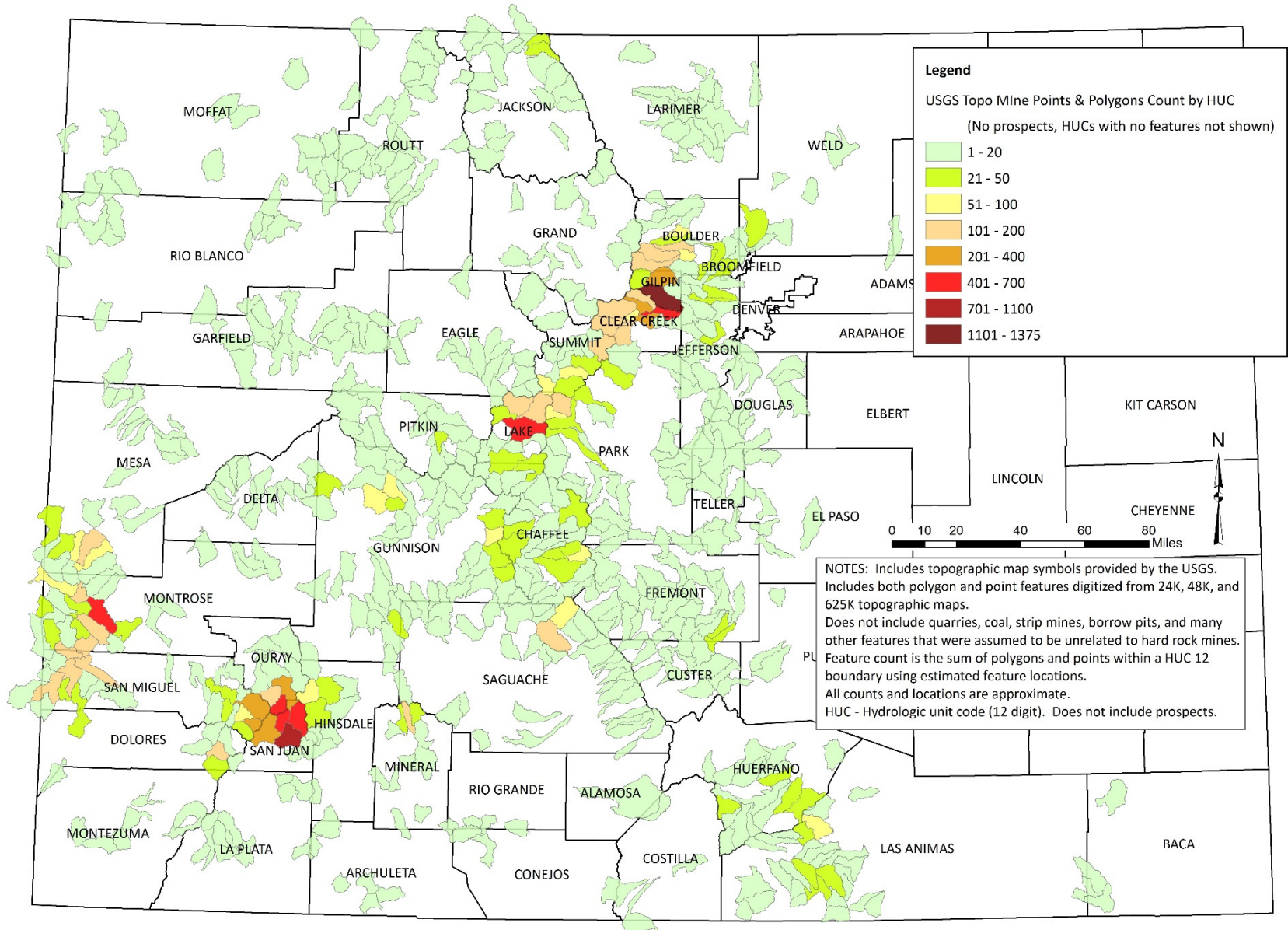
Figure 14 – USGS Prospect- and Mine-Related Feature Location Maps Per HUC12 Without Prospects (includes point and polygon counts). Top: Topo mine symbol count in each HUC12 (points and polygons) excluding prospect pits and holes. Bottom: Topo mine symbol counts over 50 in each HUC12 (points and polygons) excluding prospect pits and holes. Due to unknown commodity and feature types, these maps may show locations that are not related to hardrock mines, uranium mines, and may also include additional prospect pits, etc.

Appendix A

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
Abandoned Mine/HazMat Inventory
Field Inspection Checklist

1. Site Name: _____

2. Location: Latitude/Longitude Decimal /Minutes/Seconds/Hour Seconds **or** UTM (Use NAD 83).

Latitude: _____ (Decimal) Longitude: _____
(Decimal)

3. UTM Zone: _____ E: _____ N: _____ (7 numeric)

4. Ownership: (check all applicable)   Acres: _____
(footprint of site)

☐	Municipal	☐	Private	☐	State	☐	BLM	☐ Other
☐	Mixed	☐	Split Estate	☐	USFS	☐	Unknown	

Feature Types – minimum of one **Physical/Environmental/No Action Needed** = P/E/N
Mitigation – Sign/ Fence/Both= S/.F/B,

5. Feature Types	6. P/E/N	7. S/F/B	Lat/Long(Decimal) or UTM
Closed Adit/Decline/Tunnel			
Closed Adit/Decline/Tunnel			
Closed Shaft/Incline/Stope			
Closed Shaft/Incline/Stope			
Highwalls/Pits			
Highwalls/Pits			
Highwalls/Pits			
Highwalls/Pits			
Highwalls/Pits			
Illegal Dump – Hazardous Waste			
Illegal Dump – Hazardous Waste			
Illegal Dump – Solid Waste			
Illegal Dump – Solid Waste			
Industrial Facility			
Industrial Facility			
Landfill			
Landfill			
Mine/Mineral Processing Mill			
Mine/Mineral Processing Mill			
Non BLM Facility (such as DOE, DOD-FUDS)			
Non BLM Facility (such as DOE, DOD-FUDS)			
Open Adit/Decline/Tunnel			
Open Adit/Decline/Tunnel			
Open Adit/Decline/Tunnel			
Open Shaft/Incline/Stope			
Open Shaft/Incline/Stope			

Open Shaft/Incline/Stope			
Open Shaft/Incline/Stope			
Orphaned Well			
Orphaned Well			
Pipeline Leaks/Spills			
Pipeline Leaks/Spills			
Prospect			
Repository			
Repository			
Reserve Pits/Produced Water Pond/Other E&P Waste			
Reserve Pits/Produced Water Pond/Other E&P Waste			
Spills (Other than Pipelines)			
Spills (Other than Pipelines)			
Tailings			
Tailings			
Tailings			
Tailings			
Tanks (AST & UST)			
Tanks (AST & UST)			
			(Additional rows to use as needed)
8. Additional Feature Types	**P/E/N**	**S/F/B**	**Lat/Long(Decimal) or UTM**

9. Photograph Notes:

Attachment 1-2

10. Field Notes and Comments:

11. INSPECTED BY: _____   12. DATE OF INSPECTION _____

Temporary Form 1703-2   Abandoned Mine/HazMat Inventory Field Inspection Checklist

Abandoned Mine/HazMat Inventory Field Inspection Checklist Instructions

1.   Identify the area impacted by physical safety and/or environment hazards.

2.   Enter the Latitude measurement (North or South of Site); Enter Longitude measurement (East or West of Site) or provide the Universal Transverse Mercator (UTM) measurement. Use the NAD 83 standard.

3.   Enter the Universal Transverse Mercator (UTM) measurement in degrees or provide the Lat/Long measurement.

4.   Identify ownership by checking the appropriate box whether it is Municipal (city or county government), Mixed (Private/Federal, State/Private, Corporation/Federal), Private (Individual or Corporation), Split Estate (Private/Corporation, State/Private), State (State solely), USFS (United States Forest Service solely), BLM (BLM solely), Unknown (Ownership is unknown), and Other (e.g. Native Indian). Check all applicable ownership(s).

5.   Identify the Feature Type (e.g. Illegal Dump –Solid Waste, Landfill, Caved Adit, Highwalls/Pits, or Tailings). Indicate if the Feature Type is a HAZMAT site or AML site.

Closed Adit/Decline Incline/Shaft/Stope/Tunnel
A closed adit/decline/incline/tunnel /shaft/stope are mine features that have been closed and the   general public is unable to enter the mine.

> **Adit** - a horizontal or nearly horizontal passage from the surface into the mine.
> **Decline/incline** - a sloped passage from the surface, at an angle from the horizontal, into the mine. A decline slopes downward and an incline slopes upward from the point of observation.
> **Shaft** - a vertical or inclined excavation in rock for the purpose of providing access to an orebody.
> **Stope** - an underground excavation formed by the removal of ore that has opened to the surface.
> **Tunnel** - a horizontal or nearly horizontal passage that is open on both ends.

Illegal Dump – Solid Waste – abandoned piles of household garbage, bags of yard waste, discarded appliances, old barrels, used tires and demolition debris that can threaten the health of humans, wildlife and the environment.

Illegal Dump – Hazardous Waste – any waste (solid, liquid, or gas) which because of its quantity, concentration, or chemical, physical, or infectious characteristics, pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed.

Attachment 1-4

Highwalls/Pits

Highwall - the unexcavated face of exposed overburden and coal or ore in an opencast mine, or the face or bank on the uphill side of a contour strip mine excavation.

Pit - is an excavation generally circular in outline, with vertical or nearly vertical walls.

Industrial Facility – consists of a site used for any of the following activities such as manufacturing, processing, raw material storage, mining: metal, coal, oil and gas, nonmetallic minerals (SIC 10-14), and oil and gas exploration, production, processing, or treatment operations.

Landfill – Disposal sites for non-hazardous solid wastes spread in layers, compacted to the smallest practical volume, and covered by material applied at the end of each operating day.

Mine/Mineral Processing Mill

A preparation facility within which metal ore is cleaned, concentrated, or otherwise processed before it is shipped to the customer, refiner, smelter, or manufacturer. A mill includes all ancillary operations and structures necessary to clean, concentrate, or otherwise process metal ore, such as ore and gangue storage areas and loading facilities.

Non BLM Facility – a facility located on BLM lands but managed by another federal agency such as a Department of Defense Formally Used Defense site or Department of Energy Research Facility.

Open Adit/Decline Incline/Shaft /Stope/Tunnel

An open adit/decline/incline/shaft/stope/tunnel are mine features that are open and the general public is able to enter the mine. (Mine feature definitions are found in the closed mine features part of this section).

Orphaned Well – is a plugged or unplugged well with no responsible party.

Pipeline Leaks/Spills - dead or discolored vegetation that is otherwise green along a pipeline Right of Way (ROW), or **see** pools of liquid not otherwise usually present along the pipeline ROW, or **see** a cloud of vapor or mist not otherwise usually present along the pipeline ROW; or **smell** an unusual odor or scent of petroleum along a pipeline ROW; or **hear** an unusual hissing or roaring sound along a pipeline ROW.

Attachment 1-5

Prospect

A prospect is an area that has been explored in a preliminary manner but has not given evidence of economic value. A prospect is commonly a shallow excavation (less than or equal to10 feet in depth and less than or equal to 15 feet in diameter), or an adit/incline that is less than 5 feet in length.

Repository

A reclamation feature constructed to hold historic mine tailings that contain high concentrationsof human and environmental concern. Materials used to construct repositories include clay, and other geotextiles. A repository may be several acres in size.

Reserved Pits/Produced Water Pond/Other

A pond is a man-made surface depression holding a body of water. A pond can be lined or unlined. A pond can also contain fresh water, pregnant solution, or barren solution. Reserve pits are ponds that are used to settle out materials and are used for evaporation of water used in the mining process.

Spills (Other than pipelines) - are any oil or petroleum products, chemicals, wastes or other potentially dangerous materials that are released in any manner.

Tailings

Mine tailings are residual materials after the ore-grade materials have been washed, concentrated, or treated. This material is considered too poor a grade to treat any further.

Tanks (above Ground) - A tank located completely or partially aboveground that is designed to hold gasoline or other petroleum products or chemical solutions.

Tanks (under Ground) - A tank located completly or partially underground that is designed to hold gasoline or other petroleum products or chemical solutions.

6. Indicate if the Feature Type is a Physical (P) or Environmental (E) hazard or if No Action (N) is needed (P/E/N). Enter a P/E/N in the box.

7. Indicate if mitigation occurred at site location. Indicate if Signs (S) or Fencing (F) or Both (B) were installed. Enter an S/F/B in the box.

8. Identify any additional feature types. Indicate if the feature type is a Physical (P) or Environmental (E) hazard or if No Action (N) is needed (P/E/N). Also, indicate if mitigation occurred. Indicate if Signs (S) or Fencing (F) or Both (B) were installed. Enter an S/F/B in the box.

9. Indicate if photographs were taken. Provide notes of photographs taken.

Attachment 1-6

10.	Provide any field notes and comments about the site location.

11.	The authorized BLM employee who inspected the site signs this block.

12.	The authorized BLM employee who inspected the site provides the date of inspection.

Attachment 1-7

Inactive Mine Site Field Form
10/99

Project: Lite Kake   **ID**: LK 03   **County**: Park

Mine Name: Unknown   **Project Mgr**: ALA   **Date**: July 7, 2011

Claim Name: Detroit City   **MLS No**: 8413   **AMLIS No**:

Quad Name: ALMA   **Owner**: FC.Owner_Name

Field Description: South of sweet home may connect

Latitude: N 39 ° 18' 46.38"   **UTM**: 13N   403760.37 (E)   4352092.45 (N)
                                   Zone

Longitude: W 106 ° 6' 58.81"   **Elevation**: 0

¼   ¼ SE   ¼ NW   **Section**: 33   **Township**: 8S   **Range**: 78W

Type of Feature: Adit   **Condition**: Partially Collapsed   **Lining**: Rock

Excavated Dimensions: 3 x 4   **Eroded Dims**. 3 x 4   **Construction Dims**: 3 x 4

Depth of Feature: 30   **Depth to Bedrock**:   **Depth to Plug**: N/A   **Shape of Opening**: Oval

Surficial Material: Rocks   **Drainage w/ flow, ppt, pH, etc**: NONE

Existing Access Deterrents: **Access Required?** Yes   **Good equipment access?** No

Possible Bat Habitat? No

Adjacent land Use: Mining   **Mine dump volume & impacts**: 50 cuyds

Preferred Closure Method: Backfill   **Alternative Closure Methods**: Bulkhead,Grate,Adit Door

Structures: None   **Equipment & Debris / Conditions / Types**: None

Work Description:

1ˢᵗ Before Image

Cross Section

Inactive Mine Site Field Form

10/99

Project: Lite Kake   **ID**: LK 03   **County**: Park

Mine Name: Unknown   **Project Mgr**: ALA   **Date**: July 7, 2011

Claim Name: Detroit City   **MLS No**: 8413   **AMLIS No**:

Quad Name: ALMA   **Owner**: FC.Owner_Name

Field Description: South of sweet home may connect

Latitude: N 39 ° 18' 46.38"   **UTM**: 13N   403760.37 (E)   4352092.45 (N)
         Zone

Longitude: W 106 ° 6' 58.81"   **Elevation**: 0

¼   ¼ SE   ¼ NW   **Section**: 33   **Township**: 8S   **Range**: 78W

Type of Feature: Adit   **Condition**: Partially Collapsed   **Lining**: Rock

Excavated Dimensions: 3 x 4   **Eroded Dims.** 3 x 4   **Construction Dims**: 3 x 4

Depth of Feature: 30   **Depth to Bedrock**:   **Depth to Plug**: N/A   **Shape of Opening**: Oval

Surficial Material: Rocks   **Drainage w/ flow, ppt, pH, etc**: NONE

Existing Access Deterrents: **Access Required?** Yes   **Good equipment access?** No

Possible Bat Habitat? No

Adjacent land Use: Mining   **Mine dump volume & impacts**: 50   cuyds

Preferred Closure Method: Backfill   **Alternative Closure Methods**: Bulkhead,Grate,Adit Door

Structures: None   **Equipment & Debris / Conditions / Types**: None

Work Description:

1ˢᵗ Before Image

Cross Section

Inactive Mine Site Field Form

10/99

Project: Lite Kake   **ID**: LK 03   **County**: Park

Mine Name: Unknown   **Project Mgr**: ALA   **Date**: July 7, 2011

Claim Name: Detroit City   **MLS No**: 8413   **AMLIS No**:

Quad Name: ALMA   **Owner**: FC.Owner_Name

Field Description: South of sweet home may connect

Latitude: N 39 ° 18' 46.38"   **UTM**: 13N   403760.37 (E)   4352092.45 (N)
Zone

Longitude: W 106 ° 6' 58.81"   **Elevation**: 0

¼   ¼ SE   ¼ NW   **Section**: 33   **Township**: 8S   **Range**: 78W

Type of Feature: Adit   **Condition**: Partially Collapsed   **Lining**: Rock

Excavated Dimensions: 3 x 4   **Eroded Dims**. 3 x 4   **Construction Dims**: 3 x 4

Depth of Feature: 30   **Depth to Bedrock**:   **Depth to Plug**: N/A   **Shape of Opening**: Oval

Surficial Material: Rocks   **Drainage w/ flow, ppt, pH, etc**: NONE

Existing Access Deterrents: **Access Required?** Yes **Good equipment access?** No

Possible Bat Habitat? No

Adjacent land Use: Mining   **Mine dump volume & impacts**: 50 cuyds

Preferred Closure Method: Backfill   **Alternative Closure Methods**: Bulkhead,Grate,Adit Door

Structures: None   **Equipment & Debris / Conditions / Types**: None

Work Description:

1ˢᵗ Before Image

Colorado Division of Reclamation, Mining, and Safety
Inactive Mine Site Field Form
10/99

Project: Lite Kake **ID**: LK 03 **County**: Park

Mine Name: Unknown **Project Mgr**: ALA **Date**: July 7, 2011

Claim Name: Detroit City **MLS No**: 8413 **AMLIS No**:

Quad Name: ALMA **Owner**: FC.Owner_Name

Field Description: South of sweet home may connect
Latitude: N 39 ° 18' 46.38" **UTM**: 13N   403760.37 (E)   4352092.45 (N)
 Zone

Longitude: W 106 ° 6' 58.81" **Elevation**: 0

¼   ¼ SE   ¼ NW   **Section**: 33 **Township**: 8S **Range**: 78W

Type of Feature: Adit **Condition**: Partially Collapsed **Lining**: Rock

Excavated Dimensions: 3 x 4 **Eroded Dims.** 3 x 4 **Construction Dims**: 3 x 4

Depth of Feature: 30 **Depth to Bedrock**: **Depth to Plug**: N/A **Shape of Opening**: Oval

Surficial Material: Rocks **Drainage w/ flow, ppt, pH, etc**: NONE

Existing Access Deterrents: **Access Required?** Yes **Good equipment access?** No

Possible Bat Habitat? No

Adjacent land Use: Mining **Mine dump volume & impacts**: 50 cuyds

Preferred Closure Method: Backfill **Alternative Closure Methods**: Bulkhead,Grate,Adit Door

Structures: None   **Equipment & Debris / Conditions / Types**: None

Work Description:

1ˢᵗ Before Image

Cross Section

Topographic Map Scale: 1 : 24,000

Site Map

Topographic Map Scale: 1 : **24,000**

Site Map

USFS-AMLI FIELD DATA FORM

LOCATION AND IDENTIFICATION

A

3

M

(1) **ID#:** 02- 08- _1 5_ - _1 0_ - _4 2 7_ / _4 3 8 1_ - _2_
   rgn st   fst   rd   xutm   yutm   area#

(2) **Sitename:** _Allan Emory Mine_

(3) **Other name/reference:** _N.E. Face of Morgan Peak_

(4) **Highest priority Environmental Degradation occurring in this area:**
   1=extreme; 2=significant; 3=potentially significant; 4=slight; 5=none

(5) **Highest priority Mine Hazard noted in this area:**
   E=emergency; 1=extreme danger; 2=dangerous; 3=potentially dangerous;
   5=no significant hazard

(6) **Commodity:** C=coal; U=uranium; M=metals; I=industrial material.
   (Metal or Indust. material type: _____)

(7) **Quad name and date:** _Montezuma 1974_

(8) **County:** _Summit_

(9) **2° map:** _Denver_ ~~Leadville~~

(10) **Water Cataloguing Unit #:** _14010002_

(11) **Mining district/coal field:** _Montezuma_

(12) **Land survey location:** ___ - _E ½_ sec _25_ ,T _5 S_ ,R _76 W_

(13) **Receiving stream:** _Warden Gulch_ flowing into _Peru Creek_
   nearest named stream   next named

(14) **Elevation (ft):** _12,000_

3

M

(15) **General Slope:** 1=0-10°; 2=11-35°; 3=greater than 35°

(16) **Regional terrain:** R=rolling or flat; F=foothills; T=mesa; H=hogback;
   M=mountains; S=steep/narrow canyon

N / J

(17) **Type of access:** N=no trail; T=trail; J=jeep road; G=gravel road;
   M=paved road; P=private/restricted road

P

(18) **Quality of access for construction vehicles:** G=good; M=moderate; P=poor;
   X=very poor

(19) **Nearest town on map:** _Montezuma_

5.0

(20) **Road distance from nearest town (#.# miles)**

(21) **Nearest road (name and/or #):** _____
   FR=forest rd; CR=county rd; SH=state highway; I=interstate

Distance to following types of public uses (#.# miles):

On Site   (22) **Road**   _2.5_ (25) **Marked trail**

_5.0_   (23) **Dwelling (year-round)**   _2.0_ (26) **Other public use (explain)**

   (24) **Campground/picnic area**   _Peru Creek Rd. (Popular Jeep Road / x-c ski trail)_

ENVIRONMENTAL INFORMATION

S

(27) **Vegetation density adjacent to site:** D=dense; M=moderate; S=sparse;
   B=barren

W / G / r / T

(28) **Vegetation type adjacent to site:** B=barren; W=weeds; G=grass; R=riparian
   S=sagebrush/oakbrush/brush; J=juniper/piñon; A=aspen; P=pine/spruce/fir;
   T=tundra

N

(29) **Evidence of intentional reclamation:** Y=yes; N=no (if yes, use comments)

0.5

(30) **Size of disturbed area in acres**

Y

(31) **Potential historical structures in area:** Y=yes; N=no (if yes, use comments)

N

(32) **Evidence of bats:** G=guano; I=insect remains; B=bat sighting; O=other(use
   comments); N=no (use comments to expand on any positive evidence)

(33) **Recorded by/date:** _Joey Klei~ 9/3/93_

ADITS, SHAFTS, AND OPENINGS

Feature Nos.		100	101	102	103	104	105	106	107	108	109	110	111
Type of Feature		A	A	A	A	A	A	A	A				
Opening Size (ft)	H	UNK	UNK	4	UNK	1	UNK	→	→				
	W	UNK	UNK	5	UNK	4	UNK	→	→				
Depth (ft)		UNK	UNK	50+	UNK	10+	UNK	→	→				
Condition		F	F	I	F	P	F	→	→				
Drainage		N	N	N	N	N	N	→	→				
Access Deterents		N	N	N	N	N	N	→	→				
Deterent Condition													
Ratings	Env. Deg.	5	5	4	5	5	5	→	→				
	Hazard	5	5	3	5	5	5	→	→				
Photo	Roll No.	M-8						—	—				
	Frame No.	1,2	1	12			13	—	—				
Comments?		Y											

DUMPS, TAILINGS, AND SPOIL BANKS

Feature No.		200	201	202	203	204	205	206	207	208
Type of Feature		D	D	D	D		D		V	
Plan view Dimension (ft.)	L	70	135	70	75		50		55	
	W	40	60	50	40		40		40	
Volume (yds)		1160	9000	1780	1900		750		900	
Steepest Slope Angle (dgr)		R								
Steepest Slope Length (ft)		45	120	55	70		40		45	
Size of Materials		F→B	F→L	F→B	F→B		F→L		F→B	
Cementation		W	W	M	W		W		W	
Vegetation Type		B	W/G	B	W/G		W/G/0		B	
Vegetation Density		B	S	B	S		M		B	
Drainage		N	N	N	N		N		N	
Stability		S	S	P	S		S		S	
Water Erosion	of Feature	N	R/G	N	R		N		N	
	Storm Runoff	C	S	N	N		N		N	
Wind Erosion		N	N	N	N		N		N	
Radiation Count		NA	NA	NA	NA		NA		NA	
Access Deterents		N	N	N	N		N		N	
Deterent Condition										
Ratings	Env. Deg.	4	4	5	5		5		5	
	Hazard	5	5	5	5		5		5	
Photo	Roll No.	M-8								
	Frame No.	1,2	1							
Comments?		Y								
Soil Sample No.										

DRAINAGE/WATER SAMPLES						
Item Nos.	300	301	302	303	304	305
Adit/Shaft/Dump No./Other=0 (If other location, describe in comments)						
pH (standard units)						
Conductivity (uS)						
Flow (gpm)						
Method of Flow Measure						
Date Flow/Sample (m/d/y)						
Location of Sample/Flow						
Evidence of Toxicity in Site Drainage						
Evidence of Toxicity in Receiving Stream						
Distance from Stream (ft)						
Comments?						
Lab Water Sample No.						

GPS READINGS	
Ftr. No.	Location
	Lat. Long.
	Lat. Long.
	Lat. Long.
	Lat. Long.
	Lat. Long.
	Lat. Long.
	Lat. Long.
	Lat. Long.
	Lat. Long.
	Lat. Long.
	Lat. Long.

DIAGRAM OF PROBLEM AREA (Locate all adits, shafts, dumps, prospects, etc. on topo map.)

Check off upon completion: __ north arrow; __ scale bar or general size noted; __ direction to nearest trail/road/town noted; __ significant mine features numbered

●81. Local person interviewed _____

              Name   Address

●82. Name and address of person desiring a copy of this form:_____

_____

●83. Describe the minimum work needed to mitigate any public health, safety, welfare, or environmental problems observed at the site. Note specific reclamation activities along with an estimated cost and time period to implement each activity described. Code costs as: 1= less 10,000; 2= $10,000 to $100,000; 3= $100,000 to $500,000; 4= more than $500,000. Code estimated time to complete the activity as: 1= less than 1 month; 2= 1 to 12 months; 3= 1 to 3 years; 4= over 3 years

Cost	Time	Recommended reclamation activity

●84. Comments relating to health, safety, welfare, environmental, or restoration problems and any general comments. All comments must be keyed to mine feature # or drainage/water sample item #.

100 Adit is collapsed. No water, No Phys. Danger

200 Dump is in contact with high intermittent stream headwaters of Warden Gulch. Gulch is dry at this time but appears to be degraded by dump. Potentially significant degradation

101 Adit is collapsed No Water No Phys. Danger

201 Dump is long and reaches near intermittent stream. Dump has one large gully and some rills. Slight degradation

102 Adit is intact. Portal is 4x5 and is at least 50 feet deep. No Water at this time but adit is moist. Potentially dangerous

202 Dump is high and dry. No Hazards.

103 Adit is collapsed No water No Phys. Hazard.

203 Dump is high and dry.

104 Adit is partially collapsed. Very small opening. Might be more than 10 feet deep No Hazard due to remoteness Dump is under 50 cubic feet in volume.

105 Adit is collapsed. No water at this time but is moist. Much vegetation grows near portal. No env. degradation. Adit has created 15 foot high wall. potentially dangerous

205 Dump is high and dry. Moderate vegetation.

106,107 Small collapsed adits No water No Hazards

207 Small dump High and dry.

                                        -if more comments use back of page →

General Comment:_____

_____

_____

_____

                                        -if more comments use back of page →

OFFICE/LITERATURE INFORMATION

●41. Owner of surface _____
●42. Last known operator _____
●43. Estimated production _____
●44. Dates of production _____
●45. Literature not cited in comments_____
●46. Citation of any historical register listing ___ Ore chute, collapsed cabin between Adits 100 & 101

31

Most of site is on or above timberline and is far from any stream. There is also no water draining from these mines. The only Environmental degradation would be from dump 200, because it is in avalanche gully which eventually becomes warden gulch. This feature could be classified as a slight degradation. Dump 201 has been eroded downhill and has many rills and gullies This dump could also be a slight degradation.

As far as physical hazards go, adits 102 and 104 are a concern. Adit 102 is intact and atleast 50 feet deep. It also near a jeep trail. Adit 104 is partially collapsed and is harder to find. There are two adits south of these features which are also only partially collapsed. These two adits appear to be on a private claim. There is a jeep trail which comes to within 500 ft of all features.

Appendix B

BLM AMSCM

Table - BLM AMSCM Data Fields Summary (from Final Defense-Related Uranium Mines Location and Status Topic Report, U.S. DOE, August 2014, Doc. No. S10693, Appendix C)

Field Names	Comments/Description
OID	internal ID field
MINE_NAME	Mine name
STATE_ID	State location code
COUNTY_NAM	County name
ROAD_LOG	Driving directions
EVALUATOR	Name of site evaluator
USGS_QUAD_	Vertical distance from a datum usually mean sea level
DATE_	
OPENING_TY	
SIZE_OPENI	
DEPTH_OPEN	
NUM_OPENI	
GROUND_STA	
WASTE_PRES	
ACCESSIBIL	
POPULATED_	
VISIBILITY	
STRUCTURES	
RESCUE_DIF	
HAZARD_REC	
WATER_PRES	
WILDLIFE_U	
RECREATION	
LAND_DEVEL	
SCORE_TOTA	
FIELD_ACTI	
MERIDIAN	Line extending north and south on the surface of the earth between the two poles and runs along the astronomical meridian. The principal meridian is the line from which the survey township boundaries along the parallels are initiated
TOWNSHIP	A public land surveying unit. An approximately square area about six miles on a side with boundaries conforming to meridians and parallels within established limits. It is subdivided into 36 sections some of which are designed to take up the convergence of
RANGE	Any series of contiguous townships situated north and south of each other; also sections similarly situated within a township. Ranges of townships are numbered consecutively east and west from a principal meridian: thus "range 3 east" indicates the third r
SUBDIV	
MIT_FENCED	
RECOMMENDA	Field notes
FIELD_NOTE	Field notes
TYPES_OF_E	
MIT_SIGNS	
VEHICLE_AC	
WILDLIFE	
SURF_OWN	
SIGNIFICAN	
ELEVATION	
STATUS	
WASTE_ROCK	
SIZE_WASTE	
POT_WIND_E	
IND_METAL_	
WATER_NEAR	
WATER_TYPE	
H20_PRES	
WATER_PROD	
METHOD_PRE	
GPS_CORREC	
NORTHING	UTM Northing

Table - BLM AMSCM Data Fields Summary (from Final Defense-Related Uranium Mines Location and Status Topic Report, U.S. DOE, August 2014, Doc. No. S10693, Appendix C)

Field Names	Comments/Description
EASTING	UTM Easting
UTM_ZONE	UTM Zone
DATUM	Datum
MAPLTR	
GEO_STATE	State abbreviation
DIST_RA	
SITE_ID	
MILS_ID	
STATEID	
PRI_COMDTY	
COUNTY	
MIN_OWN	
VIS_ROAD	
VIS_TRAIL	
VIS_POPUL	
DIFFICULTY	Driving conditions
HUMAN_USE	
HUMAN_DES	
REC_MINACT	
MINACT_DES	
NO_OP_ADIT	
NO_CL_ADIT	
NO_OP_INCL	
NO_CL_INCL	
NO_OP_SHFT	
NO_CL_SHFT	
NO_STOPES	
NO_OTH_OP	
OTH_TYPE	
NO_TRENCH	
TRENCH_LEN	
NO_PROSP	
NO_OP_DH	
NO_PIT_G30	
NO_PIT_L30	
PT_HIGHWAL	
WASDMP_L01	
WASDMP01_5	
WASDMP_G5	
TAILS_L_01	
TAILS_01_5	
TAILS_G5	
NO_HEAPS	
NO_DREDGE	
NO_PONDS	
NO_DAMS	
NO_MILLS	
MILL_TYPE	
NO_EXPLSV	
EXPLSV_DES	
EQUIP_MACH	
HEADFRAMES	
TREST_TRAM	
POPWERLINES	
STRUCTURE_	
STRUCT_TYP	
STUCT_CON	
STRUCT_LOK	
HOMESITES	

Table - BLM AMSCM Data Fields Summary (from Final Defense-Related Uranium Mines Location and Status Topic Report, U.S. DOE, August 2014, Doc. No. S10693, Appendix C)

Field Names	Comments/Description
OTHER_FEAT	
VEG_COND	
REVEG_EVID	
REVEG_DESC	
ANIML_EVID	
ANIML_PRES	
ANIML_DES	
STAIN_SOIL	
STAIN_DESC	
SULF_MIN	
SULFMINTYP	
TAILS	
FLOW_H2O	
STAND_H2O	
TAILS_H2O	
WASTE_H2O	
ORE_H2O	
AJ_GRD_H2O	
AJ_SUR_H2O	
AM_SURFH2O	
BM_SURFH2O	
CHEM_PILES	
ACID_ODOR	
ASBESTOS	
PETROCHEMS	
DUMPSITES	
POWER_SUBS	
TRANSFORMS	
BARREL_TNK	
LEAKING	
UNDRG_STR	
STOR_DESCR	
OTHER	
RILLS	
GULLIES	
SHEETWASH	
UNSTABL_RX	
SLOPE_INST	
WIND_EROS	
MITIG_STAT	
HAZ_MITIG	
OTHER_MIT	
MIT_COND	
MAX_PDOP	
RCVR_TYPE	
FILT_POS	
STD_DEV	
GPS_HEIGHT	
NUM_PHOTOS	Number of photos
ICF_ID	
DB_ALIAS	

Table - BLM AMSCM Data Fields Summary (from US Department of the Interior BLM Abandoned Mine/HazMat Inventory Field Inspection Checklist, Temporary Form 1703-2, Attachment 1-2, August 2008)

Field/Form Names	Comments/Description
Site Name	
Latitude	Decimal
Longitude	Decimal
UTM Zone	
UTM Zone Easting	7 numeric
UTM Zone Northing	7 numeric
Ownership	Municipal, mixed, private, split estate, state, USFS, BLM, Unknown, Other
Acres	
Feature Type	Minimum of one per site: closed adit/decline/tunnel, closed shaft/incline/stope, etc.
Type of Hazard	Physical, environmental, no action needed (P/E/N)
Mitigation	Sign, fence, both (S/F/B)
Photograph	
Photograph Notes	
Field Notes and Comments	
Inspected by	
Date of Inspection	

CDRMS Brass Caps

Table - Colorado DRMS Brass Caps Data Fields Summary (from Final Defense-Related Uranium Mines Location and Status Topic Report, U.S. DOE, August 2014, Doc. No. S10693, Appendix C)

Field Names	Comments/Description
OID	internal ID field
ICF_ID	unique ID
PROJECT_NA	Name of project area that is being inventoried
FEATURE_ID	Identification number of each feature within a project area
FEATURE_TY	Type of abandoned mine feature
COMMODITY	Product of mining efforts
COUNTYFIPS	Federal Information Processing Standards Code
COUNTYNAME	The name of the county where the mine is located
LAT_DEG	Degrees of Latitude for mine location
LAT_MIN	Minutes of Latitude for mine location
LAT_SEC	Seconds of Latitude for mine location
LONG_DEG	Degrees of Longitude for mine location
LONG_MIN	Minutes of Longitude for mine location
LONG_SEC	Seconds of Longitude for mine location
LAND_OWNER	Name of land owner
DB_ALIAS	Data source code
STATE_ID	Enter the State of Utah Abandoned Mine Reclamation number for the site. This field is 11 characters in length.
PRI_COMDTY	The entry is a numeric field with 3 spaces provided. Enter the primary commodity being mined from ORCA Commodity Code Data Dictionary 2303
UTM_ZONE	UTM zone number.
NORTHING	AML site coordinate reference.
EASTING	AML site coordinate reference.
MERIDIAN	Enter the meridian code from ORCA Data Dictionary 1703
SITE_ACRES	Enter cumulative or total acres of surface disturbance rounded to the nearest tenth excluding the access acreage. Acreage is calculated by multiplying the length by the width of the disturbance due to mining and then dividing by 43560.
REC_MINACT	If there is evidence of recent mineral activity (within the last year) select Y from the menu list. If there is no evidence of recent mineral activity then select N from the menu list. If it is unknown whether there is evidence of recent mineral activity
MINACT_DES	Describe the evidence of recent mineral activity observed (e.g., fresh cuts on working face of an open pit
NO_OP_ADIT	Enter the number of open adits found within the site. An adit is a horizontal or nearly horizontal passage (0-10 degrees) from the surface into the mine. Examples of an open adit include when the lock on a gated entry is broken when the entry has collapse
NO_CL_ADIT	Enter the number of closed adits found within the site. A closed adit is an adit that restricts the general public from entering the mine or that has been reclaimed. A closed adit may be gated blasted shut
NO_OP_INCL	Enter the number of open inclines found within the site. An incline is a sloped passage (11-65 degrees) from the surface into the mine.
NO_CL_INCL	Enter the number of closed inclines found within the site. A closed incline is an incline that restricts the general public from entering the mine or that has been reclaimed. A closed incline may be gated blasted shut
NO_OP_SHFT	Enter the number of open shafts within the site. A shaft is a vertical excavation through which a mine is worked (66 to 90 degrees). Examples of an open shaft include when debris bridges the shaft 5 to 10 feet down from the collar and/or the collapsed stope
NO_CL_SHFT	Enter the number of closed shafts found within the site. A closed shaft is a shaft that restricts the general public from entering the mine or that has been reclaimed. A closed shaft may be grated
NO_STOPES	Enter the number of stopes found within the mine site. A stope is an underground excavation formed by the removal of ore that has opened to the surface. Note location(s) of all stopes on the sketch map using the appropriate symbol from page 6 of the Check
NO_OTH_OP	Enter the number of other openings found within the mine site. Other openings are glory holes or ventilation holes
OTHER_TYPE	List the type of other openings counted. This entry is 20 characters long.
NO_TRENCH	Enter the number of trenches that are greater than 3 feet
NO_PROSP	Enter the number of prospects found within the mine site. A prospect is an area that has been explored in a preliminary way but has not given evidence of economic value. A prospect is commonly a shallow excavation (equal to or less than 10 feet deep and l
NO_OP_DH	Enter the number of open drill holes found within the mine site. A drill hole is a circular hole made by drilling. There are many drilling methods. Three common methods are percussion rotary

Table - Colorado DRMS Brass Caps Data Fields Summary (from Final Defense-Related Uranium Mines Location and Status Topic Report, U.S. DOE, August 2014, Doc. No. S10693, Appendix C)

Field Names	Comments/Description
NO_PIT_G30	Enter the number of pits greater than 30 feet deep found within the mine site. A pit is an excavation generally circular in outline with vertical or nearly vertical walls. Note location(s) of all pits greater than 30 feet deep on the sketch map using the a
NO_PIT_L30	Enter the number of pits equal to or less than 30 feet deep that occur within the mine site. A pit is an excavation generally circular in outline with vertical or nearly vertical walls. On the sketch map
PT_HIGHWAL	Enter the total circumference of all pit high walls greater than 10 feet deep
WASDMP_L01	Enter the number of waste dumps that are less than 0.1 ac in size within the mine site. A waste dump is the area where barren or low-grade material is discarded. This material is usually dumped just beneath the level of the adit portal or shaft collar. In
WASDMP01_5	Enter the number of waste dumps that are 0.1 - 5 ac in size within the mine site. A waste dump is defined above under WASDMP_L01. Include ore stockpiles in this entry. Note location(s) of all waste dumps on the sketch map using the appropriate symbol from
WASDMP_G5	Enter the number of waste dumps that are greater 5 ac in size within the mine site. A waste dump is defined above under WASDMP_01. Include ore stockpiles in this entry. Note location(s) of all waste dumps on the sketch map using the appropriate symbol fro
TAILS_L_01	Enter the number of tailings that are less than .1 ac in size within the mine site. Mine tailings are residual materials after the ore-grade materials have been washed concentrated
TAILS_01_5	Enter the number of tailings that are greater .1 but less than 5 acres in size within the mine site. Mine tailings are defined above under TAILS_l_01. Note location(s) of all tailings on the sketch map using the appropriate symbol from page 6 of the Check
TAILS_G5	Enter the number of tailings that are greater than 5 acres in
NO_HEAPS	Enter the number of heap leach pads found within the site.
NO_DREDGE	Number of locations within the site where dredging was used to extract ore. Two methods of dredging are bucket-line and suction. A bucket-line dredge is a dredge in which the material excavated is lifted by a chain of buckets. The bucket-line dredge opera
NO_PONDS	Enter the number of ponds found within the site. A pond is a man-made surface depression holding a body of water. A pond can be lined or unlined. They can also contain freshwater pregnant solution
NO_DAMS	Enter the number of dams found within the site. A dam is a man-made feature constructed to create a pond for storage of water divert water from a watercourse into a conduit
NO_MILLS	Enter the number of mills found within the site. Note location(s) of all mill sites on the sketch map using the symbol for structures on page 6 of the Checklist with an M inside the symbol.
MILL_TYPE	Enter the appropriate number(s) for the type of mill or mills found on the mine site. The numbering convention for the types of mills found at the site is given below. If there are multiple mills at the site they are enter sequentially with no spaces nor
EQUIP_MACH	Enter the number of locations where mining equipment or machinery has been left or stored on the site. Note location(s) of all mining equipment or machinery on the sketch map using the directions on the lower right side of page 6 of the Checklist.
HEADFRAMES	Enter the number of headframes found within the site area. A headframe is a steel or wood frame at the top of a shaft which carries the pulley for the hoist. Note location(s) of headframes on the sketch map using the symbol for structures on page 6 of the
TREST_TRAM	Enter the number of trestles and tramways found within the site. A trestle is a framework of timber piles
POWERLINES	Enter the number of power lines found within the site. Power lines would be used to bring electrical power to the mining operation. These may be aviation hazards. Note location(s) of the power lines on the sketch map using the appropriate symbol from page 6
STRUCTURES	Enter the number of other structures that occur within the site. All abandoned structures except for mills headframes
STRUCT_TYP	Describe what the other structures were used for if known.
HOMESITES	Enter the number of structures used as a homesite within the site. A homesite is a structure that is used as living quarters and is currently being occupied. Note the location(s) of all homesites on the sketch map.
OTHER_FEAT	Enter feature found on the site which is not described above.

Table - Colorado DRMS Brass Caps Data Fields Summary (from Final Defense-Related Uranium Mines Location and Status Topic Report, U.S. DOE, August 2014, Doc. No. S10693, Appendix C)

Field Names	Comments/Description
TAILS	Tailings are washed or milled ore that is too poor a grade to be treated further. Select from the menu options the appropriate description of the tailings configuration. The options provided are Confined or Unconfined
NO_SAMPLES	Enter the number of water samples taken for analysis.
BACKG_RAD	Background is the overall reading of the ore host rock formation of the area being investigated. Enter the background gamma reading in milli-roentgen per hour.
ADIT_RAD	Enter the highest gamma reading taken for all the adits and inclines within the site.
ADIT_WL	Enter the corresponding working level reading for the adit or incline recorded above under ADIT_RAD.
SHAFT_RAD	Enter the highest gamma reading taken for all the shafts for all the shafts within the mine site.
SHAFT_WL	Enter the corresponding working level reading for the shaft recorded above under SHAFT_RAD.
OTHER_RAD	Enter the highest gamma reading taken for all the other features found within the mine site.
OTHER_WL	Enter the corresponding working level reading for the other feature recorded above under OTHER_RAD.
DATE	The data logger will automatically generate the date the information is collected in the field.
FIPSCODE	Federal Information Processing Standards Code
DATEADDED	Date record was created in database.
ADDEDBY	User name or process by which the record was added to the database.
DB_ALIAS	A numeric reference to identify each record with its original database.
ADDEDBY	

Table - Colorado DRMS Brass Caps Data Fields Summary (from Colorado Division of Reclamation, Mining, and Safety Inactive Mine Site Field Form 10/99)

Field/Form Names	Comments/Description
Project	
ID + MLS No.	
County	
Mine Name	
Project Mgr.	
Date	
Claim Name	
MLS No	
AMLIS No	
Quad Name	
Owner	
Field Description	
Latitude	
Longitude	
UTM Zone	
Elevation	
Quarter Section (1)	
Quarter Section (2)	
Quarter Section (3)	
Section	
Township	
Range	
Type of Feature	
Condition	
Lining	
Excavated Dimensions	
Eroded Dimensions	
Construction Dimensions	
Depth of Feature	
Depth to Bedrock	
Depth to Plug	
Shape of Opening	
Surficial Material	
Drainage w/ flow, ppt, pH, etc.	
Existing Access Deterrents	
Access Required?	
Possible Bat Habitat?	
Adjacent land use	
Mine dump volume and impacts	
Preferred closure method	
Alternative closure methods	
Structures	
Equipment & Debris/Conditions/Types	
Work Description	
Photos	

DOE DRUM/AUM

Table - Defense-Related Uranium Mine Data Fields Summary

Table/Field Name	Description
tbl_Location	
ID	Unique Identification (ID) Number- Part of Database Structure
State	State Name
County	County Name
District	Mining District (from original AEC production records)
Locality	Mining Locality (from original AEC production records)
Latitude	Latitude
Longitude	Longitude
Township	Public Land Survey System - Township
Range	Public Land Survey System - Range
Section	Public Land Survey System - Section
Subsection	Public Land Survey System - Subsection (quarter-quarter or lot)
Datum	Horizontal Datum of Latitude/Longitude
CoordStatusID	Coordinate Status - has the coordinate been verified?
Comment	Location Comment
tbl_Mine_MineGroup	
ID	Unique ID
ClaimName	Mine Name
AltName	Alternate Mine Name
MineTypeID	Unique ID
MineArea	Mine Area (e.g., acres, square feet, etc.)
DistanceToRoad	Distance to Road
DistanceToStream	Distance to Stream
DistanceToWell	Distance to Well
DistanceToPopCenter	Distance to Population Center
AEC_Location	Location from AEC Production Records
NN_ProvidedLocation	Location Provided from Navajo Nation
NavajoLandLocation	Location Provided from Navajo Nation
EPA_ID	EPA Designated Mine Identification Number
LM_ID	DOE Legacy Management Designated Identification Number
LocationID	Unique ID
IsDeleted	
tbl_OwnerOperator	
ID	Unique ID
MineID	Unique ID
Owner	Site Owner
Operator	Site Operator
Permittee	Site Permittee
OwnOpSourceID	Owner Information Source
PermitteeSourceID	Permittee Information Source
tbl_Production	
ID	Unique ID
ProdClass	Range of Class/Size Mine (e.g., [small] 0-100 tons, [small/medium] 100-1000 tons,..)
ProdDescription	Description of Production Size of Mine (e.g., small, small/medium)
tbl_MineStatus	
MineID	Unique ID
MineStatusID	Unique ID
OriginalStatus	Status from Original Data Source
Comment	Comment
DataSourceID	Unique ID
tbl_MineFeatures	
ID	Unique ID
MineID	Unique ID
Adits	Number or Description of Adits
WastePiles	Number or Description of Waste Piles
WastePilesArea	Area of Waste Pile
WastePilesVolume	Volume of Waste Pile
Pits	Number or Description of Pits
Shafts	Number or Description of Shafts
OtherDebris	Number or Description of Other Debris
Misc	Number or Description of Miscellaneous Features
Structures	Number or Description of Structures
Comment	Comment
DataSourceID	Unique ID

Table/Field Name	Description
tbl_MineType	
ID	Unique ID
Type	Mine Type
tbl_LandOwner	
ID	Unique ID
MineID	Unique ID
AgencyID	Unique ID
Name1	Land Owner Name 1
Name2	Land Owner Name 2
Feature1_ID	Land Owner Feature 1
Feature2_ID	Land Owner Feature 2
MineralOwner	Mineral Rights Owner
Comment	Comment
DataSourceID	Unique ID
tbl_LandOwner…	
ID	Unique ID
ContactName	Land Owner Contact
tbl_Cost	
ID	Unique ID
MineID	Unique ID
Cost	Cost
Description	Description of Cost
Year	Year of Cost Data
Comment	Comment
DataSourceID	Unique ID
tbl_RadGamma	
ID	Unique ID
MineID	Unique ID
GammaAvgBackground	Gamma Range Background
GammaAvg	Average Gamma Measurement
GammaMax	Maximum Gamma Measurement
GammaRangeComment	Comment
GammaRangeWastePiles	Gamma Range for Waste Piles
GammaRangeBackground	Gamma Range Background
GammaUnits	Measurement Units
Comment	Comment
DataSourceID	Unique ID
tbl_RadSoil	
ID	Unique ID
MineID	Unique ID
RadiumAvg	Average Radium-226 in Soil
RadiumRange	Measurement Range
RadiumBackground	Background Measurement
RadiumUnits	Measurement Units
Comment	Comment
DataSourceID	Unique ID
tbl_RadRadon	
ID	Unique ID
MineID	Unique ID
RadonAvg	Average Radon Measurement
RadonRange	Radon Measurement Range
RadonBackground	Background Measurement
RadonUnits	Measurement Units
Comment	Comment
DataSourceID	Unique ID
tbl_SurfaceWaterData	
ID	Unique ID
MineID	Unique ID
Comment	Comment
DataSourceID	Unique ID
tbl_GroundwaterData	
ID	Unique ID
MineID	Unique ID
Comment	Comment
DataSourceID	Unique ID

Table/Field Name	Description
tbl_Status	
ID	Unique ID
Status	Mine Status
StatusDesc	Mine Status Description
tbl_MineProduction	
ID	Unique ID
MineID	Unique ID
TonsOre	Tone of Ore Produced
PoundsU3O8	Pounds of Uranium Oxide Produced
GradePct	Percent Grade
FirstProdYear	First Year of Production
LastProdYear	Last Year of Production
ProdClassID	Unique ID
Comment	Comment
DataSourceID	Unique ID
tbl_CoordStatus	
ID	Unique ID
CoordStatus	Coordinate Status
tbl_DataSources	
ID	Unique ID
Name	Data Source Name (e.g., name of a report or map)
Type	Data Source Type
Originator	Originator of Data Source
Description	Description of Data Source
Comments	Comment
FileName	Data Source File Name
FilePath	Data Source File Path (where is it being electronically stored)
SharepointLink	SharePoint Link
tbl_Location_DataSource	
LocationID	Unique ID
DataSourceID	Unique ID
tbl_Comments	
ID	Unique ID
MineID	Unique ID
Comment	Comment
CommenyBy	Who Made the Comment
CommentDate	Date Comment Was Made
ActionReq	Action Required?
ActionCompleted	Date Action Was Completed
ActionDesc	Description of Action
CommentSource	Source of Information
tbl_VisualCheck	
ID	Unique ID
MineID	Unique ID
AerialID	Visible on Aerial Photo
USGS_TopoID	Visible on USGS Topo
CheckedBy	Checked By
CheckedDate	Date Checked
Comment	Comment
ActionReq	Action Required?
ActionCompleted	Date Action Was Completed
ActionDesc	Description of Action Required
tbl_MineCategory	
CategoryID	Unique ID
MineID	Unique ID
tbl_Categories	
ID	Unique ID
Category	
tbl_VisualCheck	
ID	Unique ID
VisualCheckDesc	Description of Visual Check

NOTES: Received from the DOE LM via email on 052016.

Defense-Related Uranium Mine
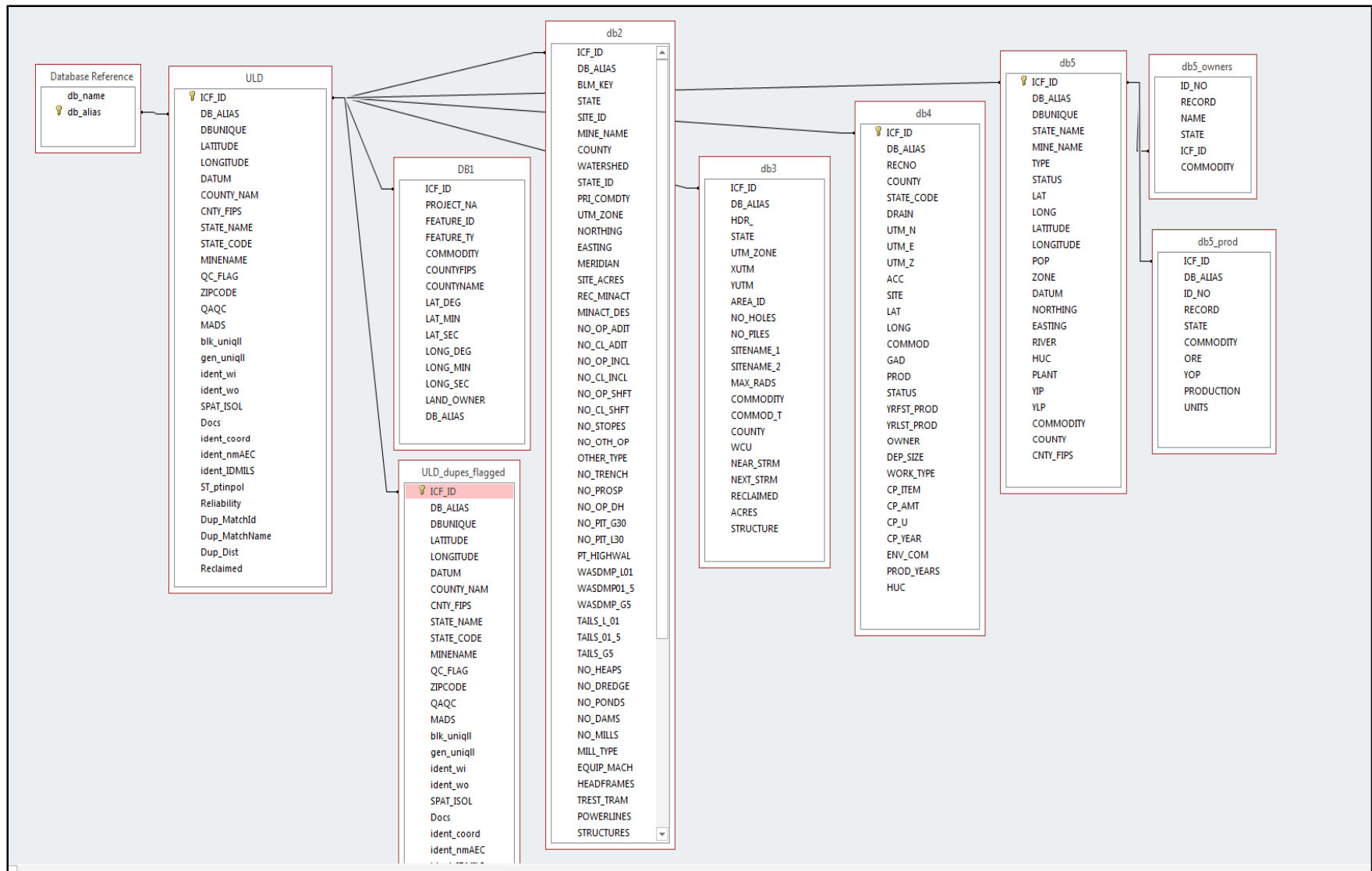# Database Entity Relationship Diagram

v_Search
Properties
- MineID
- ClaimName
- AltName
- MineArea
- State
- County
- District
- Locality
- Township
- Range
- Section
- Subsection
- Latitude
- Longitude
- Category
- Type
- Status
- ProductionID
- ProdClass
- ProdDescription
- FirstProdYear
- LastProdYear
- LandOwnerID
- MineralOwner
- Name1
- Name2
- AgencyContact
- Feature1Contact
- Feature2Contact
- OwnOpID
- Owner
- Operator
- Permittee

Navigation Properties

tbl_Productio...
Properties
- ID
- ProdClass
- ProdDescription

Navigation Properties

tbl_CoordStatus
Properties
- ID
- CoordStatus

Navigation Properties

tbl_Location
Properties
- ID
- State
- County
- District
- Locality
- Latitude
- Longitude
- Township
- Range
- Section
- Subsection
- Datum
- CoordStatusID
- Comment

Navigation Properties
- tbl_Mine
- tbl_CoordStatus
- tbl_Location_Dat...

tbl_MineFeatu...
Properties
- ID
- MineID
- Adits
- WastePiles
- WastePilesArea
- WastePilesVolu...
- Pits
- Shafts
- OtherDebris
- Misc
- Structures
- Comment
- DataSourceID

Navigation Properties
- tbl_DataSources

tbl_Comments
Properties
- ID
- MineID
- Comment
- CommentBy
- CommentDate
- ActionReq
- ActionCompleted
- ActionDesc
- CommentSource

Navigation Properties

tbl_Location_DataSource
Properties
- LocationID
- DataSourceID

Navigation Properties
- tbl_DataSources

tbl_VisualCheck
Properties
- ID
- MineID
- AerialID
- USGS_TopoID
- CheckedBy
- CheckedDate
- Comment
- ActionReq
- ActionCompleted
- ActionDesc

Navigation Properties
- Aerial
- USGS_Topo

tbl_VisualChe...
Properties
- ID
- VisualCheckDesc

Navigation Properties

tbl_Cost
Properties
- ID
- MineID
- Cost
- Description
- Year
- Comment
- DataSourceID

Navigation Properties
- tbl_DataSources

tbl_MineProd...
Properties
- ID
- MineID
- TonsOre
- PoundsU3O8
- GradePct
- FirstProdYear
- LastProdYear
- ProdClassID
- Comment
- DataSourceID

Navigation Properties
- tbl_ProductionCl...
- tbl_DataSources

tbl_MineType
Properties
- ID
- Type

Navigation Properties

tbl_Mine_MineGroup
Properties
- ID
- ClaimName
- AltName
- MineTypeID
- MineArea
- DistanceToRoad
- DistanceToStream
- DistanceToWell
- DistanceToPopCenter
- AEC_Location
- NN_ProvidedLocation
- NavajoLandLocation
- EPA_ID
- LM_ID
- LocationID
- IsDeleted

Navigation Properties
- tbl_Location
- tbl_OwnerOperator
- tbl_MineProduction
- tbl_MineStatus
- tbl_MineFeatures
- tbl_LandOwner
- tbl_Cost
- tbl_RadGamma
- tbl_RadSoil
- tbl_RadRadon
- tbl_SurfaceWater
- tbl_Groundwater
- tbl_Comments
- tbl_VisualCheck
- tbl_MineType
- tbl_MineCategories

tbl_MineCate...
Properties
- CategoryID
- MineID

Navigation Properties
- tbl_Categories

tbl_Categories
Properties
- ID
- Category

Navigation Properties

tbl_RadRadon
Properties
- ID
- MineID
- RadonAvg
- RadonRange
- RadonBackgrou...
- RadonUnits
- Comment
- DataSourceID

Navigation Properties
- tbl_DataSources

tbl_DataSources
Properties
- ID
- Name
- Type
- Originator
- Description
- Comments
- FileName
- FilePath
- SharepointLink

Navigation Properties
- tbl_Location_Dat...

tbl_Groundwa...
Properties
- ID
- MineID
- Comment
- DataSourceID

Navigation Properties
- tbl_DataSources

tbl_SurfaceWa...
Properties
- ID
- MineID
- Comment
- DataSourceID

Navigation Properties
- tbl_DataSources

tbl_RadGamma
Properties
- ID
- MineID
- GammaAvgBack...
- GammaAvg
- GammaMax
- GammaRangeC...
- GammaRangeW...
- GammaRangeBa...
- GammaUnits
- Comment
- DataSourceID

Navigation Properties
- tbl_DataSources

tbl_RadSoil
Properties
- ID
- MineID
- RadiumAvg
- RadiumRange
- RadiumBackgro...
- RadiumUnits
- Comment
- DataSourceID

Navigation Properties
- tbl_DataSources

tbl_OwnerOpe...
Properties
- ID
- MineID
- Owner
- Operator
- Permittee
- OwnOpSourceID
- PermitteeSource...

Navigation Properties
- OwnOpSource
- PermitteeSource

tbl_MineStatus
Properties
- MineID
- MineStatusID
- OriginalStatus
- Comment
- DataSourceID

Navigation Properties
- tbl_Status
- tbl_Mine
- tbl_DataSources

tbl_Status
Properties
- ID
- Status
- StatusDesc

Navigation Properties

tbl_LandOwner
Properties
- ID
- MineID
- AgencyID
- Name1
- Name2
- Feature1_ID
- Feature2_ID
- MineralOwner
- Comment
- DataSourceID

Navigation Properties
- tbl_DataSources
- AgencyContact
- Feature1Contact
- Feature2Contact

tbl_LandOwne...
Properties
- ID
- ContactName

Navigation Properties

EPA ULD

DOE Uranium Mine Location Database	
DISTRICT	
LOCALITY	
CLAIM_NUMBER	
CLAIM_NAME	
STATE	
COUNTY	
TONS_OF_ORE	
POUNDS_U308	
GRADE_PERCENT	
LATITUDE	Latitude decimal degrees
LONGITUDE	Longitude decimal degrees
DATUM	Datum
EPA_ICF_ID	
EPA_DB_ALIAS	
EPA_DB_UNIQUE	

ULP Data Entry Template (information from AEC documents)	
District	
Locality	
Claim No.	
Claim Name	
State	
County	
Tons of Ore	
Pounds U308	
Grade (%)	

ULD: Uranium Location Database, U.S. Environmental Protection Agency	
ICF_ID	Unique Identifier this field is used to identify and join each record in the separate databases
DB_ALIAS	A numeric reference to identify each record with its original database.
DBUNIQUE	Unique Identifier from the source database
LATITUDE	Latitude in decimal degrees
LONGITUDE	Longitude in decimal degrees
DATUM	Horizontal datum assume NAD83
COUNTY_NAM	County Name
CNTY_FIPS	Any of the standardized systems of numeric and/or alphabetic coding issued by the National Institute of Standards and Technology (NIST) an agency in the U.S. Department of Commerce
STATE_NAME	State Name
STATE_CODE	State Abbreviation
MINENAME	Mine Name as identified in the source database
QC_FLAG	Outlier Flag of "9" indicates coordinates place mine outside appropriate state boundary
ZIPCODE	A five-digit code assigned by the U.S. Postal Service to a section of a street a collection of streets

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QAQC	Identifies mine locations that were reviewed for quality assurance quality control
MADS	Method accuracy and description of point location determinations. This field is obsolete since proper MAD codes have not been assigned as much of the MAD-related information is not available for the vast majority of the records.
gen_uniqll	A value of "1" in this field indicates that the record has a non-generic mine name or that it has a non-generic mine name AND a unique coordinate pair.
ident_wi	A value of "1" in this field indicates that the record contains a unique coordinate pair as compared to all other records in the source database.
ident_wo	A value of "1" in this field indicates that the record contains a unique coordinate pair as compared to all other records across all source databases.
spat_isol	A value of "1" in this field indicates that the record is spatially isolated. Spatial isolation is defined here as a uranium activity with no other uranium activity within 2400 meters (1.5 miles).
docs	A value of "1" indicates that the data source has documentation.
ident_coord	A "1" indicates that the record does not share identical coordinates with any other record in the entire database.
ident_nmAEC	A value of "1" indicates that the uranium activity shares the precise name of a uranium activity listed in the authoritative US Atomic Energy Commission's Uranium Mine and Properties Database (UMPD) within the same State.
ident_IDMILS	A "1" indicates that the record is not known to have originated from MASMILS.
ST_ptinpol	This field has the name of the state in which the point is located based on a point-in-polygon analysis.
Reliability	This field holds the cumulative reliability value – a sum of the values from the other reliability fields. Reliability in this context.
Dup_MatchID	This code is the ICF_ID code of the other ULD location that it was matched to in the duplicate removal process. For the duplicates-removed version of the database this ICF_ID should either match the one in the ICF_ID field.
Dup_MatchName	In the duplicate removal process this field was populated with either a 1.
Dup_Dist	This field records the distance (meters) between a duplicate and its keeper. For keepers, the value of this field is zero. For records not included in the duplicate identification process for various reasons.
Reclaimed	Information about reclamation status and activities. This information can be found for some sources in the original data files.

DB1:BRASSCAP	
OID	internal ID field
ICF_ID	unique ID
PROJECT_NA	Name of project area that is being inventoried
FEATURE_ID	Identification number of each feature within a project area
FEATURE_TY	Type of abandoned mine feature
COMMODITY	Product of mining efforts
COUNTYFIPS	Federal Information Processing Standards Code
COUNTYNAME	The name of the county where the mine is located
LAT_DEG	Degrees of Latitude for mine location
LAT_MIN	Minutes of Latitude for mine location
LAT_SEC	Seconds of Latitude for mine location
LONG_DEG	Degrees of Longitude for mine location
LONG_MIN	Minutes of Longitude for mine location
LONG_SEC	Seconds of Longitude for mine location
LAND_OWNER	Name of land owner
DB_ALIAS	Data source code

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EPA Uranium Location Database Relationship Diagram

Database Reference
- db_name
- db_alias

ULD
- ICF_ID
- DB_ALIAS
- DBUNIQUE
- LATITUDE
- LONGITUDE
- DATUM
- COUNTY_NAM
- CNTY_FIPS
- STATE_NAME
- STATE_CODE
- MINENAME
- QC_FLAG
- ZIPCODE
- QAQC
- MADS
- blk_uniqll
- gen_uniqll
- ident_wi
- ident_wo
- SPAT_ISOL
- Docs
- ident_coord
- ident_nmAEC
- ident_IDMILS
- ST_ptinpol
- Reliability
- Dup_MatchId
- Dup_MatchName
- Dup_Dist
- Reclaimed

DB1
- ICF_ID
- PROJECT_NA
- FEATURE_ID
- FEATURE_TY
- COMMODITY
- COUNTYFIPS
- COUNTYNAME
- LAT_DEG
- LAT_MIN
- LAT_SEC
- LONG_DEG
- LONG_MIN
- LONG_SEC
- LAND_OWNER
- DB_ALIAS

ULD_dupes_flagged
- ICF_ID
- DB_ALIAS
- DBUNIQUE
- LATITUDE
- LONGITUDE
- DATUM
- COUNTY_NAM
- CNTY_FIPS
- STATE_NAME
- STATE_CODE
- MINENAME
- QC_FLAG
- ZIPCODE
- QAQC
- MADS
- blk_uniqll
- gen_uniqll
- ident_wi
- ident_wo
- SPAT_ISOL
- Docs
- ident_coord
- ident_nmAEC

db2
- ICF_ID
- DB_ALIAS
- BLM_KEY
- STATE
- SITE_ID
- MINE_NAME
- COUNTY
- WATERSHED
- STATE_ID
- PRI_COMDTY
- UTM_ZONE
- NORTHING
- EASTING
- MERIDIAN
- SITE_ACRES
- REC_MINACT
- MINACT_DES
- NO_OP_ADIT
- NO_CL_ADIT
- NO_OP_INCL
- NO_CL_INCL
- NO_OP_SHFT
- NO_CL_SHFT
- NO_STOPES
- NO_OTH_OP
- OTHER_TYPE
- NO_TRENCH
- NO_PROSP
- NO_OP_DH
- NO_PIT_G30
- NO_PIT_L30
- PT_HIGHWAL
- WASDMP_L01
- WASDMP01_5
- WASDMP_G5
- TAILS_L_01
- TAILS_01_5
- TAILS_G5
- NO_HEAPS
- NO_DREDGE
- NO_PONDS
- NO_DAMS
- NO_MILLS
- MILL_TYPE
- EQUIP_MACH
- HEADFRAMES
- TREST_TRAM
- POWERLINES
- STRUCTURES

db3
- ICF_ID
- DB_ALIAS
- HDR_
- STATE
- UTM_ZONE
- XUTM
- YUTM
- AREA_ID
- NO_HOLES
- NO_PILES
- SITENAME_1
- SITENAME_2
- MAX_RADS
- COMMODITY
- COMMOD_T
- COUNTY
- WCU
- NEAR_STRM
- NEXT_STRM
- RECLAIMED
- ACRES
- STRUCTURE

db4
- ICF_ID
- DB_ALIAS
- RECNO
- COUNTY
- STATE_CODE
- DRAIN
- UTM_N
- UTM_E
- UTM_Z
- ACC
- SITE
- LAT
- LONG
- COMMOD
- GAD
- PROD
- STATUS
- YRFST_PROD
- YRLST_PROD
- OWNER
- DEP_SIZE
- WORK_TYPE
- CP_ITEM
- CP_AMT
- CP_U
- CP_YEAR
- ENV_COM
- PROD_YEARS
- HUC

db5
- ICF_ID
- DB_ALIAS
- DBUNIQUE
- STATE_NAME
- MINE_NAME
- TYPE
- STATUS
- LAT
- LONG
- LATITUDE
- LONGITUDE
- POP
- ZONE
- DATUM
- NORTHING
- EASTING
- RIVER
- HUC
- PLANT
- YIP
- YLP
- COMMODITY
- COUNTY
- CNTY_FIPS

db5_owners
- ID_NO
- RECORD
- NAME
- STATE
- ICF_ID
- COMMODITY

db5_prod
- ICF_ID
- DB_ALIAS
- ID_NO
- RECORD
- STATE
- COMMODITY
- ORE
- YOP
- PRODUCTION
- UNITS

NPS AML

Table - U.S. National Park Service Abandoned Mine Lands Data Fields Summary

Table/Field Name	Description	Comments
SITE/GENERAL		
Region	Region	AKR, IMR, MWR, NCR, NER, PWR, SER
Park_Code	4-character park acronym - e.g., ACAD, DEVA, BISO	4-character park acronym - e.g., ACAD, DEVA, BISO
Site_Name	The official name, or if not known, an identifying name (e.g., Unknown 1 Grizzly Gulch 1 etc.)	Enter the official name, or if not known, an identifying name (e.g., Unknown 1 Grizzly Gulch 1 etc.)
CAMLU_Site_Number	California Parks Only - State AML Unit's unique site identification number	California Parks Only - State AML Unit's unique site identification number
Site_Type	Underground Mine, Surface Mine, Placer Mine, Mill, Well, Road, Underground Mine - Mill, Surface Mine - Mill, Underground-Surface Mine, Underground-Surface Mine - Mill, Other	Underground Mine, Surface Mine, Placer Mine, Mill, Well, Road, Underground Mine - Mill, Surface Mine - Mill, Underground-Surface Mine, Underground-Surface Mine - Mill, Other
State	2-letter postal code (if site crosses state line, pick primary and list other in Site_Notes)	2-letter postal code (if site crosses state line, pick primary and list other in Site_Notes)
County	if more than one county, pick primary and list other in Site_Notes	(if more than one county, pick primary and list other in Site_Notes)
Congressional_Dist	often requested in funding proposals - these sometimes change	(often requested in funding proposals - these sometimes change)
Watershed	Primary watershed name that would be used when partnering with other agencies on major clean-up projects.	Primary watershed name that would be used when partnering with other agencies on major clean-up projects.
Site_Acres	Measure or estimate size of surface disturbance for entire site (tenths of acres used for smaller sites)	Measure or estimate size of surface disturbance for entire site (tenths of acres used for smaller sites)
Ownership	Legal ownership: Federal, Private (including patented mining claims), Unpatented (unpatented mining claim), State, County, Other , Unknown	Legal ownership: Federal, Private (including patented mining claims), Unpatented (unpatented mining claim), State, County, Other , Unknown
Admin_Use	Yes/No/Unknown - Is the site used administratively by NPS, e.g., sand/gravel quarry for park roads?	Yes/No/Unknown - Is the site used administratively by NPS, e.g., sand/gravel quarry for park roads?
FMSS_Loc_ID	Facility Management Software System Location ID	Facility Management Software System Location ID
FMSS_API	Facility Management Software System Asset Priority Index (1-100)	Facility Management Software System Asset Priority Index (1-100)
FMSS_FCI	Facility Management Software System Facility Condition Index (0.000 -X.XXX)	Facility Management Software System Facility Condition Index (0.000 -X.XXX)
CERCLA	If this is a CERCLIS site, give CERCLIS #. Alphanumeric code starting with State Acronym followed by 10 digits (e.g., AK1231231231)	If this is a CERCLA site, give CERCLIS #. Alphanumeric code starting with State Acronym followed by 10 digits (e.g., AK1231231231)
EDL	Environmental and Disposal Liabilities database number - DOI list that tracks environmentally contaminated sites (formerly ECL" - Environmental Cleanup Liabilities database). Alphanumeric code: Bureau Code ("5" for NPS) + Region Code + Site # (1 to 4-digit number) - e.g. 5AR1 5IMR3161 "	Environmental and Disposal Liabilities database number - DOI list that tracks environmentally contaminated sites (formerly ECL" - Environmental Cleanup Liabilities database). Alphanumeric code: Bureau Code ("5" for NPS) + Region Code + Site # (1 to 4-digit number) - e.g. 5AR1 5IMR3161 "
Compliance_Date	Give date that compliance was completed, and list compliance type (Categorical Exclusion, EA FONSI, or EIS ROD) in Site_Notes.	Give date that compliance was completed, and list compliance type (Categorical Exclusion, EA FONSI, or EIS ROD) in Site_Notes.
PEPC	Give PEPC number, or if multiple PEPC numbers were used for various features at this site, list the main one and record others in Site_Notes. PEPC can be used to track NEPA and other compliance requirements, such as NHPA, ESA, wetlands/Section 404 permitting, etc.There is no need to replicate those records in the AML database.	Give PEPC number, or if multiple PEPC numbers were used for various features at this site, list the main one and record others in Site_Notes. PEPC can be used to track NEPA and other compliance requirements, such as NHPA, ESA, wetlands/Section 404 permitting, etc.There is no need to replicate those records in the AML database.
Site_Notes	Include other ID numbers from different databases or additional PEPC numbers here.	Include other ID numbers from different databases or additional PEPC numbers here.
SITE GEOLOGIC RESOURCES		
Commod_Gen	Commodity (general)	Metals, Coal, Industrial Minerals, Energy Minerals (e.g., Uranium), Stone (building stone and stone products), Sand and Gravel, Oil and Gas, Geothermal, Water, Unknown
Commod_Specif	Commodities (specific)	List by chemical symbol (Au, Ag, Cu, Zn, Pb, Fe, U, etc.), mineral name (talc, wollastonite, barite, etc.), rock/stone type (granite, marble, limestone, sandstone, cinders, etc.), or well commodity (oil, gas, geothermal, water, etc.)
Geology_Notes	Notes on geology	e.g., Rock Type (igneous/sedimentary/metamorphic, granite/sandstone/schist); Geologic Formation; Orebody Type (vein, disseminated, massive); Ore Type (sulfide, oxide)
SITE NATURAL RESOURCE IMPACTS		
NatRes_Impacts	Resource impacts in need of mitigation?	Yes/No/Unknown
Effluent	Effluent from site?	Yes/No/Unknown
Water	Standing water at site?	Yes/No/Unknown
Water_Tail	Water flowing through tailings or mineralized waste rock?	Yes/No/Unknown
Stain	Staining on soils/rocks?	Yes/No/Unknown
Sediment	Sedimentation into surface waters?	Yes/No/Unknown
Vegetation	Characterize vegetation on the disturbed area	Healthy, Struggling, Dead, Nonexistent
Est_Waste_Vol	Estimated total volume of waste rock on-site (incl. unshipped ore -cubic yards)	Use this field if individual piles are not listed as separate features.
Est_Tail_Vol	Estimated total volume of milled tailings on-site (cubic yards)	Use this field if individual piles are not listed as separate features.
Visual	How visible is site from where visitors would be?	High/Medium/Low
Other_Impacts	Other impacts	An impact that exists that was not mentioned (specify)
Impact_Notes	Notes on resource impacts	
SITE - CULTURAL RESOURCES		
CultRes_Signif	Significant cultural resource values?	Yes/No/Unknown
Register	National Register listing or nomination?	Yes/No/Unknown (National Register of Historic Places, National Natural Landmark, National Historic Landmark)
Landscape	Has the park declared this a cultural landscape?	Yes/No/Unknown
Eligible	Eligible for National Register listing?	Yes/No/Unknown (Is it possible, or has it been determined under a Determination of Eligibility (DOE), that this site is eligible for listing in NRHP, NNL, or NHL?
Interpret	Is site interpreted?	Yes/No/Unknown (interpretive sign, brochure, etc.)
Cult_Notes	Notes on cultural values	
FEATURE IDENTIFICATION / STATUS - GENERAL		
NPS_ID	Servicewide Identification Code	NOT AN INPUT FIELD. GENERATED AUTOMATICALLY BY DATABASE FROM INPUT DATA: <Park_ID>-<Site_Name>-<Feature_Type>-<number (assigned sequentially by database)> (e.g., DEVA-Skidoo-OS-01, NERI-Kaymore-AD-03).
Park_ID	Park Identification Code	Park's verbatim in-house identification code. If park has its own database and nomenclature, we want to be able to link that to the Servicewide Database. Some parks have multiple features listed under one identifier. The Servicewide Database separates these out with a unique NPS_ID for each feature.
Legacy_ID	Legacy Identification Code	Previously-used identification code that has since been changed due to uncovering new information -When early inventories are updated and information is found that may link a mine more specifically to a particular operation than previously known, or to a different operation, this field preserves the name given in previous surveys, by which some personnel may more commonly know it. Example 1: Ownership previously unknown, so park called a particular solo adit, Unknown #8" (Legacy_ID). Subsequently we learn that the Acme Mining Company operated the mine so now the park calls it "Acme Adit" (Park_ID) and in the Servicewide AML Database it becomes "PARK-Acme-AD-01" (NPS_ID). "
CAMLU_Feature_Number	CAMLU Feature Number	California Parks Only - State AML Unit's unique feature identification number
Other_ID	Other Identification Code	This field has been added due to demand to track other numbering systems, such as the BLM Mining Claim Number, USGS-USBOM MAS/MILS SEQ number, Smithsonian Trinomial Number, American Petroleum Institute (API) Well #, etc. Please indicate in Feature Notes to which numbering system your Other ID pertains.
Feature_Type	Feature Type	Underground Excavations: Adit, Shaft, Incline, Tunnel, Open Stope, Vent Raise, Glory Hole, Subsidence, Prospect. Surface Excavations: Surface Mine, Highwall, Trench. Other Features: Waste Rock, Tailings, Ore Pile, Topsoil Stockpile, Road, Impoundment, Embankment, Building, Structure, Equipment, Well, Hazmat Cache, Artifact Concentration, Trash Pile, Explosives Cache, Other, Unknown (for legacy data only). [SEE DETAILED LIST]
Action_Required	Action Required	Yes/No/Unknown - Is action required for this feature other than monitoring and maintenance?
High_Risk	High Risk	Yes/No/Unknown - Is this feature high risk" described in the Director's 10/02/08 memorandum? (Director Bomar's 10/02/08 memorandum was in response to the DOI Inspector General's July 2008 Audit Report of the NPS and BLM AML Programs. The IG called for prompt closure of all "high-risk" sites. Risk is determined by each park based on degree of danger and likelihood of visitation. Suggest "Yes" if Hazard Rating is 3 or more AND Access Rating is 4 or more. "
Source		General text field - staff person, literature, etc.
Rev_Date	Revision Date (MM/DD/YYYY)	Update this field every time you make a revision. Database provides pop-up date-picker calendar.
Feature _Notes	Feature Notes	If other describe: e.g., drill hole, trench, arrastra. Use this field for any necessary additional feature description.
FEATURE ACCESS		
Method	Access Method	Paved Road, Improved Dirt Road, 4WD Road, Hike, Boat, Helicopter
Dist_road	Distance from drivable road (tenths of miles)	Straight-line distance if cross-country; distance on path if path is near site
Dist_path	Distance from established path (tenths of miles)	If a road is closer than a path, enter the distance from the road.
Published	Where is location published	Map (e.g., symbol on USGS topo map, or indicated on other map), Brochure, Book, Internet, Peer-Reviewed Paper, Gray Literature, Not Published, Unknown
Wilderness	Is feature in designated wilderness	Yes/No/Unknown
Evid_Visit	Evidence of visitation	None, Moderate (some trash, footprints), High (lots of trash, etc. or feature is known to have high visitation), Underground Access (graffiti, trash, footprints, etc., within mine workings).
Access_Notes	Notes on Access	
FEATURE GEOGRAPHIC DESCRIPTION		
Quad	Quadrangle Name	USGS Quad Map Name
Lat_ddeg_NAD83	Latitude North	NAD83 decimal degrees - 6 decimal places (NOTE: All new data should be entered in NAD83 LAT/LONG DECIMAL DEGREES, preferably to 6 decimal places if we actually have that degree of accuracy (~ 1 meter). UTM and Public Land Survey System (PLSS: Township/Range/Section) data fields are only to retain historic data where we have not yet updated with recent GPS readings. (Essential only for new entries)
Long_ddeg_NAD83	Longitude West	NAD83 decimal degrees - 6 decimal places. (Essential only for new entries)
Elevation	Elevation	Feature elevation, given in feet.

Table - U.S. National Park Service Abandoned Mine Lands Data Fields Summary

Table/Field Name	Description	Comments
Location_Accuracy	Location Accuracy	Location Information Accuracy - Differential GPS, Uncorrected GPS, General Site Coordinates, Topo Symbol, Imagery (aerial photo, satellite, etc.), X on map, ¼ Section, Section. (Essential only for new entries)
GPS_Year	GPS Year	Year of GPS reading
Aspect	Aspect	Direction of slope where feature is situated. Lookup Table: N, NE, E, SE, S, SW, W, NW, V (vertical). This can have great significance in predicting potential habitat, particularly in underground mines, e.g., a south-facing shallow adit is unlikely to support hibernation.
Boundary	Within park boundary?	Yes/No/Unknown - Within park boundary? (Some sites straddle the park boundary with features inside and outside of the park. Many parks record sites just outside their boundaries that may require management attention / resources. We don't want to lose track of that data, but need to be able to separate them out as not being our ultimate responsibility.)
UTM_N	UTM North	UTM Northing (meters)
UTM_E	UTM East	UTM Easting (meters)
UTM_Zone	UTM Zone	UTM Zone (1 to 60)
Meridian	Meridian	Principle Meridian
Township	Township	PLSS Township - Enter N or S after number
Range	Range	PLSS Range - Enter E or W after number
Section	Section	PLSS Section - 1 to 36
Quadrant	Quadrant	PLSS Quadrant / quarter-section description - NE, SE, SW, NW

FEATURE DIMENSIONS

Table/Field Name	Description	Comments
Feature_Dim_X	Shaft width 1 / Pit width 1 / Adit width / Trench width (feet)	
Feature_Dim_Y	Shaft width 2 / Pit width 2 / Adit height / Trench length (feet)	
Feature_Depth	Shaft depth / Pit depth / Adit length / Trench depth (feet)	Directly measured, or estimated where direct measurement is not possible. If estimated, enter YES under Feature Depth Uncertain." If feature is collapsed at the entry leave this field blank mark YES for "Feature depth uncertain" and "Feature naturally reclaimed and mark NO for Action Required." "
Feature_Depth_Uncertain	Feature Depth Uncertain	Yes/No/Unknown - Answer Yes" where mine workings continue out of sight either because underground entry is not permissible or if full underground survey is not possible due to hazards. Enter "Yes" for deep shafts where estimate has been made by timing how long it takes a dropped rock to hit bottom (Distance (ft) = 0.5 x 32.17 x sec2) or where a "false bottom" is suspected. Discuss details in Access Notes field. "
Distub_Area	Area of disturbance around feature (square feet)	Some parks include measurements on the disturbed area immediately surrounding each feature, either by total area (Disturb_Area) or by length x width dimensions (Disturb_Length x Disturb_Width). These fields are not to be confused with total site area (Site_Acres), although they may be the same for single-feature sites.
Distub_Area_L	Disturbed Area Length (feet)	
Disturb_Area_W	Disturbed Area Width (feet)	

FEATURE BIOLOGICAL RESOURCES

Table/Field Name	Description	Comments
BiolRes_Signif	Significant biological resource values?	Yes/No/Unknown
Species_TE	T & E species present?	Yes/No/Unknown
Species_Concern	Other species of concern present?	Yes/No/Unknown (e.g., former Category 2 Species, State-listed species, or significant habitat for common species)
Bats	Bats (or evidence of bats) observed?	Yes/No/Unknown (Bats are singled out because they so often determine closure type, making this a good field on which to search.)
Biology_Notes	Notes on biological issues present	

FEATURE HAZARDS

Table/Field Name	Description	Comments
Hazards	Hazards in need of mitigation?	Yes/No/Unknown
Debris	Debris at this feature?	Yes/No/Unknown - Note: Large, discrete piles that merit further characterization can be called out as separate Trash" features. "
Highwall	Highwall present?	Yes/No/Unknown
Rockfall	Rockfall hazards present, esp. at entry?	Yes/No/Unknown
Fall	Falling hazards due to vertical drop-offs present?	Yes/No/Unknown
Flooded	Flooded, or evidence of flooding?	Yes/No/Unknown (Flooded shaft, seasonally flooded shaft, or impoundments inside adit that trap water?)
Explosives	Explosives present?	Yes/No/Unknown
Bad_Air	Bad air present or documented previously?	Yes/No/Unknown [Note that this can change from visit to visit.]
Subsidence	Areas of subsidence or collapse?	Yes/No/Unknown (e.g., slump zones on the surface, underground collapses, or slope failure caused by feature)
Fire	Evidence of underground fire?	Yes/No/Unknown (Includes coal mine fires, burned timbers, campfire ring, etc. underground)
Hazsub	Hazardous substances (other than explosives) present?	Yes/No/Unknown
Haz_Notes	Notes on hazards	

FEATURE MITIGATION REQUIRED - SPECIFIC

Table/Field Name	Description	Comments
Temp_Safe	Temporary safing method required	Sign, Fence, Administrative Closure, etc.
Mitig_Opt1	Mitigation Option 1	Proposed long-term mitigation technique - OPTION 1 - Reclamation, Bat Gate, Bat Cupola, Bat Culvert, Gate, Grate, Concrete Cover, Cablenet, Backfill, PUF, Bulkhead, Fence, Blasting, Structure Removal, Structure Stabilization, Sign, To be determined, Other, No Action. Please explain Other" and "To be Determined" in Mitig_Req_Notes field. "
Opt1_Cost	Estimated cost of Option 1	If NEPA is not yet complete, please include a markup to cover NEPA costs (typically an additional 5-10% of the closure cost). If the cost has yet to be determined precisely, please enter your best estimate, or request assistance from your Regional AML Coordinator or the Servicewide AML Coordinator.
Opt1_Cost_Year	Year of mitigation cost estimate for Option 1.	
Mitig_Opt2	Mitigation Option 2	Proposed long-term mitigation technique - OPTION 1 - Reclamation, Bat Gate, Bat Cupola, Bat Culvert, Gate, Grate, Concrete Cover, Cablenet, Backfill, PUF, Bulkhead, Fence, Blasting, Structure Removal, Structure Stabilization, Sign, To be determined, Other, No Action. Please explain Other" and "To be Determined" in Mitig_Req_Notes field. "
Opt2_Cost	Estimated cost of Option 2.	If NEPA is not yet complete, please include a markup to cover NEPA costs (typically an additional 5-10% of the closure cost). If the cost has yet to be determined precisely, please enter your best estimate, or request assistance from your Regional AML Coordinator or the Servicewide AML Coordinator.
Opt2_Cost_Year	Year of mitigation cost estimate for Option 2.	
PMIS	PMIS number	Recovery Act Reporting Field -Numeric identifier with alpha components included
FMSS_Asset_ID	FMSS Asset ID	Facility Management Software System Asset ID - numeric identifier
Mitig_Req_Notes	Notes on mitigation required	Give details (e.g., location of gate 8 feet inside of portal).

FEATURE MITIGATION COMPLETED - SPECIFIC

Table/Field Name	Description	Comments
Nat_Recl	Feature naturally reclaimed?	Yes, No, Unknown - Has this feature naturally reclaimed such that no work is required?
Temp_Safe_Used	Temporary safing method used	Recovery Act Reporting Field -Sign, Fence, Fence and Sign, Administrative Closure, Other
Temp_Safe_Date	Date of temporary closure (MM/DD/YYYY)	Database provides pop-up date-picker calendar.
Mitig_Used	Mitigation technique used	Recovery Act Reporting Field -Reclamation, Bat Gate, Bat Cupola, Bat Culvert, Gate, Grate, Concrete Cover, Cablenet, Backfill, PUF, Bulkhead, Fence, Blasting, Structure Removal, Structure Stabilization, Sign, Other. Please explain Other" in Mitig_Compl_Notes field. "
Mitig_Date	Date feature was reclaimed/mitigated (MM/DD/YYYY)	Database provides pop-up date-picker calendar.
Mitig_Cost	Cost of mitigation ($)	May need to estimate proportion of multi-opening projects
Mitig_Funds	Source of funding	NRPP, Recovery Act (ARRA), Fee Program, GRD, State, Park Base, Region, OSM, Other
Mitig_by	Who mitigated the feature?	Who performed the mitigation work? NPS (in-house job), Contractor (NPS-hired contractor), State (State-hired contractor), Other
Partners	What partners were used?	Federal, State, Industry, Volunteers, Other (e.g., conservation groups), None
Mitig_Compl_Notes	Notes on completed mitigation	(list partners, if applicable)

FEATURE SAMPLE AND RANKING DATA (refer to Ranking System Guide, below)

Table/Field Name	Description	Comments
Water_Samp	Was water sampled?	Yes/No/Unknown
pH_Effl	pH of effluent (to nearest tenth)	
pH_bg	Background pH (to nearest tenth)	
Water_Contam	Elevated contaminant levels in the water?	Yes/No/Unknown. If conductivity meter is used, please record levels in Contam_Notes.
Soil_Samp	Soils / tailings / waste rock sampled?	Yes/No/Unknown
Soil_Contam	Elevated contaminant levels in the soil?	Yes/No/Unknown
Contam_Notes	Notes on contamination	If contamination is suspected, please record notes / recommendations.
Hazard_Rating	Danger associated with hazards	5/4/3/2/1/0 (See Ranking System Guide, below) [Field required except for legacy data.]
Workings_Extensive	Are underground workings extensive (> 500' or multilevel)?	Yes = 1, No = 0 (This adds one point to the total ranking score for more complex fearures.) (See Ranking System Guide) [Field required except for legacy data.]
Access_Rating	Difficulty of access	5/4/3/2/1/0 (See Ranking System Guide) (Essential only for new entries) [Field required except for legacy data.]
Resource_Rating	Importance of resource	4/2/0 (See Ranking System Guide) (Essential only for new entries) [Field required except for legacy data.]
Impact_Rating	Severity of resource impacts	4/2/0 (See Ranking System Guide) (Essential only for new entries) [Field required except for legacy data.]

FEATURE MONITORING

Table/Field Name	Description	Comments
Monit_Date	Monitoring Date (MM/DD/YYYY)	Date of Observation. Database provides pop-up date-picker calendar.
Monit_Observation	Monitoring Observation	Notes for each date

Table - U.S. National Park Service Abandoned Mine Lands Rating Criteria

Hazard Rating (possible score: 0 to 5)	Description/Criteria
5	Any coal mine Vertical shafts, winzes, or underhand collapsed stopes > 6' Irrespirable air Instantaneous fatal injury could occur due to mine-related hazard
4	Large unstable structures Deep pools of water from which it would be difficult to climb out. Potential fatal injury could occur
3	Radiation potential Large stopes overhead - seemingly stable Highwalls > 10' drop-off not apparent from above Serious injury could occur
2	Highwalls > 10' - drop-off apparent from above Rubble around but rock is generally stable Moderate injury could occur
1	Minimal injuries could occur like tripping, bumping head, cutting oneself Highwalls < 10' in area where such drop-offs are common naturally Minimal injury possible
0	No inherent hazards; no injury potential above normal condition
Workings Extensive	If underground mine feature is extensive (i.e., known to have over 500' of workings or multiple levels), 1 point will be added to the total ranking score since complex mines tend to be more hazardous and better wildlife habitat.

Access Rating (likelihood of visitation - possible score: 0 to 5)	Description/Criteria
5	Good road with mine as the specific destination; car accessible
4	Good dirt road, but mine is not specific destination
3	Dirt road or path without specific destination; no car access; easy hiking access < 1 mile
2	Near a road/path (within 1 mile); Easy hike > 5 miles or moderate hike < 5 miles
1	> 1 mile from road/path; Moderate hike > 5 miles or hard hike < 5 miles
0	Hard hike > 5 miles; site not easily seen

Resource Rating (possible score: 0, 2, or 4)	Description/Criteria
4	Endangered species present or site is listed on National or Local Historic Register
2	Species of concern present or site has significant cultural values
0	No species of concern present and site has minimal cultural value

Impacts Rating (possible score: 0, 2, or 4)	Description/Criteria
4	Highly elevated contaminants or greatly altered pH in water/soils; High visual impact
2	Moderately elevated contaminants or pH alteration in water/soils; Moderate visual impact
0	Minimal contaminants or pH alteration in water/soils; Minimal visual impact

| TOTAL RANKING SCORE | Hazard_Rating + Workings Extensive + Access_Rating + Resource_Rating + Impact_Rating (Possible score = 0 to 19) |

National Park Service (NPS) Servicewide Abandoned Mineral Lands (AML) Database
Field Descriptions / Data Dictionary

Field Name	Field Type	Field Description	Comments
Essential Data			SQL Server Data Types: **V = varchar** (variable-length, character data); **I = int** (integer); **F = float** (floating point numeric data); **D = datetime** (date field)
Detail 1		**Note Recovery Act (ARRA) Reporting Fields, pp. 5-6.**	
Detail 2			

SITE / GENERAL

Field Name	Field Type	Field Description	Comments
Region	V	Region	AKR, IMR, MWR, NCR, NER, PWR, SER
Park_Code	V	Park Code	4-character park acronym - e.g., ACAD, DEVA, BISO
Site_Name	V	Site Name	Enter the official name, or if not known, an identifying name (e.g., "Unknown 1," "Grizzly Gulch 1," etc.)
CAMLU_Site_Number	I	CAMLU Site Number **(Field added in 2013)**	California Parks Only - State AML Unit's unique site identification number
Site_Type	V	Site Type	Underground Mine, Surface Mine, Placer Mine, Mill, Well, Road, Underground Mine - Mill, Surface Mine - Mill, Underground-Surface Mine, Underground-Surface Mine - Mill, Other
State	V	State	2-letter postal code (if site crosses state line, pick primary and list other in Site_Notes)
County	V	County	(if more than one county, pick primary and list other in Site_Notes)
Congressional_Dist	V	Congressional District	(often requested in funding proposals - these sometimes change)
Watershed	V	Watershed	Primary watershed name that would be used when partnering with other agencies on major clean-up projects.
Site_Acres	F	Site Acreage	Measure or estimate size of surface disturbance for entire site (tenths of acres used for smaller sites)
Ownership	V	Ownership	Legal ownership: Federal, Private (including patented mining claims), Unpatented (unpatented mining claim), State, County, Other , Unknown
Admin_Use	V	Administrative Use	Yes/No/Unknown - Is the site used administratively by NPS, e.g., sand/gravel quarry for park roads?
FMSS_Loc_ID	I	Location ID	Facility Management Software System Location ID
FMSS_API	I	Asset Priority Index	Facility Management Software System Asset Priority Index (1-100)
FMSS_FCI	F	Facility Condition Index	Facility Management Software System Facility Condition Index (0.000 - X.XXX)
CERCLA	V	CERCLIS #	If this is a CERCLA site, give CERCLIS #. Alphanumeric code starting with State Acronym followed by 10 digits (e.g., AK1231231231)
EDL	V	EDL #	Environmental and Disposal Liabilities database number - DOI list that tracks environmentally contaminated sites (formerly "ECL" - Environmental Cleanup Liabilities database). Alphanumeric code: Bureau Code ("5" for NPS) + Region Code + Site # (1 to 4-digit number) - e.g., 5AR1, 5IMR3161
Compliance_Date	D	Compliance Date (MM/DD/YYYY)	Give date that compliance was completed, and list compliance type (Categorical Exclusion, EA FONSI, or EIS ROD) in Site_Notes.
PEPC	I	5-digit PEPC number	Give PEPC number, or if multiple PEPC numbers were used for various features at this site, list the main one and record others in Site_Notes. PEPC can be used to track NEPA and other compliance requirements, such as NHPA, ESA, wetlands/Section 404 permitting, etc.There is no need to replicate those records in the AML database.
Site_Notes	V	Site Notes	Include other ID numbers from different databases **or additional PEPC numbers** here.

SITE GEOLOGIC RESOURCES

Commod_Gen	V	Commodity (general)	Metals, Coal, Industrial Minerals, Energy Minerals (e.g., Uranium), Stone (building stone and stone products), Sand and Gravel, Oil and Gas, Geothermal, Water, Unknown
Commod_Specif	V	Commodities (specific)	List by chemical symbol (Au, Ag, Cu, Zn, Pb, Fe, U, etc.), mineral name (talc, wollastonite, barite, etc.), rock/stone type (granite, marble, limestone, sandstone, cinders, etc.), or well commodity (oil, gas, geothermal, water, etc.)
Geology_Notes	V	Notes on geology	e.g., Rock Type (igneous/sedimentary/metamorphic, granite/sandstone/schist); Geologic Formation; Orebody Type (vein, disseminated, massive); Ore Type (sulfide, oxide)

SITE NATURAL RESOURCE IMPACTS

NatRes_Impacts	V	Resource impacts in need of mitigation?	Yes/No/Unknown
Effluent	V	Effluent from site?	Yes/No/Unknown
Water	V	Standing water at site?	Yes/No/Unknown
Water_Tail	V	Water flowing through tailings or mineralized waste rock?	Yes/No/Unknown
Stain	V	Staining on soils/rocks?	Yes/No/Unknown
Sediment	V	Sedimentation into surface waters?	Yes/No/Unknown
Vegetation	V	Characterize vegetation on the disturbed area	Healthy, Struggling, Dead, Nonexistent
Est_Waste_Vol	I	Estimated total volume of waste rock on-site (incl. unshipped ore - cubic yards)	Use this field if individual piles are not listed as separate features.
Est_Tail_Vol	I	Estimated total volume of milled tailings on-site (cubic yards)	Use this field if individual piles are not listed as separate features.
Visual	V	How visible is site from where visitors would be?	High/Medium/Low
Other_Impacts	V	Other impacts	An impact that exists that was not mentioned (specify)
Impact_Notes	V	Notes on resource impacts	

SITE - CULTURAL RESOURCES

CultRes_Signif	V	Significant cultural resource values?	Yes/No/Unknown
Register	V	National Register listing or nomination?	Yes/No/Unknown (National Register of Historic Places, National Natural Landmark, National Historic Landmark)
Landscape	V	Has the park declared this a cultural landscape?	Yes/No/Unknown

Eligible	V	Eligible for National Register listing?	Yes/No/Unknown (Is it possible, or has it been determined under a Determination of Eligibility (DOE), that this site is eligible for listing in NRHP, NNL, or NHL?
Interpret	V	Is site interpreted?	Yes/No/Unknown (interpretive sign, brochure, etc.)
Cult_Notes	V	Notes on cultural values	

FEATURE IDENTIFICATION / STATUS - GENERAL

NPS_ID	V	Servicewide Identification Code	**NOT AN INPUT FIELD. GENERATED AUTOMATICALLY BY DATABASE FROM INPUT DATA:** <Park_ID>-<Site_Name>-<Feature_Type>-<number (assigned sequentially by database)> (e.g., DEVA-Skidoo-OS-01, NERI-Kaymore-AD-03). **Unique to each feature.**
Park_ID	V	Park Identification Code	**Park's verbatim in-house identification code.** If park has its own database and nomenclature, we want to be able to link that to the Servicewide Database. Some parks have multiple features listed under one identifier. The Servicewide Database separates these out with a unique NPS_ID for each feature.
Legacy_ID	V	Legacy Identification Code	**Previously-used identification code that has since been changed due to uncovering new information -** When early inventories are updated and information is found that may link a mine more specifically to a particular operation than previously known, or to a different operation, this field preserves the name given in previous surveys, by which some personnel may more commonly know it. Example 1: Ownership previously unknown, so park called a particular solo adit, "Unknown #8" (Legacy_ID). Subsequently, we learn that the Acme Mining Company operated the mine, so now the park calls it "Acme Adit" (Park_ID), and in the Servicewide AML Database, it becomes "PARK-Acme-AD-01" (NPS_ID).
CAMLU_Feature_Number	I	CAMLU Feature Number	California Parks Only - State AML Unit's unique feature identification number
Other_ID	V	Other Identification Code	This field has been added due to demand to track other numbering systems, such as the BLM Mining Claim Number, USGS-USBOM MAS/MILS SEQ number, Smithsonian Trinomial Number, American Petroleum Institute (API) Well #, etc. Please indicate in Feature Notes to which numbering system your Other ID pertains.
Feature_Type	V	Feature Type	Underground Excavations: Adit, Shaft, Incline, Tunnel, Open Stope, Vent Raise, Glory Hole, Subsidence, Prospect. Surface Excavations: Surface Mine, Highwall, Trench. Other Features: Waste Rock, Tailings, Ore Pile, Topsoil Stockpile, Road, Impoundment, Embankment, Building, Structure, Equipment, Well, Hazmat Cache, Artifact Concentration, Trash Pile, Explosives Cache, Other, Unknown (for legacy data only). [SEE DETAILED LIST]
Action_Required	V	Action Required	Yes/No/Unknown - Is action required for this feature other than monitoring and maintenance?
High_Risk	V	High Risk	Yes/No/Unknown - Is this feature "high risk" described in the Director's 10/02/08 memorandum? (Director Bomar's 10/02/08 memorandum was in response to the DOI Inspector General's July 2008 Audit Report of the NPS and BLM AML Programs. The IG called for prompt closure of all "high-risk" sites. Risk is determined by each park based on degree of danger and likelihood of visitation. Suggest "Yes" if Hazard Rating is 3 or more **_AND_** Access Rating is 4 or more.
Source	V		General text field - staff person, literature, etc.
Rev_Date	D	Revision Date (MM/DD/YYYY)	Update this field every time you make a revision. Database provides pop-up date-picker calendar.
Feature _Notes	V	Feature Notes	If "other," describe: e.g., drill hole, trench, arrastra. Use this field for any necessary additional feature description.

FEATURE ACCESS

Method	V	Access Method	Paved Road, Improved Dirt Road, 4WD Road, Hike, Boat, Helicopter
Dist_road	F	Distance from drivable road (tenths of miles)	Straight-line distance if cross-country; distance on path if path is near site
Dist_path	F	Distance from established path (tenths of miles)	If a road is closer than a path, enter the distance from the road.
Published	V	Where is location published	Map (e.g., symbol on USGS topo map, or indicated on other map), Brochure, Book, Internet, **Peer-Reviewed Paper, Gray Literature**, Not Published, Unknown
Wilderness	V	Is feature in designated wilderness	Yes/No/Unknown
Evid_Visit	V	Evidence of visitation	None, Moderate (some trash, footprints), High (lots of trash, etc. or feature is known to have high visitation), Underground Access (graffiti, trash, footprints, etc., within mine workings).
Access_Notes	V	Notes on Access	

FEATURE GEOGRAPHIC DESCRIPTION

Quad	V	Quadrangle Name	USGS Quad Map Name
Lat_ddeg_NAD83	F	Latitude North	**NAD83 decimal degrees - 6 decimal places** (**NOTE:** All new data should be entered in NAD83 LAT/LONG DECIMAL DEGREES, preferably to 6 decimal places if we actually have that degree of accuracy (~ 1 meter). UTM and Public Land Survey System (PLSS: Township/Range/Section) data fields are only to retain historic data where we have not yet updated with recent GPS readings. (Essential only for new entries)
Long_ddeg_NAD83	F	Longitude West	NAD83 decimal degrees - 6 decimal places. (Essential only for new entries)
Elevation	V	Elevation	Feature elevation, given in feet.
Location_Accuracy	V	Location Accuracy	Location Information Accuracy - Differential GPS, Uncorrected GPS, General Site Coordinates, Topo Symbol, Imagery (aerial photo, satellite, etc.), X on map, ¼ Section, Section. (Essential only for new entries)
GPS_Year	I	GPS Year	Year of GPS reading
Aspect	V	Aspect	**Direction of slope where feature is situated.** Lookup Table: N, NE, E, SE, S, SW, W, NW, V (vertical). This can have great significance in predicting potential habitat, particularly in underground mines, e.g., a south-facing shallow adit is unlikely to support hibernation.
Boundary	V	Within park boundary?	Yes/No/Unknown - Within park boundary? (Some sites straddle the park boundary with features inside and outside of the park. Many parks record sites just outside their boundaries that may require management attention / resources. We don't want to lose track of that data, but need to be able to separate them out as not being our ultimate responsibility.)
UTM_N	F	UTM North	UTM Northing (meters)
UTM_E	F	UTM East	UTM Easting (meters)
UTM_Zone	I	UTM Zone	UTM Zone (1 to 60)
Meridian	V	Meridian	Principle Meridian
Township	V	Township	PLSS Township - Enter N or S after number
Range	V	Range	PLSS Range - Enter E or W after number
Section	I	Section	PLSS Section - 1 to 36
Quadrant	V	Quadrant	PLSS Quadrant / quarter-section description - NE, SE, SW, NW

FEATURE DIMENSIONS

Feature_Dim_X	F	Shaft width 1 / Pit width 1 / Adit width / Trench width (feet)	
Feature_Dim_Y	F	Shaft width 2 / Pit width 2 / Adit height / Trench length (feet)	
Feature_Depth	F	Shaft depth / Pit depth / Adit length / Trench depth (feet)	Directly measured, or estimated where direct measurement is not possible. If estimated, enter YES under "Feature Depth Uncertain." If feature is collapsed at the entry, leave this field blank, mark YES for "Feature depth uncertain" and "Feature naturally reclaimed," and mark NO for "Action Required."
Feature_Depth_Uncertain	V	Feature Depth Uncertain	Yes/No/Unknown - Answer "Yes" where mine workings continue out of sight, either because underground entry is not permissible or if full underground survey is not possible due to hazards. Enter "Yes" for deep shafts where estimate has been made by timing how long it takes a dropped rock to hit bottom (Distance (ft) = 0.5 x 32.17 x sec^2), or where a "false bottom" is suspected. Discuss details in Access Notes field.
Distub_Area	F	Area of disturbance around feature (square feet)	Some parks include measurements on the disturbed area immediately surrounding each feature, either by total area (Disturb_Area) or by length x width dimensions (Distub_Length x Disturb_Width). These fields are not to be confused with total site area (Site_Acres), although they may be the same for single-feature sites.
Distub_Area_L	F	Disturbed Area Length (feet)	
Disturb_Area_W	F	Disturbed Area Width (feet)	

FEATURE BIOLOGICAL RESOURCES

BiolRes_Signif	V	Significant biological resource values?	Yes/No/Unknown
Species_TE	V	T & E species present?	Yes/No/Unknown
Species_Concern	V	Other species of concern present?	Yes/No/Unknown (e.g., former Category 2 Species, State-listed species, or significant habitat for common species)
Bats	V	Bats (or evidence of bats) observed?	Yes/No/Unknown (Bats are singled out because they so often determine closure type, making this a good field on which to search.)
Biology_Notes	V	Notes on biological issues present	

FEATURE HAZARDS

Hazards	V	Hazards in need of mitigation?	Yes/No/Unknown
Debris	V	Debris at this feature?	Yes/No/Unknown - Note: Large, discrete piles that merit further characterization can be called out as separate "Trash" features.
Highwall	V	Highwall present?	Yes/No/Unknown
Rockfall	V	Rockfall hazards present, esp. at entry?	Yes/No/Unknown
Fall	V	Falling hazards due to vertical drop-offs present?	Yes/No/Unknown
Flooded	V	Flooded, or evidence of flooding?	Yes/No/Unknown (Flooded shaft, seasonally flooded shaft, or impoundments inside adit that trap water?)

Explosives	V	Explosives present?	Yes/No/Unknown
Bad_Air	V	Bad air present or documented previously?	Yes/No/Unknown [Note that this can change from visit to visit.]
Subsidence	V	Areas of subsidence or collapse?	Yes/No/Unknown (e.g., slump zones on the surface, underground collapses, or slope failure caused by feature)
Fire	V	Evidence of underground fire?	Yes/No/Unknown (Includes coal mine fires, burned timbers, campfire ring, etc. underground)
Hazsub	V	Hazardous substances (other than explosives) present?	Yes/No/Unknown
Haz_Notes	V	Notes on hazards	
FEATURE MITIGATION REQUIRED - SPECIFIC			
Temp_Safe	V	Temporary safing method required	Sign, Fence, Administrative Closure, etc.
Mitig_Opt1	V	Mitigation Option 1	Proposed long-term mitigation technique - OPTION 1 - Reclamation, Bat Gate, Bat Cupola, Bat Culvert, Gate, Grate, **Concrete Cover,** Cablenet, Backfill, PUF, Bulkhead, Fence, Blasting, Structure Removal, Structure Stabilization, Sign, To be determined, Other, No Action. Please explain "Other" and "To be Determined" in Mitig_Req_Notes field.
Opt1_Cost	F	Estimated cost of Option 1	If NEPA is not yet complete, please include a markup to cover NEPA costs (typically an additional 5-10% of the closure cost). If the cost has yet to be determined precisely, please enter your best estimate, or request assistance from your Regional AML Coordinator or the Servicewide AML Coordinator.
Opt1_Cost_Year	I	Year of mitigation cost estimate for Option 1.	
Mitig_Opt2	V	Mitigation Option 2	Proposed long-term mitigation technique - OPTION 1 - Reclamation, Bat Gate, Bat Cupola, Bat Culvert, Gate, Grate, **Concrete Cover,** Cablenet, Backfill, PUF, Bulkhead, Fence, Blasting, Structure Removal, Structure Stabilization, Sign, To be determined, Other, No Action. Please explain "Other" and "To be Determined" in Mitig_Req_Notes field.
Opt2_Cost	F	Estimated cost of Option 2.	If NEPA is not yet complete, please include a markup to cover NEPA costs (typically an additional 5-10% of the closure cost). If the cost has yet to be determined precisely, please enter your best estimate, or request assistance from your Regional AML Coordinator or the Servicewide AML Coordinator.
Opt2_Cost_Year	I	Year of mitigation cost estimate for Option 2.	
PMIS	V	PMIS number	**Recovery Act Reporting Field -** Numeric identifier ***with alpha components included***
FMSS_Asset_ID	I	FMSS Asset ID	Facility Management Software System Asset ID - numeric identifier
Mitig_Req_Notes	V	Notes on mitigation required	Give details (e.g., location of gate 8 feet inside of portal).
FEATURE MITIGATION COMPLETED - SPECIFIC			
Nat_Recl	V	Feature naturally reclaimed?	Yes, No, Unknown - Has this feature naturally reclaimed such that no work is required?
Temp_Safe_Used	V	Temporary safing method used	**Recovery Act Reporting Field -** Sign, Fence, Fence and Sign, Administrative Closure, Other

Temp_Safe_Date	D	Date of temporary closure (MM/DD/YYYY)	Database provides pop-up date-picker calendar.
Mitig_Used	V	Mitigation technique used	**Recovery Act Reporting Field -** Reclamation, Bat Gate, Bat Cupola, Bat Culvert, Gate, Grate, **Concrete Cover,** Cablenet, Backfill, PUF, Bulkhead, Fence, Blasting, Structure Removal, Structure Stabilization, Sign, Other. Please explain "Other" in Mitig_Compl_Notes field.
Mitig_Date	D	Date feature was reclaimed/mitigated (MM/DD/YYYY)	Database provides pop-up date-picker calendar.
Mitig_Cost	F	Cost of mitigation ($)	May need to estimate proportion of multi-opening projects
Mitig_Funds	V	Source of funding	NRPP, Recovery Act (ARRA), Fee Program, GRD, State, Park Base, Region, OSM, Other
Mitig_by	V	Who mitigated the feature?	Who performed the mitigation work? NPS (in-house job), Contractor (NPS-hired contractor), State (State-hired contractor), Other
Partners	V	What partners were used?	Federal, State, Industry, Volunteers, Other (e.g., conservation groups), None
Mitig_Compl_Notes	V	Notes on completed mitigation	(list partners, if applicable)

FEATURE SAMPLE AND RANKING DATA (refer to Ranking System Guide, below)

Water_Samp	V	Was water sampled?	Yes/No/Unknown
pH_Effl	F	pH of effluent (to nearest tenth)	
pH_bg	F	Background pH (to nearest tenth)	
Water_Contam	V	Elevated contaminant levels in the water?	Yes/No/Unknown. If conductivity meter is used, please record levels in Contam_Notes.
Soil_Samp	V	Soils / tailings / waste rock sampled?	Yes/No/Unknown
Soil_Contam	V	Elevated contaminant levels in the soil?	Yes/No/Unknown
Contam_Notes	V	Notes on contamination	If contamination is suspected, please record notes / recommendations.
Hazard_Rating	I	Danger associated with hazards	5/4/3/2/1/0 (See Ranking System Guide, below) [Field required except for legacy data.]
Workings_Extensive	I	Are underground workings extensive (> 500' or multilevel)?	Yes = 1, No = 0 (This adds one point to the total ranking score for more complex fearures.) (See Ranking System Guide) [Field required except for legacy data.]
Access_Rating	I	Difficulty of access	5/4/3/2/1/0 (See Ranking System Guide) (Essential only for new entries) [Field required except for legacy data.]
Resource_Rating	I	Importance of resource	4/2/0 (See Ranking System Guide) (Essential only for new entries) [Field required except for legacy data.]
Impact_Rating	I	Severity of resource impacts	4/2/0 (See Ranking System Guide) (Essential only for new entries) [Field required except for legacy data.]

FEATURE MONITORING			
Monit_Date	D	Monitoring Date (MM/DD/YYYY)	Date of Observation. Database provides pop-up date-picker calendar.
Monit_Observation	V	Monitoring Observation	Notes for each date

Hazard Rating (possible score: 0 to 5)	
5	• Any coal mine • Vertical shafts, winzes, or underhand collapsed stopes > 6' • Irrespirable air • Instantaneous fatal injury could occur due to mine-related hazard
4	• Large unstable structures • Deep pools of water from which it would be difficult to climb out. • Potential fatal injury could occur • Major collapse zones
3	• Radiation potential • Large stopes overhead - seemingly stable • Highwalls > 10' drop-off not apparent from above • Serious injury could occur
2	• Highwalls > 10' - drop-off apparent from above • Rubble around but rock is generally stable • Moderate injury could occur
1	• Minimal injuries could occur like tripping, bumping head, cutting oneself • Highwalls < 10' in area where such drop-offs are common naturally • Minimal injury possible
0	• No inherent hazards; no injury potential above normal condition
Workings Extensive	If underground mine feature is extensive (i.e., known to have over 500' of workings or multiple levels), 1 point will be added to the total ranking score since complex mines tend to be more hazardous and better wildlife habitat.
Access Rating (likelihood of visitation - possible score: 0 to 5)	
5	Good road with mine as the specific destination; car accessible
4	Good dirt road, but mine is not specific destination
3	Dirt road or path without specific destination; no car access; easy hiking access < 1 mile
2	Near a road/path (within 1 mile); Easy hike > 5 miles or moderate hike < 5 miles
1	> 1 mile from road/path; Moderate hike > 5 miles or hard hike < 5 miles
0	Hard hike > 5 miles; site not easily seen
Resource Rating (possible score: 0, 2, or 4)	
4	Endangered species present or site is listed on National or Local Historic Register
2	Species of concern present or site has significant cultural values
0	No species of concern present and site has minimal cultural value
Impacts Rating (possible score: 0, 2, or 4)	
4	Highly elevated contaminants or greatly altered pH in water/soils; High visual impact
2	Moderately elevated contaminants or pH alteration in water/soils; Moderate visual impact
0	Minimal contaminants or pH alteration in water/soils; Minimal visual impact
TOTAL RANKING SCORE	Hazard_Rating + Workings Extensive + Access_Rating + Resource_Rating + Impact_Rating (Possible score = 0 to 19)

USFS CGS AML Inventory

Table - U.S. Forest Service Abandoned Mine Lands Data Fields Summary

Table/Field Name	Description
INVENTORY AREAS	
OBJECTID	OBJECTID - numeric id
UniqueID	UniqueID - concatenated unique key (region, state, forest, ranger district, xutm, yutm, areaid)
REGION	USFS region code
STATE	USFS state code
FOREST	USFS forest code
RGR_DIST	USFS ranger district
UTM_ZONE	UTM zone
XUTM	Inventory X (1000 meter grid)
YUTM	Inventory Y (1000 meter grid)
AREAID	AreaID (Areas within Inventory Areas)
NHOLE	Number of mine featueres in area
NPILE	Number of mine dumps, etc, in area
NWATER	Number of water tests performed in area
SITENAME_1	Site Name 1 (First Alias)
SITENAME_2	Site Name 2 (Second Alias)
MAX_RADS	Maximum radiation measurement
COMMOD_T	Type of commodity mined in the area (e.g. gold, silver, etc.)
QUADNAME	Name of USGS 1:24,000 scale base map (Quad Name)
QUADDATE	Date of USGS 1:24,000 scale base map (Quad Date)
COUNTY	Inventory area county
TWODEGNAME	Name of USGS 1:250,000 scale base map (TwoDegName)
WCU	Water catalog number (EPA defined)
MINE_DIST	Mining district name
QQQ	Quarter/Quarter/Quarter section
SECD	Section number (from USGS topo 1:24,000 map)
TWP	Township number (from USGS topo 1:24,000 map)
TWPD	Township direction (from USGS topo 1:24,000 map)
RGE	Range number (from USGS topo 1:24,000 map)
RGED	Range direction (from USGS topo 1:24,000 map)
NEAR_STRM	Stream name flowing nearest to inventory area
NEXT_STRM	Name of stream into which nearest stream flows into
ELEV	Elevation of inventory area
NEAR_TOWN	Nearest town
DIST_TOWN	Distance to nearest town
NEAR_ROAD	Nearest road
DIST_ROAD	Distance to nearest road
DIST_DWELL	Distant to nearest inhabited dwelling
DIST_CAMP	Distance to nearest campground
DIST_TRAIL	Distance to nearest trail
DIST_OTHER	Distance to other feature
OTHER_DESC	Description of other feature
ACRES	Number of acres reclaimed
HSTGENCMMT	Historical general comment - general comments about historical structures, etc.
RECORDER	Recorder - name of field person and date
Comments	Comments
COMMOD	General commodity mined code (e.g. M = metals, C = coal, etc.)
TERRAIN	Type of terrain (e.g. foothills, mesa, hogback, etc.)
ACCESS_T	Type of access (e.g. T = trail, G = gravel road, etc.)
ACCESS_Q	Quality of access (e.g. G = good, P = poor, etc.)
VEG_DENSE	Vegetation density (e.g. D = dense, M = moderate, etc.)
VEG_T	Vegetation type (e.g. B = barren, G = grass, R = riparian, etc.)
BATS	Evidence of bat activity (e.g. N = No, G = guano, B = bat sighting, etc.)
RECLAIMED	Has any reclamation been performed in the area?
HIST_STR	Are there any historical structures in the inventory area?
Slope	General slope of inventory area (e.g. 0-10, 11-35, >35)
ENVIRO_HAZARD	Environmental hazard rating
PHYSICAL_HAZARD	Physical hazard rating
AREA	Outer boundary of the inventory area
MINE OPENINGS	
OBJECTID	OBJECTID - numeric id
REGION	USFS region code
STATE	USFS state code
FOREST	USFS forest code
RGR_DIST	USFS ranger district
UTM_ZONE	UTM zone
XUTM	Opening X (1000 meter grid)
YUTM	Opening Y (1000 meter grid)
AREAID	AreaID (Areas within Inventory Areas)
HID	Hole identification id (unique for every mine opening - 100 thru 199)
HTYPE	Type of mine opening (e.g. A= adit, S = veritical shaft, ST = stope, etc.)
HEIGHT	Height of opening

Table - U.S. Forest Service Abandoned Mine Lands Data Fields Summary

Table/Field Name	Description
WIDTH	Width of opening
DEPTH	Depth of opening
Unique_ID	UniqueID - concatenated unique key + hole identification number (region, state, forest, ranger district, xutm, yutm, areaid)
DEPTH_MOD	Depth description modifier (boolean indicator if depth cannot be accurately estimated)
CONDITION	Condition of the mine opening (e.g. F = filled/collapsed, etc.)
DRAINAGE	Description of water draining from the mine opening (e.g. W = water draining, etc.)
RADS	Radiation counts measured at or near mine opening
DETER_T	Type of access deterrent installed at mine opening (e.g. S = sign, C = capped/sealed, etc.)
DETER_C	Condition of access deterrent installed at mine opening (e.g. P = prevents access, etc.)
ENV_RATING	Rating of environmental degradation attributable to mine opening/activities
HAZ_RATING	Rating of physical hazard posed to human life by mine opening
ROLL	Film roll identifier used to photograph mine opening
FRAME	Frame number(s) of mine opening photographs
COMMENTS	Extended comments describing mine opening

MINE PILES	
OBJECTID	OBJECTID - numeric id
REGION	USFS region code
STATE	USFS state code
FOREST	USFS forest code
RGR_DST	USFS rgr_dst code
UTM_ZONE	USFS utm_zone code
XUTM	USFS xutm code
YUTM	USFS yutm code
AREAID	AreaID (Areas within Inventory Areas)
PID	Pile Idenfication ID (unique pile id assigned to each mine waste or tailings pile, usually 200 to 299)
LENGTH	Length of the long dimesion of the mine dump
WIDTH	Width of the shorter dimension of the mine dump
VOLUME	Estimated volume of the mine dump material
SLOPE_ANG	Steepest slope angle of the mine dump material
SLOPE_LNTH	Length of the steepest slope area of mine dump
RADS	Radiation counts measured at or near mine dump
ROLL	Film roll identifier used to photograph mine dump
FRAME	Frame number(s) of mine dump photos
PTYPE	Type of mine dump (e.g. D = mine dump, T = mill tailings, P = processing site, etc.)
MAT_SIZE	Grain size(s) of material in mine dump.
CEMENT	Degree of cementation of mine dump materials (e.g. W = well cemented, U = uncemented, etc.)
VEG	Types of vegetation on or around mine dump (e.g. G = mixed grass, P = pine/spruce, etc.)
VEG_D	Vegetation density (e.g. D = dense, M = moderate, etc.)
DRAINAGE	Type of water drainage occurring on or around the mine dump (W = water draining across surface, etc.)
STABILITY	Estimated stability of the mine dump (e.g. U = unstable, S = stable, etc.)
NORMAL_EROD	Types of erosion affecting mine dump during normal precipitation (e.g. R = rills, G = gullies, etc.)
WIND_EROD	Desciption of susceptibility of mine dump to wind erosions (e.g. N= none, D= dunes, etc.)
RAD_UNITS	Radiation measurement units
DETER_T	Type of access deterrent installed at mine dump (e.g. F = fence, G = open grill, etc.)
DETER_C	Condition of access deterrent installed at mine dump
ENV_RATING	Rating of environmental degradation attributable to mine dump
HAZ_RATING	Rating of physical hazard posed to human life by activities/structures related to construction/development of mine dump
STORM_EROD	Erosoinal susceptibiility of the dump site during to storm events (e.g. C = in contact with normal stream, etc.)
Unique_ID	UniqueID - concatenated unique key + pile identification number (region, state, forest, ranger district, xutm, yutm, areaid)
COMMENTS	Extended comments describing the mine dump and other information
Photo_ID	Photo identification number

WATER	
OBJECTID	OBJECTID - numeric id
REGION	USFS region code
STATE	USFS state code
FOREST	USFS forest code
RGR_DIST	USFS rgr_dst code
UTM_ZONE	USFS utm_zone code
XUTM	USFS xutm code
YUTM	USFS yutm code
AREAID	AreaID (Areas within Inventory Areas)
WID	Unique water id assigned to each water test/sample, values range from 300-399
PH	pH value of the water measured in the field
CONDUCT	Specific conductance of the water (mS/cm)
CFS	Water discharge in gallons per minute (that's right, in gpm NOT cfs)
CFS_DATE	Date water discharge was measured
DIST_STR	Distance from the water test and/or sample location to receiving stream (ft)
UTM_X_83	NAD83 X coord

Table - U.S. Forest Service Abandoned Mine Lands Data Fields Summary

Table/Field Name	Description
UTM_Y_83	NAD83 Y coord
SAMPLE_LOC	Location where water data was obtained in relation to the mine featuere (e.g. A = immediately adjacent to adit/shaft, B = below dump/tailings, etc.)
CFS_METHOD	Method of measuring water discharge (e.g. E = estimate, W = weir, L = flume, etc.)
ETSD	Evidence of toxicity in site drainage (e.g. W = opaque water, P = yellow/red precipitate, etc)
ETRS	Evidence of toxicity in the closest receiving stream to the mine feature (W = opaque water, D = salt deposits, etc.)
FID	Feature id of the mine opening or dump where the water sample was taken (usually 100-199 or 200-299)
Unique_ID	UniqueID - concatenated unique key + water identification number (region, state, forest, ranger district, xutm, yutm, areaid)
COMMENTS	Extended comments describing the water test and other information

PHOTO POINTS

Table/Field Name	Description
OBJECTID_1	OBJECTID - numeric id
NF	National Forest Name
ROLL	Film roll
FRAME	Frame number
DATE_	Date photo taken
SITE	Site name
FEATURE	Feature area number
NOTE_	Notes on picture
Feature _1	Feature ID number
PhotoID	PhoteID number

PHOTO FINAL

Table/Field Name	Description
OBJECTID	OBJECTID - numeric id
REGION	USFS region code
STATE	USFS state code
FOREST	USFS forest code
RGR_DIST	USFS rgr_dst code
UTM_ZONE	USFS utm_zone code
UniqueID	UniqueID - concatenated unique key (region, state, forest, ranger district, xutm, yutm, areaid)
NF	National Forest Name
ROLL	Roll name
FRAME	Frame number
DATE_	Date
SITE	Site name
FEATURE	Feature name
NOTE_	Photo notes
Feature_1	Feature ID number
PhotoID	Photo ID number

SAMPLES

Table/Field Name	Description
OBJECTID	OBJECTID - numeric id
REGION	USFS region code
STATE	USFS state code
FOREST	USFS forest code
RGR_DIST	USFS rgr_dst code
UTM_ZONE	USFS utm_zone code
XUTM	USFS xutm code
YUTM	USFS yutm code
AREAID	AreaID (Areas within Inventory Areas)
SID	Unique water sample id assigned to each water sample
RANGER_DIS	Ranger district name
BASIN	Drainage basin name (only completed for the Columbine Ranger District)
SITE_DESCR	Site description of the sample site
SITE_ALIAS	A secondary or alternative description of the sample site
SAMPLED_DA	Date water sample was collected (mm/dd/yyyy).
LAB_RECEIV	Date the laboratory received the water sample (mm/dd/yyyy)
TIME_24HR	Time of day water sample was collected (military time - ##:##)
AGENCY	Entity for which sample was performed
COMMENT	Description of the physical sample location, type of sanple, and any factors that may affect the analysis results
TYPE	Type of water source from which the water sample was taken (e.g. adit, shaft, portal, leachate, dum seep, stream, lake, etc.)
LABORATORY	Name of lab (e.g. CDPHE/ICL, USGSBGC, etc.)
SAMPLER	Entity performing the sampling (e.g. CGS, CDH, etc.)
LAT_DD	Latitude in decimel degrees
LONG_DD	Longitude in decimel degrees
ELEV_FT	Elevation of sample location in feet
UNIQUE_ID	Concatenated key to link with water hole or pile record
FLOW_CFS	Water discharge in cfs
ESQ_Q_GPM	Water discarge in gpm
MOD_Q_GPI	Modifier for water discharge measurement (E = estimated, M = measured, etc.)
STANDING_W	Indicates wheter water tested was standing water (0 = sample not from standing water, etc.)

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XUTM	Inventory X (1000 meter grid)
YUTM	Inventory Y (1000 meter grid)
AREAID	AreaID (Areas within Inventory Areas)
NHOLE	Number of mine featueres in area
NPILE	Number of mine dumps, etc, in area
NWATER	Number of water tests performed in area
SITENAME_1	Site Name 1 (First Alias)
SITENAME_2	Site Name 2 (Second Alias)
MAX_RADS	Maximum radiation measurement
COMMOD_T	Type of commodity mined in the area (e.g. gold, silver, etc.)
QUADNAME	Name of USGS 1:24,000 scale base map (Quad Name)
QUADDATE	Date of USGS 1:24,000 scale base map (Quad Date)
COUNTY	Inventory area county
TWODEGNAME	Name of USGS 1:250,000 scale base map (TwoDegName)
WCU	Water catalog number (EPA defined)
MINE_DIST	Mining district name
QQQ	Quarter/Quarter/Quarter section
SECD	Section number (from USGS topo 1:24,000 map)
TWP	Township number (from USGS topo 1:24,000 map)
TWPD	Township direction (from USGS topo 1:24,000 map)
RGE	Range number (from USGS topo 1:24,000 map)
RGED	Range direction (from USGS topo 1:24,000 map)
NEAR_STRM	Stream name flowing nearest to inventory area
NEXT_STRM	Name of stream into which nearest stream flows into
ELEV	Elevation of inventory area
NEAR_TOWN	Nearest town
DIST_TOWN	Distance to nearest town
NEAR_ROAD	Nearest road
DIST_ROAD	Distance to nearest road
DIST_DWELL	Distant to nearest inhabited dwelling
DIST_CAMP	Distance to nearest campground
DIST_TRAIL	Distance to nearest trail
DIST_OTHER	Distance to other feature
OTHER_DESC	Description of other feature
ACRES	Number of acres reclaimed
HSTGENCMMT	Historical general comment - general comments about historical structures, etc.
RECORDER	Recorder - name of field person and date
Comments	Comments
COMMOD	General commodity mined code (e.g. M = metals, C = coal, etc.)
TERRAIN	Type of terrain (e.g. foothills, mesa, hogback, etc.)
ACCESS_T	Type of access (e.g. T = trail, G = gravel road, etc.)
ACCESS_Q	Quality of access (e.g. G = good, P = poor, etc.)
VEG_DENSE	Vegetation density (e.g. D = dense, M = moderate, etc.)
VEG_T	Vegetation type (e.g. B = barren, G = grass, R = riparian, etc.)
BATS	Evidence of bat activity (e.g. N = No, G = guano, B = bat sighting, etc.)
RECLAIMED	Has any reclamation been performed in the area?
HIST_STR	Are there any historical structures in the inventory area?
Slope	General slope of inventory area (e.g. 0-10, 11-35, >35)
ENVIRO_HAZARD	Environmental hazard rating
PHYSICAL_HAZARD	Physical hazard rating
AREA	Outer boundary of the inventory area
MINE OPENINGS	
OBJECTID	OBJECTID - numeric id
REGION	USFS region code
STATE	USFS state code
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RGR_DIST	USFS ranger district
UTM_ZONE	UTM zone
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YUTM	Opening Y (1000 meter grid)
AREAID	AreaID (Areas within Inventory Areas)
HID	Hole identification id (unique for every mine opening - 100 thru 199)
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ROLL	Film roll identifier used to photograph mine opening
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MINE PILES	
OBJECTID	OBJECTID - numeric id
REGION	USFS region code
STATE	USFS state code
FOREST	USFS forest code
RGR_DST	USFS rgr_dst code
UTM_ZONE	USFS utm_zone code
XUTM	USFS xutm code
YUTM	USFS yutm code
AREAID	AreaID (Areas within Inventory Areas)
PID	Pile Idenfication ID (unique pile id assigned to each mine waste or tailings pile, usually 200 to 299)
LENGTH	Length of the long dimesion of the mine dump
WIDTH	Width of the shorter dimension of the mine dump
VOLUME	Estimated volume of the mine dump material
SLOPE_ANG	Steepest slope angle of the mine dump material
SLOPE_LNTH	Length of the steepest slope area of mine dump
RADS	Radiation counts measured at or near mine dump
ROLL	Film roll identifier used to photograph mine dump
FRAME	Frame number(s) of mine dump photos
PTYPE	Type of mine dump (e.g. D = mine dump, T = mill tailings, P = processing site, etc.)
MAT_SIZE	Grain size(s) of material in mine dump.
CEMENT	Degree of cementation of mine dump materials (e.g. W = well cemented, U = uncemented, etc.)
VEG	Types of vegetation on or around mine dump (e.g. G = mixed grass, P = pine/spruce, etc.)
VEG_D	Vegetation density (e.g. D = dense, M = moderate, etc.)
DRAINAGE	Type of water drainage occurring on or around the mine dump (W = water draining across surface, etc.)
STABILITY	Estimated stability of the mine dump (e.g. U = unstable, S = stable, etc.)
NORMAL_EROD	Types of erosion affecting mine dump during normal precipitation (e.g. R = rills, G = gullies, etc.)
WIND_EROD	Desciption of susceptibility of mine dump to wind erosions (e.g. N= none, D= dunes, etc.)
RAD_UNITS	Radiation measurement units
DETER_T	Type of access deterrent installed at mine dump (e.g. F = fence, G = open grill, etc.)
DETER_C	Condition of access deterrent installed at mine dump
ENV_RATING	Rating of environmental degradation attributable to mine dump
HAZ_RATING	Rating of physical hazard posed to human life by activities/structures related to construction/development of mine dump
STORM_EROD	Erosoinal susceptibiility of the dump site during to storm events (e.g. C = in contact with normal stream, etc.)
Unique_ID	UniqueID - concatenated unique key + pile identification number (region, state, forest, ranger district, xutm, yutm, areaid)
COMMENTS	Extended comments describing the mine dump and other information
Photo_ID	Photo identification number

WATER	
OBJECTID	OBJECTID - numeric id
REGION	USFS region code
STATE	USFS state code
FOREST	USFS forest code
RGR_DIST	USFS rgr_dst code
UTM_ZONE	USFS utm_zone code
XUTM	USFS xutm code
YUTM	USFS yutm code
AREAID	AreaID (Areas within Inventory Areas)
WID	Unique water id assigned to each water test/sample, values range from 300-399
PH	pH value of the water measured in the field
CONDUCT	Specific conductance of the water (mS/cm)
CFS	Water discharge in gallons per minute (that's right, in gpm NOT cfs)
CFS_DATE	Date water discharge was measured
DIST_STR	Distance from the water test and/or sample location to receiving stream (ft)
UTM_X_83	NAD83 X coord

Table - U.S. Forest Service Abandoned Mine Lands Data Fields Summary

Table/Field Name	Description
UTM_Y_83	NAD83 Y coord
SAMPLE_LOC	Location where water data was obtained in relation to the mine featuere (e.g. A = immediately adjacent to adit/shaft, B = below dump/tailings, etc.)
CFS_METHOD	Method of measuring water discharge (e.g. E = estimate, W = weir, L = flume, etc.)
ETSD	Evidence of toxicity in site drainage (e.g. W = opaque water, P = yellow/red precipitate, etc)
ETRS	Evidence of toxicity in the closest receiving stream to the mine feature (W = opaque water, D = salt deposits, etc.)
FID	Feature id of the mine opening or dump where the water sample was taken (usually 100-199 or 200-299)
Unique_ID	UniqueID - concatenated unique key + water identification number (region, state, forest, ranger district, xutm, yutm, areaid)
COMMENTS	Extended comments describing the water test and other information

PHOTO POINTS

Table/Field Name	Description
OBJECTID_1	OBJECTID - numeric id
NF	National Forest Name
ROLL	Film roll
FRAME	Frame number
DATE_	Date photo taken
SITE	Site name
FEATURE	Feature area number
NOTE_	Notes on picture
Feature _1	Feature ID number
PhotoID	PhoteID number

PHOTO FINAL

Table/Field Name	Description
OBJECTID	OBJECTID - numeric id
REGION	USFS region code
STATE	USFS state code
FOREST	USFS forest code
RGR_DIST	USFS rgr_dst code
UTM_ZONE	USFS utm_zone code
UniqueID	UniqueID - concatenated unique key (region, state, forest, ranger district, xutm, yutm, areaid)
NF	National Forest Name
ROLL	Roll name
FRAME	Frame number
DATE_	Date
SITE	Site name
FEATURE	Feature name
NOTE_	Photo notes
Feature_1	Feature ID number
PhotoID	Photo ID number

SAMPLES

Table/Field Name	Description
OBJECTID	OBJECTID - numeric id
REGION	USFS region code
STATE	USFS state code
FOREST	USFS forest code
RGR_DIST	USFS rgr_dst code
UTM_ZONE	USFS utm_zone code
XUTM	USFS xutm code
YUTM	USFS yutm code
AREAID	AreaID (Areas within Inventory Areas)
SID	Unique water sample id assigned to each water sample
RANGER_DIS	Ranger district name
BASIN	Drainage basin name (only completed for the Columbine Ranger District)
SITE_DESCR	Site description of the sample site
SITE_ALIAS	A secondary or alternative description of the sample site
SAMPLED_DA	Date water sample was collected (mm/dd/yyyy).
LAB_RECEIV	Date the laboratory received the water sample (mm/dd/yyyy)
TIME_24HR	Time of day water sample was collected (military time - ##:##)
AGENCY	Entity for which sample was performed
COMMENT	Description of the physical sample location, type of sanple, and any factors that may affect the analysis results
TYPE	Type of water source from which the water sample was taken (e.g. adit, shaft, portal, leachate, dum seep, stream, lake, etc.)
LABORATORY	Name of lab (e.g. CDPHE/ICL, USGSBGC, etc.)
SAMPLER	Entity performing the sampling (e.g. CGS, CDH, etc.)
LAT_DD	Latitude in decimel degrees
LONG_DD	Longitude in decimel degrees
ELEV_FT	Elevation of sample location in feet
UNIQUE_ID	Concatenated key to link with water hole or pile record
FLOW_CFS	Water discharge in cfs
ESQ_Q_GPM	Water discarge in gpm
MOD_Q_GPI	Modifier for water discharge measurement (E = estimated, M = measured, etc.)
STANDING_W	Indicates wheter water tested was standing water (0 = sample not from standing water, etc.)

Table - U.S. Forest Service Abandoned Mine Lands Data Fields Summary

| Table/Field Name	Description
STREAM_DES	Streambed sample location description.
WATER_DESC	Description of water at sample location.
FIELD_PH	pH measured in the field.
LAB_PH	pH measured in the lab.
TEMP_C	Temp of sample measured in the field (degrees C).
FIELD_COND	Field specific conductance (mS/cm).
MOD_COND	Conductivity modifier (only value is "-" or below instrument sensitivity.
LAB_COND	Lab specific conductance (mS/cm).
DIS_OXY_MG	Field measured dissolved oxygen (mg/L).
MOD_DIS_OX	Modifer for field measured dissolved oxygen ("-" = below instrument sensitivity, etc.).
HARD_MG	Lab hardness (mg/L CaCO3 equivalent).
MOD_HARD	Modifier for lab harness ("-" = below instrument sensitivity, etc.).
FIELD_ALK_	Field alkalinity (mg/L).
FIELD_MOD_	Modifer for field alkalinity ("-" = below instrument sensitivity, etc.).
LAB_ALK_MG	Lab measured alkalinity (mg/L).
LAB_MOD_AL	Modifer for lab alkalinity ("-" = below instrument sensitivity, etc.).
ACIDITY	Lab measured acidity (mg/L).
CA_TOT_MG	Lab Measured Total Recoverable Calcium (mg/L).
MOD_CA_TOT	Modifier for Total Recoverable Calcium ("-" = below instrument sensitivity, etc.).
CA_DIS_MG	Lab Measured Dissolved Calcium (mg/L) - field filtered with 0.45 micron filter.
MOD_CA_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
MG_TOT_MG	Lab Measured Total Recoverable Magnesium (mg/L).
MOD_MG_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
MG_DIS_MG	Lab Measured Dissolved Magnesium (mg/L) - field filtered with 0.45 micron filter.
MOD_MG_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
AL_TOT	Lab Measured Total Recoverable Aluminum (ug/L).
MOD_AL_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
AL_DIS	Lab Measured Dissolved Aluminum (ug/L) - field filtered with 0.45 micron filter.
MOD_AL_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
AG_TOT	Lab Measured total recoverable silver (ug/L).
MOD_AG_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
AG_DIS	Lab Measured Dissolved Silver (ug/L) - field filtered with 0.45 micron filter.
MOD_AG_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
AS_TOT	Lab Measured total recoverable Arsenic (ug/L).
MOD_AS_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
AS_DIS	Lab Measured Dissolved Arsenic (ug/L) - field filtered with 0.45 micron filter.
MOD_AS_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
AU_DIS	Lab Measured Dissolved Gold (ug/L) - field filtered with 0.45 micron filter.
MOD_AU_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
B_TOT	Lab Measured total recoverable boron (ug/L).
MOD_B_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
B_DIS	Lab Measured Dissolved Boron (ug/L) - field filtered with 0.45 micron filter.
MOD_B_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
BR	Lab measured dissolved bromine (mg/L).
MOD_BR	Modifier for analyte ("-" - below instrument sensitivity, etc.).
SB_TOT	Lab Measured total recoverable Antimony (ug/L).
MOD_SB_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
SB_DIS	Lab Measured Dissolved Antimony (ug/L) - field filtered with 0.45 micron filter.
MOD_SB_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
BA_TOT	Lab Measured total recoverable barium (ug/L).
MOD_BA_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
BA_DIS	Lab Measured Dissolved Barium (ug/L) - field filtered with 0.45 micron filter.
MOD_BA_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
BE_TOT	Lab Measured total recoverable Beryllium (ug/L).
MOD_BE_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
BE_DIS	Lab Measured Dissolved Beryllium (ug/L) - field filtered with 0.45 micron filter.
MOD_BE_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
CO_TOT	Lab measured total recoverab le cobalt (ug/L).
MOD_CO_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
CO_DIS	Lab measured dissolved cobalt (ug/L).
MOD_CO_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
CD_TOT	Lab measured total recoverable cadmium (ug/L).
MOD_CD_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
CD_DIS	Lab Measured Dissolved Cadmium (ug/L) - field filtered with 0.45 micron filter.
MOD_CD_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
CU_TOT	Lab measured total recoverable copper (ug/L).
MOD_CU_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
CU_DIS	Lab Measured Dissolved Copper (ug/L) - field filtered with 0.45 micron filter.
MOD_CU_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
CR_TOT	Lab measured total recoverable chromium (ug/L).
MOD_CR_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
CR_DIS	Lab Measured Dissolved Chromium (ug/L) - field filtered with 0.45 micron filter.
MOD_CR_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).

Table - U.S. Forest Service Abandoned Mine Lands Data Fields Summary

Table/Field Name	Description
STREAM_DES	Streambed sample location description.
WATER_DESC	Description of water at sample location.
FIELD_PH	pH measured in the field.
LAB_PH	pH measured in the lab.
TEMP_C	Temp of sample measured in the field (degrees C).
FIELD_COND	Field specific conductance (mS/cm).
MOD_COND	Conductivity modifier (only value is "-" or below instrument sensitivity.
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DIS_OXY_MG	Field measured dissolved oxygen (mg/L).
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HARD_MG	Lab hardness (mg/L CaCO3 equivalent).
MOD_HARD	Modifier for lab harness ("-" = below instrument sensitivity, etc.).
FIELD_ALK_	Field alkalinity (mg/L).
FIELD_MOD_	Modifer for field alkalinity ("-" = below instrument sensitivity, etc.).
LAB_ALK_MG	Lab measured alkalinity (mg/L).
LAB_MOD_AL	Modifer for lab alkalinity ("-" = below instrument sensitivity, etc.).
ACIDITY	Lab measured acidity (mg/L).
CA_TOT_MG	Lab Measured Total Recoverable Calcium (mg/L).
MOD_CA_TOT	Modifier for Total Recoverable Calcium ("-" = below instrument sensitivity, etc.).
CA_DIS_MG	Lab Measured Dissolved Calcium (mg/L) - field filtered with 0.45 micron filter.
MOD_CA_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
MG_TOT_MG	Lab Measured Total Recoverable Magnesium (mg/L).
MOD_MG_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
MG_DIS_MG	Lab Measured Dissolved Magnesium (mg/L) - field filtered with 0.45 micron filter.
MOD_MG_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
AL_TOT	Lab Measured Total Recoverable Aluminum (ug/L).
MOD_AL_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
AL_DIS	Lab Measured Dissolved Aluminum (ug/L) - field filtered with 0.45 micron filter.
MOD_AL_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
AG_TOT	Lab Measured total recoverable silver (ug/L).
MOD_AG_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
AG_DIS	Lab Measured Dissolved Silver (ug/L) - field filtered with 0.45 micron filter.
MOD_AG_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
AS_TOT	Lab Measured total recoverable Arsenic (ug/L).
MOD_AS_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
AS_DIS	Lab Measured Dissolved Arsenic (ug/L) - field filtered with 0.45 micron filter.
MOD_AS_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
AU_DIS	Lab Measured Dissolved Gold (ug/L) - field filtered with 0.45 micron filter.
MOD_AU_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
B_TOT	Lab Measured total recoverable boron (ug/L).
MOD_B_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
B_DIS	Lab Measured Dissolved Boron (ug/L) - field filtered with 0.45 micron filter.
MOD_B_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
BR	Lab measured dissolved bromine (mg/L).
MOD_BR	Modifier for analyte ("-" - below instrument sensitivity, etc.).
SB_TOT	Lab Measured total recoverable Antimony (ug/L).
MOD_SB_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
SB_DIS	Lab Measured Dissolved Antimony (ug/L) - field filtered with 0.45 micron filter.
MOD_SB_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
BA_TOT	Lab Measured total recoverable barium (ug/L).
MOD_BA_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
BA_DIS	Lab Measured Dissolved Barium (ug/L) - field filtered with 0.45 micron filter.
MOD_BA_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
BE_TOT	Lab Measured total recoverable Beryllium (ug/L).
MOD_BE_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
BE_DIS	Lab Measured Dissolved Beryllium (ug/L) - field filtered with 0.45 micron filter.
MOD_BE_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
CO_TOT	Lab measured total recoverab le cobalt (ug/L).
MOD_CO_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
CO_DIS	Lab measured dissolved cobalt (ug/L).
MOD_CO_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
CD_TOT	Lab measured total recoverable cadmium (ug/L).
MOD_CD_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
CD_DIS	Lab Measured Dissolved Cadmium (ug/L) - field filtered with 0.45 micron filter.
MOD_CD_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
CU_TOT	Lab measured total recoverable copper (ug/L).
MOD_CU_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
CU_DIS	Lab Measured Dissolved Copper (ug/L) - field filtered with 0.45 micron filter.
MOD_CU_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
CR_TOT	Lab measured total recoverable chromium (ug/L).
MOD_CR_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
CR_DIS	Lab Measured Dissolved Chromium (ug/L) - field filtered with 0.45 micron filter.
MOD_CR_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).

Table - U.S. Forest Service Abandoned Mine Lands Data Fields Summary

Table/Field Name	Description
CN_TOT_MG	Lab measured total recoverable cyanide (mg/L).
MOD_CN_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
FE_TOT	Lab measured total recoverable iron (ug/L).
MOD_FE_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
FE_DIS	Lab Measured Dissolved Iron (ug/L) - field filtered with 0.45 micron filter.
MOD_FE_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
GA_TOT	Lab measured total recoverable gallium (ug/L).
MOD_GA_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
GA_DIS	Lab Measured Dissolved Gallium (ug/L) - field filtered with 0.45 micron filter.
MOD_GA_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
GE_TOT	Lab measured total recoverable germanium (ug/L).
MOD_GE_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
GE_DIS	Lab Measured Dissolved Germanium (ug/L) - field filtered with 0.45 micron filter.
MOD_GE_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
HG_TOT	Lab measured total recoverable mercury (ug/L).
MOD_HG_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
HG_DIS	Lab Measured Dissolved Mercury (ug/L) - field filtered with 0.45 micron filter.
MOD_HG_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
LI_TOT	Lab measured total recoverable lithium (ug/L).
MOD_LI_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
LI_DIS	Lab Measured Dissolved Lithium (ug/L) - field filtered with 0.45 micron filter.
MOD_LI_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
MO_TOT	Lab measured total recoverable molybdenum (ug/L).
MOD_MO_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
MO_DIS	Lab Measured Dissolved Molybdenum (ug/L) - field filtered with 0.45 micron filter.
MOD_MO_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
MN_TOT	Lab measured total recoverable manganese (ug/L).
MOD_MN_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
MN_DIS	Lab Measured Dissolved Manganese (ug/L) - field filtered with 0.45 micron filter.
MOD_MN_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
NI_TOT	Lab measured total recoverable nickel (ug/L).
MOD_NI_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
NI_DIS	Lab Measured Dissolved Nickel (ug/L) - field filtered with 0.45 micron filter.
MOD_NI_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
PB_TOT	Lab measured total recoverable lead (ug/L).
MOD_PB_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).
PB_DIS	Lab Measured Dissolved Lead (ug/L) - field filtered with 0.45 micron filter.
MOD_PB_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).
SE_TOT	Lab measured total recoverable selenium (ug/L).
MOD_SE_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.)
SE_DIS	Lab Measured Dissolved Selenium (ug/L) - field filtered with 0.45 micron filter
MOD_SE_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.)
SN_TOT	Lab measured total recoverable tin (ug/L)
MOD_SN_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.)
SN_DIS	Lab Measured Dissolved Tin (ug/L) - field filtered with 0.45 micron filter
MOD_SN_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.)
SR_TOT	Lab measured total recoverable strontium (ug/L)
MOD_SR_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.)
SR_DIS	Lab Measured Dissolved Strontium (ug/L) - field filtered with 0.45 micron filter
MOD_SR_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.)
TH_TOT	Lab measured total recoveable thorium (ug/L)
MOD_TH_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.)
TH_DIS	Lab Measured Dissolved Thorium (ug/L) - field filtered with 0.45 micron filter
MOD_TH_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.)
TI_TOT	Lab measured total reoverable titanium (ug/L)
MOD_TI_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.)
TI_DIS	Lab Measured Dissolved Titanium (ug/L) - field filtered with 0.45 micron filter
MOD_TI_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.)
TL_TOT	Lab measured total recoverable thallium (ug/L)
MOD_TL_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.)
TL_DIS	Lab Measured Dissolved Thallium (ug/L) - field filtered with 0.45 micron filter
MOD_TL_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.)
U_DIS	Lab Measured Dissolved Uranium (ug/L) - field filtered with 0.45 micron filter
U_DIS_PCI_	Lab measured dissolved Uranium (pC/L) - field filtered with 0.45 micron fileter
MOD_U_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.)
U_TOT	Lab measured total recoverable uranium (ug/L)
MOD_U_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.)
V_TOT	Lab measured total recoverable vanadium (ug/L)
MOD_V_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.)
V_DIS	Lab Measured Dissolved Vanadium (ug/L) - field filtered with 0.45 micron filter
MOD_V_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.)
ZN_TOT	Lab measured total recoverable zinc (ug/L)
MOD_ZN_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.)

Table - U.S. Forest Service Abandoned Mine Lands Data Fields Summary

Table/Field Name	Description
ZN_DIS	Lab Measured Dissolved Zinc (ug/L) - field filtered with 0.45 micron filter
MOD_ZN_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.)
ZR_TOT	Lab measured total reoverable zirconium (ug/L)
MOD_ZR_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.)
ZR_DIS	Lab Measured Dissolved Zirconium (ug/L) - field filtered with 0.45 micron filter
MOD_ZR_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.)
TSS_MG	Lab measured total suspended solids (mg/L)
MOD_TSS	Modifier for analyte ("-" - below instrument sensitivity, etc.)
TDS_MG	Lab measured total dissolved solids (mg/L)
MOD_TDS	Modifier for analyte ("-" - below instrument sensitivity, etc.)
T_PHOS_MG	Lab measured total recoverable phosphorus (mg/L)
MOD_T_PHOS	Modifier for analyte ("-" - below instrument sensitivity, etc.)
P_DIS_MG	Lab measured dissolved phospohorus (mg/L)
MOD_P_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.)
PO4_DIS_MG	Laboratory measured dissolved phosphate (mg/L)
MOD_PO4_DI	Modifier for analyte ("-" - below instrument sensitivity, etc.)
SI_TOT_MG	Laboratory measured total recoverable silicon (mg/L)
MOD_SI_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.)
SI_DIS_MG	Laboratory measured dissoved silicon (mg/L)
MOD_SI_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.)
NA_TOT_MG	Laboratory measured total recoverable sodium (mg/L)
MOD_NA_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.)
NA_DIS_MG	Laboratory measured dissolved sodium (mg/L)
MOD_NA_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.)
CL_MG	Laboratory measured dissoved chlorine (mg/L)
MOD_CL	Modifier for analyte ("-" - below instrument sensitivity, etc.)
F_MG	Laboratory measured dissoved fluorine (mg/L)
MOD_F	Modifier for analyte ("-" - below instrument sensitivity, etc.)
BR_MG	Laboratory measured dissolved bromine (mg/L)
MOD_BR_MG	Modifier for analyte ("-" - below instrument sensitivity, etc.)
HCO3_MG	Laboratory measured dissolved bicarbonate (mg/L)
MOD_HCO3	Modifier for analyte ("-" - below instrument sensitivity, etc.)
CO3_MG	Laboratory measured dissoved carbonate (mg/L)
MOD_CO3	Modifier for analyte ("-" - below instrument sensitivity, etc.)
OH_MG	Laboratory measured dissolved hydroxide (mg/L)
MOD_OH	Modifier for analyte ("-" - below instrument sensitivity, etc.)
NH3_MG	Laboratory measured dissolved ammonia (mg/L)
MOD_NH3_MG	Modifier for analyte ("-" - below instrument sensitivity, etc.)
NO2_MG	Laboratory measured dissolved nitrite (mg/L)
MOD_NO2	Modifier for analyte ("-" - below instrument sensitivity, etc.)
NO3_MG	Laboratory measured dissolved nitrate (mg/L)
MOD_NO3	Modifier for analyte ("-" - below instrument sensitivity, etc.)
NO2_NO3_MG	Lab measured dissolved nitrate + nitritge (mg/L)
MOD_NO2_NO	Modifier for analyte ("-" - below instrument sensitivity, etc.)
K_TOT_MG	Laboratory measured total recoverable potassium (mg/L)
MOD_K_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.)
K_DIS_MG	Laboratory measured dissolved potassium (mg/L)
MOD_K_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.)
SO4_MG	Laboratory measured dissolved sulfate (mg/L)
MOD_SO4	Modifier for analyte ("-" - below instrument sensitivity, etc.)
BI_TOT	Laboratory measured total recoverable bismuth (ug/L)
MOD_BI_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.)
BI_DIS	Laboratory measured dissolved bismuth (ug/L)
MOD_BI_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.)

USFS AML General Relationship Diagram
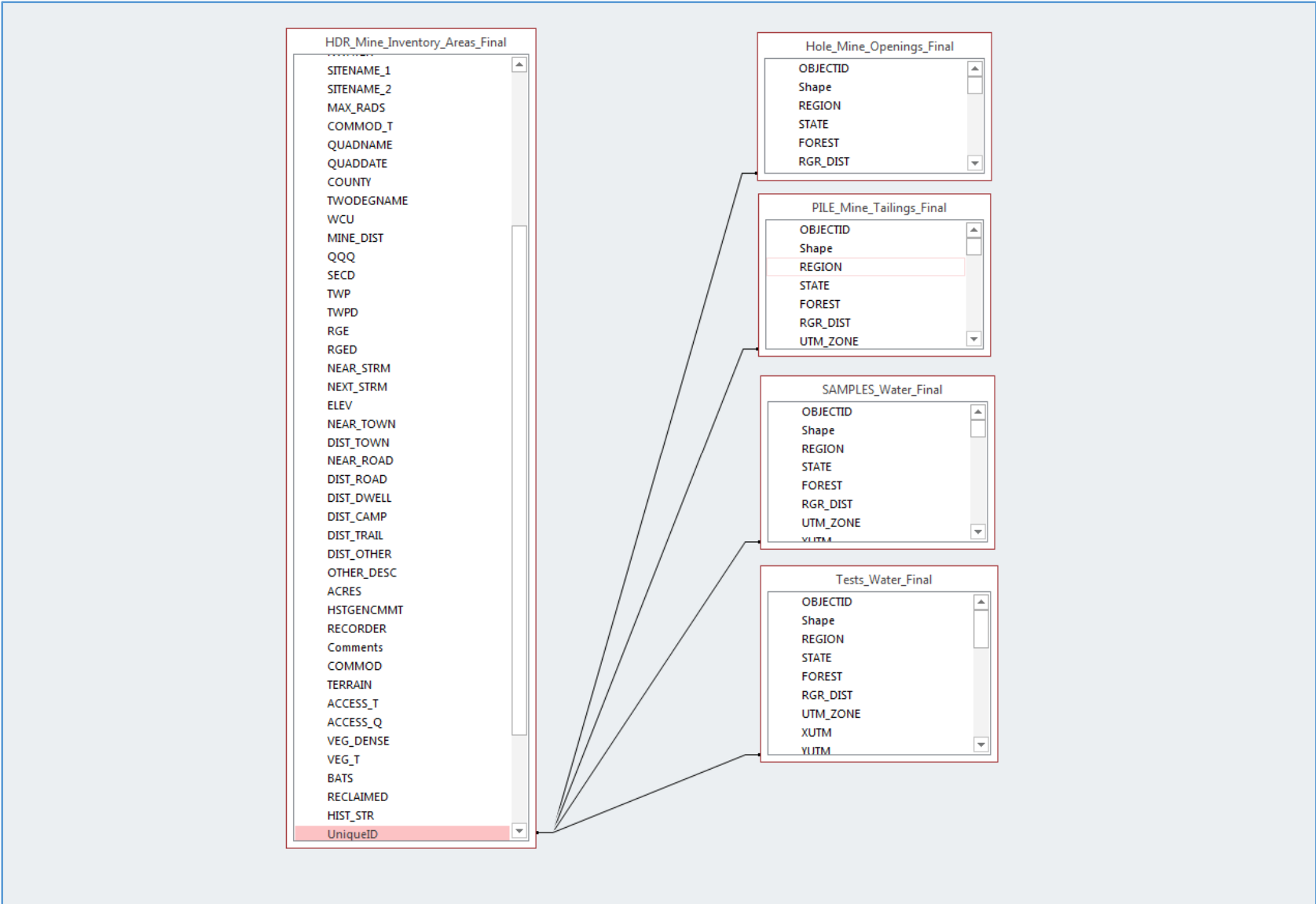
GUIDE FOR USING THE USFS-AMLI FIELD DATA FORM

LOCATION AND IDENTIFICATION

(1) ID# - a numeric code used for location information and for linking all the database files together. It is <u>important</u> for this number to be correct.

> **fst** = two digit code for the specific National Forest
>
> **rd** = two digit code for the specific ranger district
>
> **xutm,yutm** = Universal Transverse Mercator coordinates, shown on the map edge. This defines a 1000 square meter cell. The coordinates are taken from the bottom left-hand corner of the utm cell containing the inventory area (the smallest x,y coordinates defining the cell).
>
> **area#** = number assigned to differentiate between more than one inventory area within a utm cell. Number sequentially from 1, 2, 3, etc.

(2) Site name – Name of the mine or workings from the map or from literature. Cite the literature source if appropriate. If a proper name is unknown, the name of a nearby geographical feature may be used.

(3) Other name/reference – as above if more than one name.

(4) Environmental Degradation – Environmental Degradation Ratings (EDRs) are somewhat subjective. This is necessary, and even desirable, so that the field geologist can take into account site-specific conditions such as geology, effluent discharge volume, placement of the feature in the drainage basin, surface water interactions, precipitation, etc. Numerical pH and conductivity values are useful tools. Natural waters from alpine basins generally have conductivities of less than 100 μS, and streams at lower elevations often have conductivities of 100-300 μS. In areas of intensely altered rock, natural waters can have low pH and high conductivity. In addition, conductivity may be elevated in areas underlain by limestone, gypsum, or other easily soluble rocks. Mine effluent pH and conductivity should be compared to background values when assessing the environmental degradation. Conductivity and pH values, as well as the other criteria listed on the following table are <u>general</u> guidelines, and should not be considered absolutes. Ratings are usually based on combinations of listed characteristics, but occasionally one aspect of a feature may fully justify a rating. (See table 1).
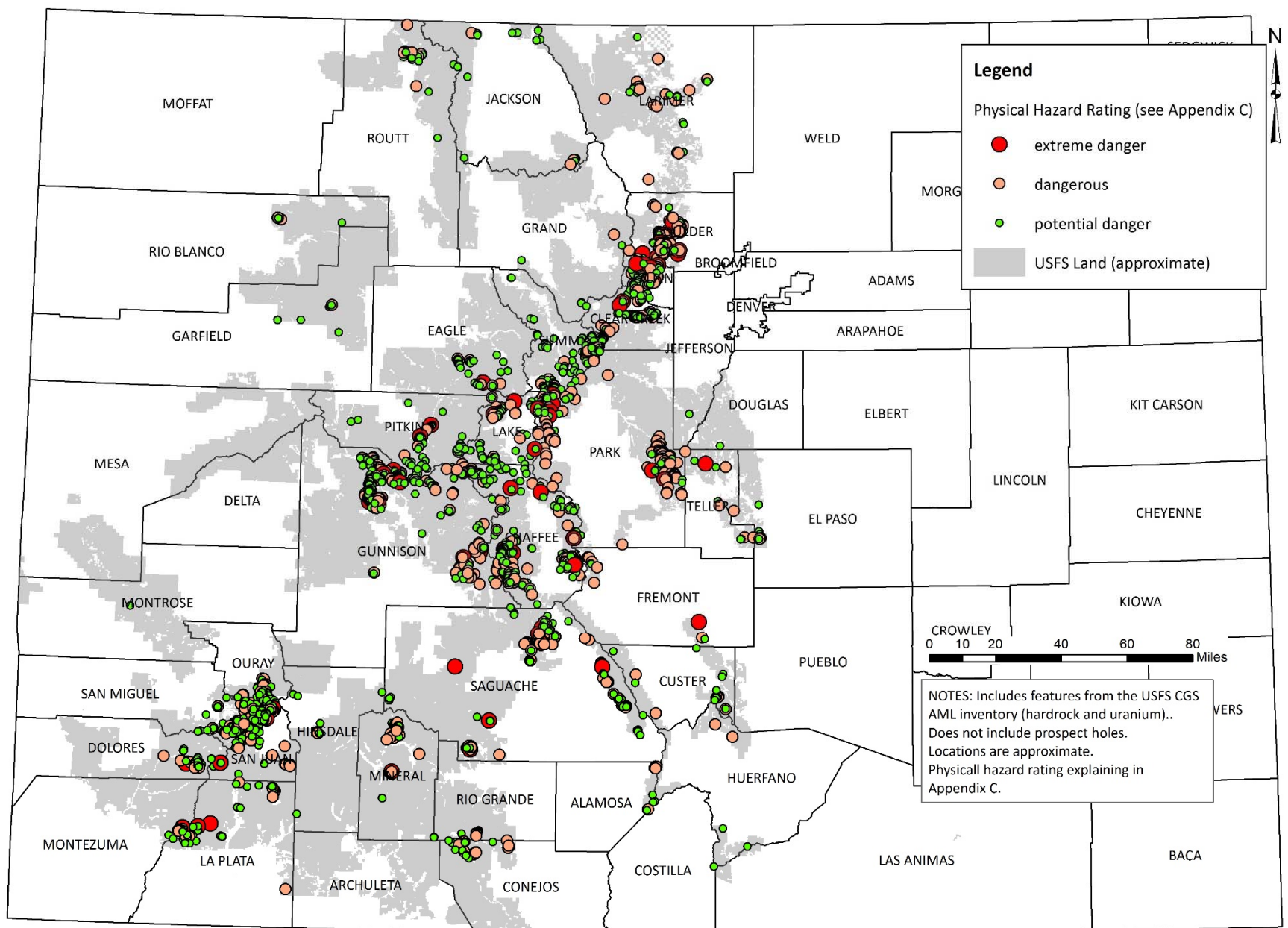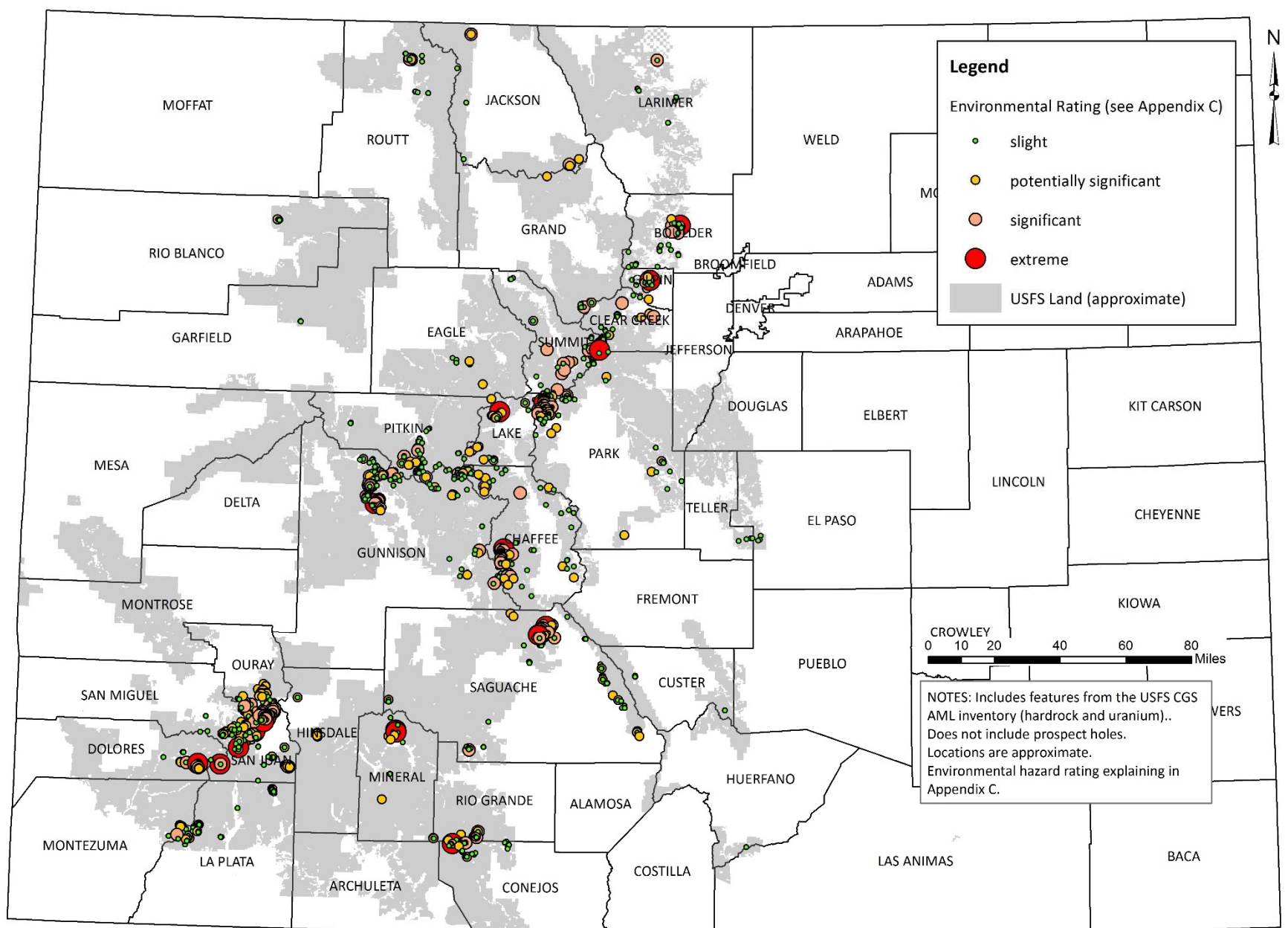
Figure – USFS CGS AML Inventory – Select Environmental and Physical Hazards (hardrock and uranium mine features, no prospects). Top: AML features that had a slight to extreme environmental hazard rating (see the rating descriptions in this appendix). Bottom: AML features that had a extreme to potential danger rating (see the rating descriptions in this appendix). These maps may show locations that are not related to hardrock mines, uranium mines, and may also include additional prospect pits, etc.

Table 1. General guidelines for assigning Environmental Degradation Ratings (EDR).

Rating (EDR)	Feature usually displays one or more of the following characteristics:
1=EXTREME	- Contamination offsite is severe. - Receiving stream is "dead" or sterile at the mine and downstream. - Effluent has extremely low pH (<4). - Effluent has extremely high conductivity (>1500 μS; >1000 μS in alpine areas). - High flows of poor-quality water, relative to the receiving stream. - Abundant precipitate at the mine and in the receiving stream. - Very large dumps or tailings piles with evidence of severe erosion, especially if they have abundant sulfides.
2=SIGNIFICANT	- Receiving stream is significantly or obviously adversely affected, but not "dead" or sterile. - Effluent has low pH (<5). - Effluent has high conductivity (>1000 μS; >500 μS in alpine areas). - Moderate flows of poor-quality water, relative to the receiving stream. - High flows of moderate-quality water, relative to the receiving stream. - Moderate to abundant precipitate at the mine and/or in the receiving stream. - Large sulfide-rich dumps or tailings piles with evidence of moderate erosion. - Large dumps with sparse or no sulfides, but evidence of significant erosion.
3=POTENTIALLY SIGNIFICANT	- Evidence of degraded water quality, but serious effects are not obvious or detected. - Effluent has low pH (<5.5). - Effluent has moderate conductivity (>800 μS; >150 μS in alpine areas). - Poor-quality water with low or no flow (standing water). - Moderate to low flows of moderate-quality water, relative to the receiving stream. - Minor amounts of precipitate. - Very large dumps with little or no evidence of erosion and sparse or no sulfides. - Small and moderate-sized sulfide-rich dumps or tailings piles with evidence of moderate erosion.
4=SLIGHT	- Effluent with slightly acidic pH (<6.5). - Effluent with slightly elevated conductivity (600-800 μS; 100-150 μS in alpine areas). - Low flow volume with sparse or no precipitate. - Small to moderate-sized sulfide-rich dumps or tailings piles with little evidence of erosion.
5=NONE	- No effluent. - Effluent of high quality water. - Small dumps distant from surface water with little or no evidence of erosion.

(5) Mine Hazards – Features are given Physical Hazard Ratings (PHRs) based on definitions shown below.

E = EMERGENCY - This will seldom be noted on the data form since it reflects a "sudden danger or impairment that presents a high probability of substantial physical harm to the health, safety, or general welfare of people before the danger can be abated under normal program operation procedures" [Office of Surface Mining Rules and Regulations, Section 872.5(c)]. An emergency involves a sudden and recent change on which immediate action should be taken.

1 = EXTREME DANGER - This means a "condition that could reasonably be expected to cause substantial physical harm to persons, property....and to which persons or improvements on real property are currently exposed" [OSM Rules and Regulations 872.5(e)]. Sites falling in this category will generally have a high degree of exposure to the chance of injury or damage. A high degree of peril coupled with a high degree of jeopardy being placed on persons or property, either knowingly or unknowingly, is generally involved. Easy access to the general public is a factor. Situations involving open vertical shafts, unstable adits (incompetent rock), very high highwall, or collapsed stopes near roads or towns would fall into this category.

2 = DANGEROUS - The specific mining feature may be as perilous as in a #1 situation, but may be less likely to cause injury or damage because of the remoteness of the site or other constraints on uncontrolled access to the site.

3 = POTENTIALLY DANGEROUS - any open or partially filled adit, moderate height highwall, etc. that is not close to a road or town and would be infrequently accessed by people. This includes situations where the exact hazard is unknown, but could involve a degree of risk at certain times or under certain conditions.

4= (not used during this inventory) - In order to maintain some degree of consistency, this Mine Hazard rating system is based on one used by Colorado Division of Minerals and Geology during an earlier, less detailed inventory. In the earlier inventory, a rating of "4" indicated possible environmental degradation, rather than physical hazard. The "4" rating is not applicable for physical hazards in this inventory.

5 = NO SIGNIFICANT HAZARD - includes collapsed or filled features that are being naturally or intentionally reclaimed, stable mine dumps, and mine sites where all physical hazards have been effectively mitigated.

(7) Quad name and date - write in the name and the last USFS revision or modification date (including "USFS correction guides") listed in the bottom left-hand corner of the PBS quad.

(10) Water Cataloguing Unit # - the number assigned to the drainage basins in Colorado according to the "Hydrologic Unit Map 1974–State of Colorado" published by the USGS.

ENVIRONMENTAL INFORMATION

(28) Vegetation type adjacent to site - use more than one category if appropriate.

(29) Evidence of intentional reclamation - evidence of reclamation includes re-grading, replacing topsoil, seeding, erosion control, fencing, sealing of mine openings.

(30) Size of disturbed area in acres - always give an estimate. Helpful rules of thumb: an acre =

Data Dictionary for USFS Attribute Database Files

Record Name: HDR

The HDR record is the header sheet data record. The header sheet contains the
information recorded by the field geologist on the cover sheet of the field data
form. There is exactly one HDR record for each field form completed. This
information includes the location, topography, vegetation, and other
characteristics of the inventory area. The outer boundary of this area is
recorded in the GIS data files as a closed polygon that contains all the sites
documented on the field data sheet. The numeric identifiers of the inventory
area are shared by all sites that fall within the area.

Field Descriptions

Field Name: AREA
Field Type: Numeric
Field Format: F12.3
Field Description: Area of the polygon representing the outer boundary of the
inventory area. The polygon encloses all sites in the hole, pile, water, and
sample databases that were described on the field data form.
The units are square meters.

Field Name: PERIMETER
Field Type: Numeric
Field Format: F12.3
Field Description: Perimeter of the polygon representing the outer boundary of
the inventory area. The polygon encloses all sites in the hole, pile, water,
and sample databases that were described on the field data form.
The units are meters.

Field Name: HDR_
Field Type: Numeric
Field Format: I10
Field Description: Internal GIS data index used for linking geographic location
records to corresponding attribute data records in Arc/Info. ArcView shape
files assume that attribute records are sorted by this index to match the
correct polygon data record in shape file.

Field Name: HDR_ID
Field Type: Numeric
Field Format: I10
Field Description: Internal GIS data index assigned by Arc/Info during the
digitizing process. This number is only used during compilation of GIS files in
the Arc/Info environment and is not used after that time.

Field Name: REGION
Field Type: Numeric
Field Format: I5
Field Description: USFS Region code, value=2 for all sites in Colorado.

Field Name: STATE
Field Type: Numeric
Field Format: I6
Field Description: USFS State code, value=8 for all sites in Colorado.

Field Name: FOREST
Field Type: Numeric
Field Format: I5
Field Description: USFS Forest code, values are derived from information obtained from the Denver Regional Office. This code is used to uniquely identify the National Forest that the data were collected in. Due to mergers of some forests since the beginning of this project some numbers may have been changed by the US Forest Service. When recent values were not available, unique numbers were assigned by the project data administrator unit current values could be obtained.

Field Name: Rgr_Dist
Field Type: Numeric
Field Format: I5
Field Description: USFS ranger district code, values are derived from information obtained from the Denver Regional Office. This code is used to uniquely identify the ranger district that the data were collected in. Due to mergers of some forests and ranger districts since the beginning of this project some numbers may have been changed by the US Forest Service. When recent values were not available, unique numbers were assigned by the project data administrator until current values could be obtained.

Field Name: UTM_ZONE
Field Type: Numeric
Field Format: I5
Field Description: Universal Transverse Mercator (UTM) Zone in which the feature is located. Value=13. Early in the project this value was included so that areas west of 108 degrees west longitude could be uniquely located. UTM coordinates are not unique but are tied to the zone in which they reside. The western boundary of zone 13, which covers most of Colorado, falls at 108 west longitude. It was later realized that all GIS data could be stored in zone 13 without danger of duplicating values, as a result it was decided to set this value to 13 in recognition of the fact that all GIS files are stored in the UTM Zone 13 map projection.

Field Name: XUTM
Field Type: Numeric
Field Format: I4
Field Description: Unique X coordinate based on the X coordinate of the lower left corner of the 1000 meter UTM grid containing the majority of the inventory area. This value will range from about 138 to 765 depending on the longitude of the site.

Field Name: YUTM
Field Type: Numeric
Field Format: I4
Field Description: Unique Y coordinate based on the Y coordinate of the lower left corner of the 1000 meter UTM grid containing the majority of the inventory area. This value will range from about 4000 to 4550 depending on the latitude of the site.

Field Name: AREAID
Field Type: Numeric
Field Format: I4
Field Description: Unique identifier for densely mined areas where more than one inventory area may occur in the same UTM grid cell mentioned above. Values range from 1 to 3 usually and rarely 4 or more.

Field Name: NHOLE
Field Type: Numeric
Field Format: I6
Field Description: Number of mine features occurring in the inventory area.

Field Name: NPILE
Field Type: Numeric
Field Format: I6
Field Description: Number of mine dumps and similar features occurring in the inventory area.

Field Name: NWATER
Field Type: Numeric
Field Format: I6
Field Description: Number of water tests performed in the inventory area.

Field Name: SITENAME_1
Field Type: Character
Field Format: A60
Field Description: Primary name associated with the inventory area, or sites contained within it. Usually based on literature or map notations. When none were available then geographic names and relative references were used.

Field Name: SITENAME_2
Field Type: Character
Field Format: A60
Field Description: Secondary name associated with the inventory area, or sites contained within it. Usually based on literature or map notations. When none were available then geographic names and relative references were used. References to literature sources may also be included in this field.

Field Name: HPED
Field Type: Numeric
Field Format: A1
Field Description: Highest priority environmental degradation present in the inventory area. Values are 1=extreme; 2=significant; 3=potentially significant; 4=slight; 5=none, 0=unknown (0 was used to rate sites that were documented but not actually visited).

Field Name: HPMH
Field Type: Numeric
Field Format: A1
Field Description: Highest priority mine hazard (also referred to as "physical hazard) present in the inventory area. Values are E=emergency; 1=extreme danger; 2=dangerous; 3=potentially dangerous; 5=no significant hazard, 0=unknown (0 was used to rate sites that were documented but not actually visited). No rating of 4 was used to maintain compatibility with older inventories conducted by the Colorado Division of Minerals and Geology.

Field Name: MAX_RADS
Field Type: Numeric
Field Format: I6
Field Description: Maximum radiation measurement obtained within the inventory area. Consult the hole and pile records for specific information about radiation measurements, units of measure and other relevant information.

Field Name: COMMOD
Field Type: Character
Field Format: A1
Field Description: Code representing the class of commodity mined in the area.
Values are C=coal; U=uranium; M=metals; I=industrial material.

Field Name: COMMOD_T
Field Type: Character
Field Format: A20
Field Description: Type of commodity mined in the area. Values vary depending
upon the region. May include Gold, Silver, Gravel, etc.

Field Name: QUADNAME
Field Type: Character
Field Format: A24
Field Description: Name of USGS 1:24,000 scale base map in which the inventory
area occurs.

Field Name: QUADDATE
Field Type: Numeric
Field Format: I4
Field Description: Date of issue of USGS 1:24,000 scale base map in which the
inventory area occurs.

Field Name: COUNTY
Field Type: Character
Field Format: A20
Field Description: County in which the inventory area occurs.

Field Name: TWODEGNAME
Field Type: Character
Field Format: A24
Field Description: Name of USGS 1:250,000 scale base map in which the inventory
area occurs.

Field Name: WCU
Field Type: Numeric
Field Format: I8
Field Description: Numeric identifier of EPA defined water cataloguing unit in
which the inventory area occurs.

Field Name: MINE_DIST
Field Type: Character
Field Format: A30
Field Description: Mining district or other industry recognized designation for
the area in which the inventory area occurs.

Field Name: QQQ
Field Type: Character
Field Format: A12
Field Description: Aliquot part of the section in which the inventory area
occurs. The order of quarter designation goes from smallest to largest as in "NW
of the Southwest of the Northeast quarter of section 6."

Field Name: SECD
Field Type: Numeric
Field Format: I2

Field Description: Number of the section in which the inventory area occurs.
Values are from 1 to 36.

Field Name: TWP
Field Type: Numeric
Field Format: F5.1
Field Description: Number of the township in which the inventory area occurs.

Field Name: TWPD
Field Type: Character
Field Format: A1
Field Description: Direction of the township in which the inventory area occurs.

Field Name: RGE
Field Type: Numeric
Field Format: F5.1
Field Description: Number of the range in which the inventory area occurs.

Field Name: RGED
Field Type: Character
Field Format: A1
Field Description: Direction of the range in which the inventory area occurs.

Field Name: NEAR_STRM
Field Type: Character
Field Format: A20
Field Description: Name of the stream flowing nearest to the inventory area.

Field Name: NEXT_STRM
Field Type: Character
Field Format: A20
Field Description: Name of the stream into which NEAR_STRM flows.

Field Name: ELEV
Field Type: Numeric
Field Format: I5
Field Description: Approximate elevation of the inventory area.

Field Name: SLOPE
Field Type: Numeric
Field Format: A1
Field Description: Slope of the terrain in the inventory area. Values are 1=0-10°; 2=11-35°; 3=greater than 35°

Field Name: TERRAIN
Field Type: Character
Field Format: A1
Field Description: Type of the terrain in the inventory area. Values are R=rolling or flat; F=foothills; T=mesa; H=hogback; M=mountains; S=steep/narrow canyon

Field Name: ACCESS_T
Field Type: Character
Field Format: A1
Field Description: Type of access to the inventory area. Values are N=no trail; T=trail; J=jeep road; G=gravel road; M=paved road; P=private/restricted road

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Field Name: ACCESS_Q
Field Type: Character
Field Format: A1
Field Description: Quality of access to the inventory area. Values are G=good;
M=moderate; P=poor; X=very poor


Field Name: NEAR_TOWN
Field Type: Character
Field Format: A20
Field Description: Name of nearest town to the inventory area.


Field Name: DIST_TOWN
Field Type: Numeric
Field Format: F4.1
Field Description: Distance to town nearest the inventory area.


Field Name: NEAR_ROAD
Field Type: Character
Field Format: A30
Field Description: Name of nearest road to the inventory area.


Field Name: DIST_ROAD
Field Type: Numeric
Field Format: F4.1
Field Description: Distance to road nearest the inventory area.


Field Name: DIST_DWELL
Field Type: Numeric
Field Format: F4.1
Field Description: Distance to inhabited dwelling nearest the inventory area.


Field Name: DIST_CAMP
Field Type: Numeric
Field Format: F4.1
Field Description: Distance to campground nearest the inventory area.


Field Name: DIST_TRAIL
Field Type: Numeric
Field Format: F4.1
Field Description: Distance to trail nearest the inventory area.


Field Name: DIST_OTHER
Field Type: Numeric
Field Format: F4.1
Field Description: Distance to other feature(s) nearest the inventory area.


Field Name: OTHER_DESC
Field Type: Character
Field Format: A20
Field Description: Description of other feature(s) nearest the inventory area,
such as an unmarked trail, informal campground, cross-country ski hut, etc.
.


Field Name: VEG_DENSE
Field Type: Character
Field Format: A1
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Field Description: Density of vegetation in undisturbed areas adjacent to the inventory area. Values are D=dense; M=moderate; S=sparse; B=barren

Field Name: VEG_T
Field Type: Character
Field Format: A4
Field Description: Type of vegetation in undisturbed areas adjacent to the inventory area. Values are B=barren; W=weeds; G=grass; R=riparian; S=sagebrush/oakbrush/brush; J=juniper/piñon; A=aspen; P=pine/spruce/fir; T=tundra

Field Name: BATS
Field Type: Character
Field Format: A1
Field Description: Evidence of bat activity in/near any mine opening within the inventory area. Only positive evidence is recorded as "Yes". An answer of "No" does <u>not</u> ascertain the absence of bats, only that no positive evidence of bats was found. Values are G=guano; I=insect remains; B=bat sighting; O=other; N=No

Field Name: RECLAIMED
Field Type: Logical
Field Format: L1
Field Description: Has any reclamation been done in the inventory area. Values are –1=True; 0=False

Field Name: ACRES
Field Type: Numeric
Field Format: F5.1
Field Description: Number of acres reclaimed.

Field Name: HIST_STR
Field Type: Logical
Field Format: L1
Field Description: Are there any historical structures in the inventory area. Values are –1=True; 0=False

Field Name: HSTGENCMMT
Field Type: Memo
Field Format: Free-form text
Field Description: Comments about the site in general or the historical structures. This is a dBase memo field that is accessible from dBase or MS-Access. The memo fields cannot be accessed from ArcView. To view the memo fields use the databases in the /database folder of the CD-ROM, not the /shape folder.

Field Name: RECORDER
Field Type: Character
Field Format: A40
Field Description: Name of geologist who completed the inventory form with date of site visit.

Record Name: HOLE

The HOLE record contains the information recorded for each of the mine openings that occur in the field inventory area. There can be zero or more HOLE records for each HDR record in the database. The HOLE record contains the information recorded by the field geologist in the mine opening data section of the field data form. This information includes the dimensions, condition, access deterrents, water drainage and other characteristics of each mine opening in the inventory area.

Field Descriptions

Field Name: AREA
Field Type: Numeric
Field Format: F12.3
Field Description: Not used since point features have no area. Value=0

Field Name: PERIMETER
Field Type: Numeric
Field Format: F12.3
Field Description: Not used since point features have no perimeter. Value=0

Field Name: HOLE_
Field Type: Numeric
Field Format: I10
Field Description: Internal GIS data index used for linking geographic location records to corresponding attribute data records in Arc/Info. ArcView shape files assume that attribute records are sorted by this index to match the correct polygon data record in shape file.

Field Name: HOLE_ID
Field Type: Numeric
Field Format: I10
Field Description: Internal GIS data index assigned by Arc/Info during the digitizing process. This number is only used during compilation of GIS files in the Arc/Info environment and is not used after that time.

Field Name: REGION
Field Type: Numeric
Field Format: I5
Field Description: USFS Region code, value=2 for all sites in Colorado.

Field Name: STATE
Field Type: Numeric
Field Format: I6
Field Description: USFS State code, value=8 for all sites in Colorado.

Field Name: FOREST
Field Type: Numeric
Field Format: I5
Field Description: USFS Forest code, values are derived from information obtained from the Denver Regional Office. This code is used to uniquely identify the National Forest that the data were collected in. Due to mergers of some forests since the beginning of this project some numbers may have been changed by the US Forest Service. When recent values were not available, unique

numbers were assigned by the project data administrator unit current values could be obtained.

Field Name: Rgr_Dist
Field Type: Numeric
Field Format: I5
Field Description: USFS ranger district code, values are derived from information obtained from the Denver Regional Office. This code is used to uniquely identify the ranger district that the data were collected in. Due to mergers of some forests and ranger districts since the beginning of this project some numbers may have been changed by the US Forest Service. When recent values were not available, unique numbers were assigned by the project data administrator unit current values could be obtained.

Field Name: UTM_ZONE
Field Type: Numeric
Field Format: I5
Field Description: Universal Transverse Mercator (UTM) Zone in which the feature is located. Value=13. Early in the project this value was included so that areas west of 108 degrees west longitude could be uniquely located. UTM coordinates are not unique but are tied to the zone in which they reside. The western boundary of zone 13 which covers most of Colorado falls at 108 west longitude. It was later realized that all GIS data could be stored in zone 13 without danger of duplicating values, as a result it was decided to set this value to 13 in recognition of the fact that all GIS files are stored in the UTM Zone 13 map projection.

Field Name: XUTM
Field Type: Numeric
Field Format: I4
Field Description: Unique X coordinate based on the X coordinate of the lower left corner of the 1000 meter UTM grid containing the majority of the inventory area. This value will range from about 138 to 765 depending on the longitude of the site.

Field Name: YUTM
Field Type: Numeric
Field Format: I4
Field Description: Unique Y coordinate based on the Y coordinate of the lower left corner of the 1000 meter UTM grid containing the majority of the inventory area. This value will range from about 4000 to 4550 depending on the latitude of the site.

Field Name: AREAID
Field Type: Numeric
Field Format: I4
Field Description: Unique identifier for densely mined areas where more than one inventory area may occur in the same UTM grid cell mentioned above. Values range from 1 to 3 usually and rarely 4 or more.

Field Name: HID
Field Type: Numeric
Field Format: I4

Field Description: Unique hole id assigned to each mine opening in the inventory area. Values range from 100-199. This serves as a unique index to all holes found in a particular inventory area.

Field Name: HTYPE
Field Type: Character
Field Format: A2
Field Description: Type of mine opening. Values are: A = adit; S = vertical shaft; I = incline shaft; P = prospect hole; ST = stope; G = glory hole; SU = subsidence feature; PT = open pit; O = other (explained in comments).

Field Name: HEIGHT
Field Type: Numeric
Field Format: I5
Field Description: Height of the mine opening in feet.

Field Name: WIDTH
Field Type: Numeric
Field Format: I5
Field Description: Width of the mine opening in feet.

Field Name: DEPTH
Field Type: Numeric
Field Format: I5
Field Description: Actual or estimated depth of the mine opening in feet.

Field Name: DEPTH_MOD
Field Type: Character
Field Format: A1
Field Description: Contains a '+' if the depth cannot be accurately estimated, and a minimum depth value is recorded in the DEPTH field.

Field Name: CONDITION
Field Type: Character
Field Format: A1
Field Description: Condition of the mine opening. Values are I = intact; P = partially collapsed or filled; F = filled or collapsed; N = feature is said to exist but was searched for and not found.

Field Name: DRAINAGE
Field Type: Character
Field Format: A1
Field Description: Description of water draining from the mine opening. Values are N = no water draining; W = water draining; S = standing water only (note at what depth below grade in comments)

Field Name: RADS
Field Type: Numeric
Field Format: I6
Field Description: Radiation counts measured at or near the mine opening. Range of values vary, units are in counts per second.

Field Name: DETER_T
Field Type: Character
Field Format: A2

Field Description: Type of access deterrent installed at mine opening. Values
are N = none; S = sign; F = fence; C = sealed or capped; D = open door or hatch;
L = locked door or hatch; G = open grill; O = other, explain in comments.

Field Name: DETER_C
Field Type: Character
Field Format: A1
Field Description: Condition of access deterrent installed at mine opening.
Values are : P = prevents access; D = discourages access; I = ineffective

Field Name: ENV_RATING
Field Type: Character
Field Format: A1
Field Description: Rating of environmental degradation attributable to mine
opening or activities related to construction/development of mine opening.
Values are : 1 = extreme; 2 = significant; 3 = potentially significant; 4 =
slight; 5 = none

Field Name: HAZ_RATING
Field Type: Character
Field Format: A1
Field Description: Rating of physical hazard posed to human life by mine opening
or activities/structures related to construction/development of mine opening.
Values are E = emergency; 1 = extreme danger; 2 = dangerous; 3 = potential
danger; 5 = no significant hazard. No rating of 4 was used to maintain
compatibility with older inventories conducted by the Colorado Division of
Minerals and Geology.

Field Name: ROLL
Field Type: Character
Field Format: A6
Field Description: Identifier code/name of slide film roll used to photograph
appearance of mine opening.

Field Name: FRAME
Field Type: Character
Field Format: A12
Field Description: Frame number(s) of the slide film roll used to photograph
appearance of mine opening.

Field Name: SAMPLED
Field Type: Logical
Field Format: L1
Field Description: Not used. Originally intended to indicate when additional
water sampling had been performed.

Field Name: COMMENTS
Field Type: Memo
Field Format: Free form text
Field Description: Contains extended comments describing the mine opening and
other information of importance relevant to the site.

Field Name: SAMPLE_IDS
Field Type: Memo
Field Format: Free form text

Field Description: Not used. Originally intended to store additional information and identifiers related to water sampling at the site.

Record Name: PILE

The PILE record contains the information recorded for each of the mine dumps or tailing piles that occur in the field inventory area. There can be zero or more PILE records for each HDR record in the database. The PILE record contains the information recorded by the field geologist in the mine dump data section of the field data form. This information includes the dimensions, condition, access deterrents, water drainage and other characteristics of each mine dump or tailings pile in the inventory area.

Field Descriptions

Field Name: AREA
Field Type: Numeric
Field Format: F12.3
Field Description: Not used since point features have no area. Value=0

Field Name: PERIMETER
Field Type: Numeric
Field Format: F12.3
Field Description: Not used since point features have no perimeter. Value=0

Field Name: PILE_
Field Type: Numeric
Field Format: I10
Field Description: Internal GIS data index used for linking geographic location records to corresponding attribute data records in Arc/Info. ArcView shape files assume that attribute records are sorted by this index to match the correct polygon data record in shape file.

Field Name: PILE_ID
Field Type: Numeric
Field Format: I10
Field Description: Internal GIS data index assigned by Arc/Info during the digitizing process. This number is only used during compilation of GIS files in the Arc/Info environment and is not used after that time.

Field Name: REGION
Field Type: Numeric
Field Format: I5
Field Description: USFS Region code, value=2 for all sites in Colorado.

Field Name: STATE
Field Type: Numeric
Field Format: I6
Field Description: USFS State code, value=8 for all sites in Colorado.

Field Name: FOREST
Field Type: Numeric
Field Format: I5
Field Description: USFS Forest code, values are derived from information obtained from the Denver Regional Office. This code is used to uniquely identify the National Forest that the data were collected in. Due to mergers of some forests since the beginning of this project some numbers may have been changed by the US Forest Service. When recent values were not available, unique numbers were assigned by the project data administrator unit current values could be obtained.

Field Name: Rgr_Dist
Field Type: Numeric
Field Format: I5
Field Description: USFS ranger district code, values are derived from
information obtained from the Denver Regional Office. This code is used to
uniquely identify the ranger district that the data were collected in. Due to
mergers of some forests and ranger districts since the beginning of this project
some numbers may have been changed by the US Forest Service. When recent values
were not available, unique numbers were assigned by the project data
administrator unit current values could be obtained.

Field Name: UTM_ZONE
Field Type: Numeric
Field Format: I5
Field Description: Universal Transverse Mercator (UTM) Zone in which the feature
is located. Value=13. Early in the project this value was included so that
areas west of 108 degrees west longitude could be uniquely located. UTM
coordinates are not unique but are tied to the zone in which they reside. The
western boundary of zone 13, which covers most of Colorado, falls at 108 west
longitude. It was later realized that all GIS data could be stored in zone 13
without danger of duplicating values, as a result it was decided to set this
value to 13 in recognition of the fact that all GIS files are stored in the UTM
Zone 13 map projection.

Field Name: XUTM
Field Type: Numeric
Field Format: I4
Field Description: Unique X coordinate based on the X coordinate of the lower
left corner of the 1000 meter UTM grid containing the majority of the inventory
area. This value will range from about 138 to 765 depending on the longitude of
the site.

Field Name: YUTM
Field Type: Numeric
Field Format: I4
Field Description: Unique Y coordinate based on the Y coordinate of the lower
left corner of the 1000 meter UTM grid containing the majority of the inventory
area. This value will range from about 4000 to 4550 depending on the latitude
of the site.

Field Name: AREAID
Field Type: Numeric
Field Format: I4
Field Description: Unique identifier for densely mined areas where more than one
inventory area may occur in the same UTM grid cell mentioned above. Values range
from 1 to 3 usually and rarely 4 or more.

Field Name: PID
Field Type: Numeric
Field Format: I4
Field Description: Unique pile id assigned to each mine waste or tailings pile
in the inventory area. Values range from 200-299. This serves as a unique
index to all dumps found in a particular inventory area.

Field Name: PTYPE
Field Type: Character

Field Format: A2
Field Description: Type of mine dump. Values are D = mine dump; T = mill
tailings; W = coal waste bank; S = overburden or development spoil pile; DS =
dredge spoil; HD = placer or hydraulic deposit; H = highwall; P = processing
site

Field Name: LENGTH
Field Type: Numeric
Field Format: I5
Field Description: Length of the long dimension of the mine dump (in feet).

Field Name: WIDTH
Field Type: Numeric
Field Format: I5
Field Description: Width of the shorter dimension of the mine dump (in feet).
   16 N

Field Name: VOLUME
Field Type: Numeric
Field Format: I6
Field Description: Estimated volume of the mine dump material (in cubic yards).

Field Name: SLOPE_ANG
Field Type: Numeric
Field Format: I2
Field Description: Steepest slope angle of the mine dump materials (in degrees
from horizontal).

Field Name: SLOPE_LNTH
Field Type: Numeric
Field Format: I4
Field Description: Length of the steepest slope area of mine dump (in feet).

Field Name: MAT_SIZE
Field Type: Character
Field Format: A4
Field Description: Grain size(s) of material in mine dump. Values are F = fine;
S = sand; G = gravel; L = cobbles; B = boulders

Field Name: CEMENT
Field Type: Character
Field Format: A1
Field Description: Degree of overall cementation of mine dump materials. Values
are : W = well cemented; M = moderately cemented; U = uncemented

Field Name: VEG
Field Type: Character
Field Format: I4
Field Description: Types of vegetation occurring on or around the mine dump.
Values are G = mixed grass; S = sagebrush/oakbrush/brush; J = juniper/piñon; A =
aspen; P = pine/spruce/fir; T = tundra; R = riparian; F = tilled crops; B =
barren/no vegetation; W = weeds

Field Name: VEG_D
Field Type: Character
Field Format: A3

Field Description: Density of vegetation occurring on or around the mine dump.
Values are: D = dense; M = moderate; S = sparse; B = barren

Field Name: DRAINAGE
Field Type: Character
Field Format: A4
Field Description: Type of water drainage occurring on or around the mine dump.
Values are N = no water draining; W = water draining across surface; S =
standing water only; SP = water seeping from side of feature

Field Name: STABILITY
Field Type: Character
Field Format: A1
Field Description: Estimated stability of the overall mine dump feature. Values
are U = unstable; P = potentially unstable; S = stable

Field Name: NORML_EROD
Field Type: Character
Field Format: A3
Field Description: Description of types of erosion affecting the dump site
during periods of normal precipitation. Values are N = none; R = rills; G =
gullies; S = sheet wash

Field Name: STORM_EROD
Field Type: Character
Field Format: A1
Field Description: Description of erosional susceptibility of the dump site
during storm events. Values are C = in contact with normal stream; S = near
stream or gully, but only eroded during storm or flood; N = no storm/flood
runoff erosion

Field Name: WIND_EROD
Field Type: Character
Field Format: A1
Field Description: Description of susceptibility of mine dump to wind erosion.
Values are N = none; D = dunes; B = blowouts; A = airborne dust

Field Name: RADS
Field Type: Numeric
Field Format: I6
Field Description: Radiation counts measured at or near the mine dump. Range of
values vary, units are in counts per second unless otherwise indicated in the
RAD_UNITS field.

Field Name: RAD_UNITS
Field Type: Character
Field Format: A5
Field Description: Units of the radiation measurements shown in RADS. Values
are Blank=Counts per second, CPS=counts per second, CPM=counts per minute,
MR/10=millirems per hour divided by ten (the value in the RADS field is actually
one tenth of the value displayed), TBG=times background.

Field Name: DETER_T
Field Type: Character
Field Format: A2

Field Description: Type of access deterrent installed at mine dump. Values are N = none; S = sign; F = fence; C = sealed or capped; D = open door or hatch; L = locked door or hatch; G = open grill; O = other, explain in comments.

Field Name: DETER_C
Field Type: Character
Field Format: A1
Field Description: Condition of access deterrent installed at mine dump. Values are : P = prevents access; D = discourages access; I = ineffective

Field Name: ENV_RATING
Field Type: Character
Field Format: A1
Field Description: Rating of environmental degradation attributable to mine dump or activities related to construction/development of mine opening. Values are: 1 = extreme; 2 = significant; 3 = potentially significant; 4 = slight; 5 = none

Field Name: HAZ_RATING
Field Type: Character
Field Format: A1
Field Description: Rating of physical hazard posed to human life by mine opening or activities/structures related to construction/development of mine dump. Values are E = emergency; 1 = extreme danger; 2 = dangerous; 3 = potential danger; 5 = no significant hazard. No rating of 4 was used to maintain compatibility with older inventories conducted by the Colorado Division of Minerals and Geology.

Field Name: ROLL
Field Type: Character
Field Format: A6
Field Description: Identifier code/name of slide film roll used to photograph appearance of mine dump.

Field Name: FRAME
Field Type: Character
Field Format: A12
Field Description: Frame number(s) of the slide film roll used to photograph appearance of mine dump.

Field Name: SAMPLED
Field Type: Logical
Field Format: L1
Field Description: Not used. Originally intended to indicate when additional water sampling had been performed.

Field Name: COMMENTS
Field Type: Memo
Field Format: Free form text
Field Description: Contains extended comments describing the mine dump and other information of importance relevant to the site.

Field Name: SAMPLE_IDS
Field Type: Memo
Field Format: Free form text
Field Description: Not used. Originally intended to store additional information and identifiers related to water sampling at the site.

Record Name: WATER

The WATER record contains the information recorded for each of the water
tests/samples conducted in the field within the inventory area. There can be
zero or more WATER records for each HDR record in the database. The WATER record
contains the information recorded by the field geologist in the water
test/sample data section of the field data form. This information includes the
pH, conductivity, discharge rate, biological effects of water contamination and
other characteristics of each water test conducted in the inventory area.

Field Descriptions

Field Name: AREA
Field Type: Numeric
Field Format: F12.3
Field Description: Not used since point features have no area. Value=0

Field Name: PERIMETER
Field Type: Numeric
Field Format: F12.3
Field Description: Not used since point features have no perimeter. Value=0

Field Name: WATER_
Field Type: Numeric
Field Format: I10
Field Description: Internal GIS data index used for linking geographic location
records to corresponding attribute data records in Arc/Info. ArcView shape
files assume that attribute records are sorted by this index to match the
correct polygon data record in shape file.

Field Name: WATER_ID
Field Type: Numeric
Field Format: I10
Field Description: Internal GIS data index assigned by Arc/Info during the
digitizing process. This number is only used during compilation of GIS files in
the Arc/Info environment and is not used after that time.

Field Name: REGION
Field Type: Numeric
Field Format: I5
Field Description: USFS Region code, value=2 for all sites in Colorado.

Field Name: STATE
Field Type: Numeric
Field Format: I6
Field Description: USFS State code, value=8 for all sites in Colorado.

Field Name: FOREST
Field Type: Numeric
Field Format: I5
Field Description: USFS Forest code, values are derived from information
obtained from the Denver Regional Office. This code is used to uniquely
identify the National Forest that the data was collected in. Due to mergers of
some forests since the beginning of this project some numbers may have been
changed by the US Forest Service. When recent values were not available, unique
numbers were assigned by the project data administrator unit current values
could be obtained.

Field Name: Rgr_Dist
Field Type: Numeric
Field Format: I5
Field Description: USFS ranger district code, values are derived from information obtained from the Denver Regional Office. This code is used to uniquely identify the ranger district that the data were collected in. Due to mergers of some forests and ranger districts since the beginning of this project some numbers may have been changed by the US Forest Service. When recent values were not available, unique numbers were assigned by the project data administrator unit current values could be obtained.

Field Name: UTM_ZONE
Field Type: Numeric
Field Format: I5
Field Description: Universal Transverse Mercator (UTM) Zone in which the feature is located. Value=13. Early in the project this value was included so that areas west of 108 degrees west longitude could be uniquely located. UTM coordinates are not unique but are tied to the zone in which they reside. The western boundary of zone 13, which covers most of Colorado, falls at 108 west longitude. It was later realized that all GIS data could be stored in zone 13 without danger of duplicating values, as a result it was decided to set this value to 13 in recognition of the fact that all GIS files are stored in the UTM Zone 13 map projection.

Field Name: XUTM
Field Type: Numeric
Field Format: I4
Field Description: Unique X coordinate based on the X coordinate of the lower left corner of the 1000 meter UTM grid containing the majority of the inventory area. This value will range from about 138 to 765 depending on the longitude of the site.

Field Name: YUTM
Field Type: Numeric
Field Format: I4
Field Description: Unique Y coordinate based on the Y coordinate of the lower left corner of the 1000 meter UTM grid containing the majority of the inventory area. This value will range from about 4000 to 4550 depending on the latitude of the site.

Field Name: AREAID
Field Type: Numeric
Field Format: I4
Field Description: Unique identifier for densely mined areas where more than one inventory area may occur in the same UTM grid cell mentioned above. Values range from 1 to 3 usually and rarely 4 or more.

Field Name: WID
Field Type: Numeric
Field Format: I4
Field Description: Unique water id assigned to each water test/sample taken in the inventory area. Values range from 300-399. This serves as a unique index to all water samples in a particular inventory area.

Field Name: FID
Field Type: Numeric

Field Format: I3
Field Description: Feature id of the mine opening or dump where the water sample
was taken. In many cases this id can be used as a link from the water sample
record to the hole or pile record describing the feature sampled. In some cases
there is no FID assigned if the water test was taken independent of any mine
feature. Values are either 100-199 or 200-299.

Field Name: PH
Field Type: Numeric
Field Format: F5.2
Field Description: pH value of the water measured in the field in standard
units. Values are in the pH measurement range of 0 to 14 with <7 being acidic,
and >7 being alkaline.

Field Name: CONDUCT
Field Type: Numeric
Field Format: I6
Field Description: Specific conductance of the water measured in the field in
microSiemens per centimeter. Values may be zero and greater, but values greater
than 2500 are rare.

Field Name: CFS
Field Type: Numeric
Field Format: F8.2
Field Description: Water discharge in gallons per minute. Inestimable seeps are
recorded as 0.1 gpm (The field name "CFS" may be confusing, as this acronym is
commonly used for the discharge measurement unit, cubic feet per second. After
the database was constructed, the standard unit of measurement for field
geologists was changed to gallons per minute. All values in the "CFS" field are
recorded in gallons per minute.)

Field Name: CFS_METHOD
Field Type: Character
Field Format: A1
Field Description: Method of measuring water discharge. Values are E=estimate;
T=bobber/stopwatch/x-section; W=weir; D=catchment; F=flow meter; L=flume

Field Name: CFS_DATE
Field Type: Date
Field Format: D8
Field Description: Date water discharge was measured, in the format mm/dd/yy

Field Name: SAMPLE_LOC
Field Type: Character
Field Format: A2
Field Description: Indicates location where water data was obtained in relation
to the mine feature. Values are A=immediately adjacent to adit/shaft; B=below
dump/tailings; C=immediately above confluence with receiving stream; SW=standing
water in/on feature; RU=receiving stream upstream of feature; RD=receiving stream
downstream of feature;

Field Name: TSD
Field Type: Character
Field Format: A3
Field Description: Evidence of toxicity in site drainage. Values are N = none; A
= absence of benthic organisms; W = opaque water; P = yellow or red precipitate;
S = suspended solids; D = salt deposits

Field Name: ETRS
Field Type: Character
Field Format: A3
Field Description: Evidence of toxicity in the closest receiving stream to the mine feature. Values are N = none; A = absence of benthic organisms; W = opaque water; P = yellow or red precipitate; S = suspended solids; D = salt deposits

Field Name: DIST_STR
Field Type: Numeric
Field Format: I4
Field Description: The distance from the water test and/or sample location to the receiving stream, measured in feet.

Field Name: SAMPLED
Field Type: Logical
Field Format: L1
Field Description: Not used. Originally intended to indicate when additional water sampling had been performed. Data for water samples taken for laboratory analysis are found in the SAMPLE record.

Field Name: COMMENTS
Field Type: Memo
Field Format: Free form text
Field Description: Contains extended comments describing the water test and other information of importance relevant to the testing event.

Field Name: SAMPLE_IDS
Field Type: Memo
Field Format: Free form text
Field Description: Not used. Originally intended to store additional information and identifiers related to water sampling at the site.

Record Name: SAMPLE
The SAMPLE record contains information about all water samples taken for
laboratory analysis during the USFS Abandoned Mine Land Inventory in Colorado.
There can be zero or more SAMPLE records for each HDR record in the database.
Field measurements and laboratory analysis results are included. Field
measurements (pH, conductivity, discharge rate, discharge method, discharge
date) for these water samples are duplicated in the WATER record with the same
ID#.

Field Name: FOO_ID_
Field Type: Numeric
Field Format: I16
Field Description: Internal GIS data index assigned by Arc/Info during the
digitizing process. This number is only used during compilation of GIS files in
the Arc/Info environment and is not used after that time.

Field Name: REGION
Field Type: Numeric
Field Format: I5
Field Description: USFS Region code, value=2 for all sites in Colorado.

Field Name: STATE
Field Type: Numeric
Field Format: I6
Field Description: USFS State code, value=8 for all sites in Colorado.

Field Name: FOREST
Field Type: Numeric
Field Format: I5
Field Description: USFS Forest code, values are derived from information
obtained from the Denver Regional Office. This code is used to uniquely
identify the National Forest that the data were collected in. Due to mergers of
some forests since the beginning of this project some numbers may have been
changed by the US Forest Service. When recent values were not available, unique
numbers were assigned by the project data administrator unit current values
could be obtained.

Field Name: Rgr_Dist
Field Type: Numeric
Field Format: I5
Field Description: USFS ranger district code, values are derived from
information obtained from the Denver Regional Office. This code is used to
uniquely identify the ranger district that the data were collected in. Due to
mergers of some forests and ranger districts since the beginning of this project
some numbers may have been changed by the US Forest Service. When recent values
were not available, unique numbers were assigned by the project data
administrator unit current values could be obtained.

Field Name: RANGER_DIS
Field Type: Character
Field Format: A254
Field Description: Eight character ranger district name used for file processing
and indexing purposes by CGS staff during database compilation.

Field Name: UTM_ZONE

Field Type: Numeric
Field Format: F16.6
Field Description: Universal Transverse Mercator (UTM) Zone in which the feature
is located. Value=13. Early in the project this value was included so that
areas west of 108 degrees west longitude could be uniquely located. UTM
coordinates are not unique but are tied to the zone in which they reside. The
western boundary of zone 13, which covers most of Colorado, falls at 108 west
longitude. It was later realized that all GIS data could be stored in zone 13
without danger of duplicating values, as a result it was decided to set this
value to 13 in recognition of the fact that all GIS files are stored in the UTM
Zone 13 map projection.

Field Name: XUTM
Field Type: Numeric
Field Format: F16.6
Field Description: Unique X coordinate based on the X coordinate of the lower
left corner of the 1000 meter UTM grid containing the majority of the inventory
area. This value will range from about 138 to 765 depending on the longitude of
the site.

Field Name: YUTM
Field Type: Numeric
Field Format: F16.6
Field Description: Unique Y coordinate based on the Y coordinate of the lower
left corner of the 1000 meter UTM grid containing the majority of the inventory
area. This value will range from about 4000 to 4550 depending on the latitude
of the site.

Field Name: AREA
Field Type: Numeric
Field Format: F16.6
Field Description: Unique identifier for densely mined areas where more than one
inventory area may occur in the same UTM grid cell mentioned above. Values range
from 1 to 3 usually and rarely 4 or more.

Field Name: FID
Field Type: Numeric
Field Format: F16.6
Field Description: Unique water id assigned to each water test/sample taken in
the inventory area or feature id of the mine opening or dump where the water
sample was taken. Values range from 100-399. When concatenated with XUTM,
YUTM, and AREA fields, this serves as a unique index within the SAMPLE record.
The concatenated fields can be used as a link to the WATER HOLE or PILE record
the sample is associated with.

Field Name: SAMPLE_COD
Field Type: Character
Field Format: A51
Field Description:

Field Name: BASIN
Field Type: Character
Field Format: A254
Field Description: Drainage basin of sample location. This field has only been
completed for the Columbine Ranger District.

Field Name: SITE_DESCR

Field Type: Character
Field Format: A254
Field Description: Text description of the sample site. These descriptions are
sometimes the same as the inventory area name (SITENAME_1 field), but may
differ.

Field Name: SITE_CODE
Field Type: Character
Field Format: A254
Field Description: A concatenated version of the FST, RD, XUTM, YUTM, AREA, and
FID fields. The site code is unique for each water sample.

Field Name: SITE_ALIAS
Field Type: Character
Field Format: A254
Field Description: A secondary or alternative description of the sample site.

Field Name: SAMPLED_DA
Field Type: Character
Field Format: A27
Field Description: Date water sample was taken (mm/dd/yyyy).

Field Name: LAB_RECEIV
Field Type: Character
Field Format: A27
Field Description: Date the laboratory received the water sample (mm/dd/yyyy).

Field Name: TIME_24HR
Field Type: Character
Field Format: A27
Field Description: Time of day water sample was taken in military time (##:##).

Field Name: AGENCY
Field Type: Character
Field Format: A254
Field Description: Entity for which sampling was performed. Values are
blank=United States Forest Service or USFS=United States Forest Service. This
does not indicate the entity performing the sampling.

Field Name: COMMENT
Field Type: Character
Field Format: A254
Field Description: Comments that may include a description of the physical
sample location, type of sample, and any factors that may affect the analysis
results.

Field Name: TYPE
Field Type: Character
Field Format: A51
Field Description: Describes the type of water source from which the water
sample was taken. Values are adit, shaft, portal, leachate, dump seep, natural
spring, stream, lake, or other. Values of "other" are described in comments.

Field Name: LABORATORY
Field Type: Character
Field Format: A51

Field Description: Values are CDPHE/ICL or CDPHE=Colorado Department of Public Health and Environment-Inorganic Chemistry Laboratory, SLV Analytical=San Luis Valley Analytical Laboratory Inc., USGSBGC=U.S. Geological Survey-Branch of Geochemistry, VISTA=Vista Laboratory Inc.

Field Name: SAMPLER
Field Type: Character
Field Format: A254
Field Description: Entity performing the sampling. Values are blank=Colorado Geological Survey, CDH=Colorado Department of Public Health and Environment, CGS =Colorado Geological Survey, SLV Analytical=San Luis Valley Analytical Laboratory Inc., USGSBGC=U.S. Geological Survey-Branch of Geochemistry, USGSWRD=U.S. Geological Survey-Water Resources Division. When more than one entity was involved in sampling, the field contains both values separated by a forward slash between them.

Field Name: LAT_DD
Field Type: Numeric
Field Format: F16.6
Field Description: Latitude north in decimal degrees.

Field Name: LONG_DD
Field Type: Numeric
Field Format: F16.6
Field Description: Longitude west in decimal degrees.

Field Name: ELEV_FT
Field Type: Numeric
Field Format: F16.6
Field Description: Approximate elevation of sample location in feet.

Field Name: FLOW_CFS
Field Type: Numeric
Field Format: F16.6
Field Description: Water discharge at sample location in cubic feet per second. Values are greater than zero. Occurrences may be estimated or measured as indicated in the OD_Q_GPM field.

Field Name: EST_Q_GPM
Field Type: Numeric
Field Format: F16.6
Field Description: Water discharge at sample location measured in gallons per minute. Values are greater than zero. Occurrences may be estimated or measured as indicated in the OD_Q_GPM field.

Field Name: OD_Q_GPM
Field Type: Character
Field Format: A11
Field Description: A modifier for water discharge given in the FLOW_CFS field or EST_Q_GPM field. Values are blank=not applicable or no data, e(or E)=estimated, m(or M)=measured, -= less than indicated value, +=greater than indicated value.

Field Name: STANDING_W
Field Type: Numeric
Field Format: I6
Field Description: Indicates whether water tested was standing water. Values are −1=sample from standing water, 0=sample not from standing water.

Field Name: STREAM_DES
Field Type: Character
Field Format: A254
Field Description: Description of the streambed at the sample location.

Field Name: WATER_DESC
Field Type: Character
Field Format: A254
Field Description: Description of the water at the sample location

Field Name: FIELD_PH
Field Type: Numeric
Field Format: F16.6
Field Description: pH measured in the field in standard units. Values are in the pH measurement range of 0 to 14 with <7 being acidic, and >7 being alkaline.

Field Name: LAB_PH
Field Type: Numeric
Field Format: F16.6
Field Description: pH measured in the laboratory in standard units. Values are in the pH measurement range of 0 to 14 with <7 being acidic, and >7 being alkaline.

Field Name: TEMP_C
Field Type: Numeric
Field Format: F16.6
Field Description: Temperature of the water sample measured in the field in degrees Celsius.

Field Name: FIELD_COND
Field Type: Numeric
Field Format: F16.6
Field Description: Specific conductance of the water sample measured in the field in microSiemens per centimeter. Values may be zero and greater, but values greater than 2500 are rare.

Field Name: MOD_COND
Field Type: Character
Field Format: A11
Field Description: A modifier for the field specific conductance measurement (FIELD_COND field). The only valid modifier is -=below instrument sensitivity.

Field Name: LAB_COND
Field Type: Numeric
Field Format: F16.6
Field Description: Specific conductance of the water sample measured in the laboratory in microSiemens per centimeter. Values may be zero and greater, but values greater than 2500 are rare.

Field Name: DIS_OXY_MG
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved oxygen measured in the field in milligrams per liter.

Field Name: MOD_DIS_OX

Field Type: Character
Field Format: A11
Field Description: A modifier for the dissolved oxygen measurement (DIS_OXY_MG field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: HARD_MG
Field Type: Numeric
Field Format: F16.6
Field Description: Hardness measured in the lab in milligrams per liter calcium carbonate equivalent.

Field Name: MOD_HARD
Field Type: Character
Field Format: A3
Field Description: A modifier for the hardness measurement (HARD_MG field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: FIELD_ALK_
Field Type: Numeric
Field Format: F16.6
Field Description: Alkalinity measured in the field in milligrams per liter.

Field Name: FIELD_MOD_
Field Type: Character
Field Format: A3
Field Description: A modifier for the field alkalinity measurement (FIELD_ALK_ field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: LAB_ALK_MG
Field Type: Numeric
Field Format: F16.6
Field Description: Alkalinity measured in the lab in milligrams per liter.

Field Name: LAB_MOD_AL
Field Type: Character
Field Format: A3
Field Description: A modifier for the lab alkalinity measurement (LAB_ALK_MG field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: ACIDITY
Field Type: Numeric
Field Format: F16.6
Field Description: Acidity measured in the lab in milligrams per liter.

All the following constituents are measured in the laboratory. Analyses for dissolved constituents were from samples filtered through a 0.45-micron filter:

Field Name: CA_TOT_MG
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable calcium in milligrams per liter.

Field Name: MOD_CA_TOT
Field Type: Character

Field Format: A3
Field Description: A modifier for the total recoverable calcium measurement
(CA_TOT_MG field). Values are -=below instrument sensitivity, +=above instrument
sensitivity.

Field Name: CA_DIS_MG
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved calcium in milligrams per liter.

Field Name: MOD_CA_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved calcium measurement (CA_TOT_MG
field). Values are -=below instrument sensitivity, +=above instrument
sensitivity.

Field Name: MG_TOT_MG
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable magnesium in milligrams per liter.

Field Name: MOD_MG_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable magnesium measurement
(MG_TOT_MG field). Values are -=below instrument sensitivity, +=above instrument
sensitivity.

Field Name: MG_DIS_MG
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved magnesium in milligrams per liter.

Field Name: MOD_MG_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for dissolved magnesium the measurement (MG_DIS_MG
field). Values are -=below instrument sensitivity, +=above instrument
sensitivity.

Field Name: AL_TOT
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable aluminum in micrograms per liter.

Field Name: MOD_AL_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable aluminum measurement
(AL_TOT field). Values are -=below instrument sensitivity, +=above instrument
sensitivity.

Field Name: AL_DIS
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved aluminum in micrograms per liter.

Field Name: MOD_AL_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved aluminum measurement (AL_DIS field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: AG_TOT
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable silver in micrograms per liter

Field Name: MOD_AG_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable silver measurement (AG_TOT field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: AG_DIS
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved silver in micrograms per liter.

Field Name: MOD_AG_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved silver measurement (AG_DIS field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: AS_TOT
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable arsenic in micrograms per liter

Field Name: MOD_AS_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable arsenic measurement (AS_TOT field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: AS_DIS
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved arsenic in micrograms per liter.

Field Name: MOD_AS_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved arsenic measurement (AS_DIS field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: AU_DIS

Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved gold in micrograms per liter.

Field Name: MOD_AU_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved gold measurement (AU_DIS field).
Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: B_TOT
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable boron in micrograms per liter

Field Name: MOD_B_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable boron measurement (B_TOT
field). Values are -=below instrument sensitivity, +=above instrument
sensitivity.

Field Name: B_DIS
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved boron in micrograms per liter.

Field Name: MOD_B_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved boron measurement (B_DIS field).
Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: BR
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved bromine in milligrams per liter.

Field Name: MOD_BR
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved bromine measurement (BR field).
Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: SB_TOT
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable antimony in micrograms per liter

Field Name: MOD_SB_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable antimony measurement
(SB_TOT field). Values are -=below instrument sensitivity, +=above instrument
sensitivity.

Field Name: SB_DIS

Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved antimony in micrograms per liter.

Field Name: MOD_SB_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved antimony measurement (SB_DIS field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: BA_TOT
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable barium in micrograms per liter

Field Name: MOD_BA_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable barium measurement (BA_TOT field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: BA_DIS
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved barium in micrograms per liter.

Field Name: MOD_BA_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved barium measurement (BA_DIS field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: BE_TOT
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable beryllium in micrograms per liter

Field Name: MOD_BE_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable beryllium measurement (BE_TOT field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: BE_DIS
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved beryllium in micrograms per liter.

Field Name: MOD_BE_DIS
Field Type: Character
Field Format: A3

Field Description: A modifier for the dissolved beryllium measurement (BE_DIS field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: CO_TOT
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable cobalt in micrograms per liter

Field Name: MOD_CO_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable cobalt measurement (CO_TOT field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: CO_DIS
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved cobalt in micrograms per liter.

Field Name: MOD_CO_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved cobalt measurement (CO_DIS field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: CD_TOT
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable cadmium in micrograms per liter

Field Name: MOD_CD_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable cadmium measurement (CD_TOT field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: CD_DIS
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved cadmium in micrograms per liter.

Field Name: MOD_CD_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved cadmium measurement (CD_DIS field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: CU_TOT
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable copper in micrograms per liter

Field Name: MOD_CU_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable copper measurement (CU_TOT field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: CU_DIS
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved copper in micrograms per liter.

Field Name: MOD_CU_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved copper measurement (CU_DIS field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: CR_TOT
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable chromium in micrograms per liter

Field Name: MOD_CR_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable chromium measurement (CR_TOT field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: CR_DIS
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved chromium in micrograms per liter.

Field Name: MOD_CR_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved chromium measurement (CR_DIS field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: CN_TOT_MG
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable cyanide in milligrams per liter

Field Name: MOD_CN_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable cyanide measurement (CN_TOT_MG field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: FE_TOT
Field Type: Numeric

Field Format: F16.6
Field Description: Total recoverable iron in micrograms per liter

Field Name: MOD_FE_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable iron measurement (FE_TOT field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: FE_DIS
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved iron in micrograms per liter.

Field Name: MOD_FE_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved iron measurement (FE_DIS field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: GA_TOT
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable gallium in micrograms per liter

Field Name: MOD_GA_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable gallium measurement (GA_TOT field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: GA_DIS
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved gallium in micrograms per liter.

Field Name: MOD_GA_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved gallium measurement (GA_DIS field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: GE_TOT
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable germanium in micrograms per liter

Field Name: MOD_GE_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable germanium measurement (GE_TOT field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: GE_DIS
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved germanium in micrograms per liter.

Field Name: MOD_GE_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved germanium measurement (GE_DIS field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: HG_TOT
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable mercury in micrograms per liter

Field Name: MOD_HG_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable mercury measurement (HG_TOT field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: HG_DIS
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved mercury in micrograms per liter.

Field Name: MOD_HG_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved mercury measurement (HG_DIS field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: LI_TOT
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable lithium in micrograms per liter

Field Name: MOD_LI_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable lithium measurement (LI_TOT field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: LI_DIS
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved lithium in micrograms per liter.

Field Name: MOD_LI_DIS
Field Type: Character
Field Format: A3

Field Description: A modifier for the dissolved lithium measurement (LI_DIS field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: MO_TOT
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable molybdenum in micrograms per liter

Field Name: MOD_MO_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable molybdenum measurement (MO_TOT field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: MO_DIS
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved molybdenum in micrograms per liter.

Field Name: MOD_MO_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved molybdenum measurement (MO_DIS field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: MN_TOT
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable manganese in micrograms per liter

Field Name: MOD_MN_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable manganese measurement (MN_TOT field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: MN_DIS
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved manganese in micrograms per liter.

Field Name: MOD_MN_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved manganese measurement (MN_DIS field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: NI_TOT
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable nickel in micrograms per liter

Field Name: MOD_NI_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable nickel measurement (NI_TOT field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: NI_DIS
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved nickel in micrograms per liter.

Field Name: MOD_NI_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved nickel measurement (NI_DIS field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: PB_TOT
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable lead in micrograms per liter

Field Name: MOD_PB_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable lead measurement (PB_TOT field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: PB_DIS
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved lead in micrograms per liter.

Field Name: MOD_PB_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved lead measurement (PB_DIS field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: SE_TOT
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable selenium in micrograms per liter

Field Name: MOD_SE_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable selenium measurement (SE_TOT field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: SE_DIS
Field Type: Numeric
Field Format: F16.6

Field Description: Dissolved selenium in micrograms per liter.

Field Name: MOD_SE_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved selenium measurement (SE_DIS field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: SN_TOT
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable tin in micrograms per liter

Field Name: MOD_SN_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable tin measurement (SN_TOT field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: SN_DIS
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved tin in micrograms per liter.

Field Name: MOD_SN_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved tin measurement (SN_DIS field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: SR_TOT
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable strontium in micrograms per liter

Field Name: MOD_SR_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable strontium measurement (SR_TOT field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: SR_DIS
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved strontium in micrograms per liter.

Field Name: MOD_SR_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved strontium measurement (SR_DIS field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: TH_TOT

Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable thorium in micrograms per liter

Field Name: MOD_TH_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable thorium measurement (TH_TOT field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: TH_DIS
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved thorium in micrograms per liter.

Field Name: MOD_TH_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved thorium measurement (TH_DIS field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: TI_TOT
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable titanium in micrograms per liter

Field Name: MOD_TI_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable titanium measurement (TI_TOT field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: TI_DIS
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved titanium in micrograms per liter.

Field Name: MOD_TI_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved titanium measurement (TI_DIS field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: TL_TOT
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable thallium in micrograms per liter

Field Name: MOD_TL_TOT
Field Type: Character
Field Format: A3

Field Description: A modifier for the total recoverable thallium measurement (TL_TOT field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: TL_DIS
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved thallium in micrograms per liter.

Field Name: MOD_TL_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved thallium measurement (TL_DIS field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: U_DIS
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved uranium in micrograms per liter.

Field Name: U_DIS_PCI_
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved uranium in picocuries per liter.

Field Name: MOD_U_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved uranium measurements (U_DIS and/or U_DIS_PCI_ fields). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: U_TOT
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable uranium in micrograms per liter

Field Name: MOD_U_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable uranium measurement (U_TOT field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: V_TOT
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable vanadium in micrograms per liter

Field Name: MOD_V_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable vanadium measurement (V_TOT field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: V_DIS
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved vanadium in micrograms per liter.

Field Name: MOD_V_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved vanadium measurement (V_DIS field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: ZN_TOT
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable zinc in micrograms per liter

Field Name: MOD_ZN_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable zinc measurement (ZN_TOT field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: ZN_DIS
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved zinc in micrograms per liter.

Field Name: MOD_ZN_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved zinc measurement (ZN_DIS field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: ZR_TOT
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable zirconium in micrograms per liter

Field Name: MOD_ZR_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable zirconium measurement (ZR_TOT field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: ZR_DIS
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved zirconium in micrograms per liter.

Field Name: MOD_ZR_DIS
Field Type: Character
Field Format: A3

Field Description: A modifier for the dissolved zirconium measurement (ZR_DIS
field). Values are -=below instrument sensitivity, +=above instrument
sensitivity.

Field Name: TSS_MG
Field Type: Numeric
Field Format: F16.6
Field Description: Total suspended solids in milligrams per liter.

Field Name: MOD_TSS
Field Type: Character
Field Format: A3
Field Description: A modifier for the total suspended solids measurement (TSS_MG
field). Values are -=below instrument sensitivity, +=above instrument
sensitivity.

Field Name: TDS_MG
Field Type: Numeric
Field Format: F16.6
Field Description: Total dissolved solids in milligrams per liter

Field Name: MOD_TDS
Field Type: Character
Field Format: A3
Field Description: A modifier for the total dissolved solids measurement (TDS_MG
field). Values are -=below instrument sensitivity, +=above instrument
sensitivity.

Field Name: T_PHOS_MG
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable phosphorus in milligrams per liter

Field Name: MOD_T_PHOS
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable phosphorus measurement
(T_PHOS_MG field). Values are -=below instrument sensitivity, +=above instrument
sensitivity.

Field Name: P_DIS_MG
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved phosphorus in milligrams per liter.

Field Name: MOD_P_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved phosphorus measurement (P_DIS_MG
field). Values are -=below instrument sensitivity, +=above instrument
sensitivity.

Field Name: PO4_DIS_MG
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved phosphate in milligrams per liter.

Field Name: MOD_PO4_DI
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved phosphate measurement
(PO4_DIS_MG field). Values are -=below instrument sensitivity, +=above
instrument sensitivity.

Field Name: SI_TOT_MG
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable silicon in milligrams per liter

Field Name: MOD_SI_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable silicon measurement
(SI_TOT_MG field). Values are -=below instrument sensitivity, +=above instrument
sensitivity.

Field Name: SI_DIS_MG
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved silicon in milligrams per liter.

Field Name: MOD_SI_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved silicon measurement (SI_DIS_MG
field). Values are -=below instrument sensitivity, +=above instrument
sensitivity.

Field Name: NA_TOT_MG
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable sodium in milligrams per liter

Field Name: MOD_NA_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable sodium measurement
(NA_TOT_MG field). Values are -=below instrument sensitivity, +=above instrument
sensitivity.

Field Name: NA_DIS_MG
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved sodium in milligrams per liter.

Field Name: MOD_NA_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved sodium measurement (NA_DIS_MG
field). Values are -=below instrument sensitivity, +=above instrument
sensitivity.

Field Name: CL_MG
Field Type: Numeric

Field Format: F16.6
Field Description: Dissolved chlorine in milligrams per liter.

Field Name: MOD_CL
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved chlorine measurement (CL_MG
field). Values are -=below instrument sensitivity, +=above instrument
sensitivity.

Field Name: F_MG
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved fluorine in milligrams per liter.

Field Name: MOD_F
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved fluorine measurement (F_MG
field). Values are -=below instrument sensitivity, +=above instrument
sensitivity.

Field Name: BR_MG
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved bromine in milligrams per liter.

Field Name: MOD_BR_MG
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved bromine measurement (BR_MG
field). Values are -=below instrument sensitivity, +=above instrument
sensitivity.

Field Name: HCO3_MG
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved bicarbonate in milligrams per liter.

Field Name: MOD_HCO3
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved bicarbonate measurement (HCO3_MG
field). Values are -=below instrument sensitivity, +=above instrument
sensitivity.

Field Name: CO3_MG
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved carbonate in milligrams per liter.

Field Name: MOD_CO3
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved carbonate measurement (CO3_MG
field). Values are -=below instrument sensitivity, +=above instrument
sensitivity.

Field Name: OH_MG
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved hydroxide in milligrams per liter.

Field Name: MOD_OH
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved hydroxide measurement (OH_MG field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: NH3_MG
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved ammonia in milligrams per liter.

Field Name: MOD_NH3_MG
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved ammonia measurement (NH3_MG field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: NO2_MG
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved nitrite in milligrams per liter.

Field Name: MOD_NO2
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved nitrite measurement (NO2_MG field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: NO3_MG
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved nitrate in milligrams per liter.

Field Name: MOD_NO3
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved nitrate measurement (NO3_MG field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: NO2_NO3_MG
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved nitrate plus nitrite in milligrams per liter.

Field Name: MOD_NO2_NO
Field Type: Character
Field Format: A3

Field Description: A modifier for the dissolved nitrate plus nitrite measurement (NO2_NO3_MG field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: K_TOT_MG
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable potassium in milligrams per liter

Field Name: MOD_K_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable potassium measurement (K_TOT_MG field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: K_DIS_MG
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved potassium in milligrams per liter.

Field Name: MOD_K_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved potassium measurement (K_DIS_MG field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: SO4_MG
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved sulfate in milligrams per liter.

Field Name: MOD_SO4
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved sulfate measurement (SO4_MG field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: BI_TOT
Field Type: Numeric
Field Format: F16.6
Field Description: Total recoverable bismuth in micrograms per liter

Field Name: MOD_BI_TOT
Field Type: Character
Field Format: A3
Field Description: A modifier for the total recoverable bismuth measurement (BI_TOT field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

Field Name: BI_DIS
Field Type: Numeric
Field Format: F16.6
Field Description: Dissolved bismuth in micrograms per liter.

Field Name: MOD_BI_DIS
Field Type: Character
Field Format: A3
Field Description: A modifier for the dissolved bismuth measurement (BI_DIS field). Values are -=below instrument sensitivity, +=above instrument sensitivity.

USGS PP 1651

Table - U.S. Geological Survey Professional Paper 1651 Data Fields Summary

Table/Field Name	Description
AnalyticMethod	
AnalyticMethodShortName	Short name of analytic method.
AnalyticMethodName	Full name of analytic method.
FieldSiteLocMaster	
SiteNumber	Unique field site identifier, and link to GIS database.
Elevation	Field site elevation from GIS, in feet.
StratigaphicUnit	Stratigraphic unit abbreviation from overlay with Animas River watershed study GIS GEOLOGY coverage.
Lithology	Rock type from overlay with Animas River watershed study GIS GEOLOGY coverage.
GeologicAge	Geologic age of rock at site from overlay with Animas River watershed study GIS GEOLOGY coverage.
LabName	
LabShortName	Short Name of lab performing analysis.
LabName	Long name of lab performing analysis.
MineSiteLocMaster	
AMLIMineID	Unique mine site identifier, and link to GIS database.
Elevation	Mine site elevation from GIS, in feet.
StratigarphicUnit	Stratigraphic unit abbreviation from overlay with Animas River watershed study GIS GEOLOGY coverage.
Lithology	Rock type from overlay with Animas River watershed study GIS GEOLOGY coverage.
GeologicAge	Geologic age of rock at site from overlay with Animas River watershed study GIS GEOLOGY coverage.
Parameter	
ParameterCode	Unique 20-character (maximum) code designating a specific result.
ParameterName	255-character field describing specific result.
Ppcode	STORET codes used by Water Resources Discipline.
ConstituentName	Element name or similar chemical group.
PoreSize	Filter/pore size for separated samples.
ReportUnits	Units of measurement.
Project	
ProjectCode	Unique 10-character project code.
ProjoectName	Name of project.
ProjectChief	Person in charge of project.
ProjectDataPerson	Data contact person for project.
ScientistPhone	Phone number of project chief.
ScientistEmail	E-mail address of project chief.
PublicationNumber	Publication number for project publication.
PublicationName	Publication name for project publication.
QualitativeResult	
QualResultID	Unique value for qualitative result record.
SampleID	Foreign key from Sample table; unique identifier for sample record.
QualValue	Qualitative value.
ParameterCode	Foreign key code from Parameter table; unique 20-character (maximum) code designating a specific result.
AnalyticalMethodShortName	Foreign key from Analytic Method table; short name of analytic method.
LabShortName	Foreign key from LabName table; short name of lab performing analysis.
FilterPoreSize	Description of filter size.
Result	
ResultID	Unique value for result record.
SampleID	Foreign key from Sample table; unique identifier for sample record.
Value	Numeric result.
ValueRemarkCode	Modifer for result; <: less than lower detection limit, >: greater than upper detection limit, E: estimated value, Q: lower detection limit halved.
ParameterCode	Foreign key code from Parameter table; unique 20-character (maximum) code designating a specific result.
AnalyticMethodShortName	Foreign key from AnalyticMethod table; short name of analytic method.
LabShortName	Foreign key from LabName table; short name of lab performing analysis.
FilterPoreSize	Description of filter size.
ValueComments	Miscellaneous comments about result.
Sample	
SampleDate	Day sample was taken, in mmddyyyy.
SampleTime	Time sample was taken, in military time.
SampleMediaCode	Foreign key from SampleMedia table; unique identifier for sample media record.
SampleDepth	Depth to sample, in SI units.
CollectionMethod	Method used to collect sample.
SamplePreparation	General description of sample preparation procedures.
SampleComment	Additional comments about sample.
FieldLithology	General description of rock type determined in the field.
FieldStratUnit	Stratigraphic unit determined in the field.
SampleCollector	Collector of sample.
SampleMedia	
SampleMediaCode	Unique identifier for sample media record.
MediaType	General media category; i.e., rock.
Sub-type	More specific media sub-category; i.e., igneous.
Site	
SiteNumber	Unique field site identifier.
SiteName	Text name such as 'Boulder Creek at mouth'.
SiteComment	Miscellaneous comments about site.
AMLIMineID	Foreign key from MineSiteLocMaster table; unique mine site identifier, and link to GIS database.
AMLIAnalysisID	Foreign key from SpatialAnalysisSites table; ID (key) assigned to a spatial analysis site.
PPSiteLabel	ID used to identify this site if different from SiteNumber.
Latitude	Latitude from scientist's data base and resolved by GIS, in decimal degrees.
Longitude	Longitude from scientist's data base and resolved by GIS, in decimal degrees.

Table - U.S. Geological Survey Professional Paper 1651 Data Fields Summary

| Table/Field Name	Description
SiteType	General site type, i.e. ground water, surface water, tailings, etc.
DrainageArea	Drainage area of basin upstream of site, in square miles.
SegmentID	ID for stream segments.
ProjectCode	Foreign key from Project table; unique 10-character project code.
SiteCategory	Manmade disturbances upgradient or upstream from water-quality sampling site; 1: none, 2: potentially some, 3: some, 4: definite.
Stream	Stream on which site is located (if applicable).
FieldElevation	Elevation of site, not from GIS, in feet above mean sea level.
MineSiteType	Type of feature at mine site.
Shafts	Number of shafts in mine.
Adits	Number of adits in mine.
FlowingAdits	Number of flowing adits in mine.
AditDrainsOverWaste	Whether adit drainage flows over mine waste dump.
LowFlowLowRge	Low-flow rate, low range, in gallons per minute.
LowFlowHighRge	Low-flow rate, high range, in gallons per minute.
KillZone	Presence of a kill zone.
MineWasteVolume	Volume of mine waste, in cubic yards.
DisturbedAreaSize	Size of disturbed area, in square meters.
DistanceToStream	Distance of mine site to stream, in meters.
MillMethod	Mill method.
MillBuiltDate	Date mill or smelter was built or re-modeled.
MillProduction	Mill production, in tons per day.
MillAmalgam	Whether amalgamation process was used at mill.
CDMGReference	Colorado Division of Minerals and Geology publication reference.
SpatialAnalysisSites	
AMLIAnalysisID	ID (key) assigned to a spatial analysis site.
NumofFieldSites	Number of field sites at a specific spacial analysis site.
SiteNumber1	Name of field site at a specific spatial analysis site, or first field site if there are more than one.
SiteNumber2	Name of second field site at a specific spatial analysis site, if applicable.
SiteNumber3	Name of third field site at a specific spatial analysis site, if applicable.
SiteNumber4	Name of fourth field site at a specific spatial analysis site, if applicable.
SiteNumber5	Name of fifth field site at a specific spatial analysis site, if applicable.
SiteNumber6	Name of sixth field site at a specific spatial analysis site, if applicable.
SiteNumber7	Name of seventh field site at a specific spatial analysis site, if applicable.
SiteNumber8	Name of eighth field site at a specific spatial analysis site, if applicable.
SiteNumber9	Name of ninth field site at a specific spatial analysis site, if applicable.
SiteNumber10	Name of tenth field site at a specific spatial analysis site, if applicable.
SiteNumber11	Name of eleventh field site at a specific spatial analysis site, if applicable.
Elevation	Elevation of analysis site from GIS, in feet; null if outside of study area.
StratigraphicUnit	Stratigraphic unit abbreviation from overlay with Animas River watershed study GIS GEOLOGY coverage.
Lithology	Rock type from overlay with Animas River watershed study GIS GEOLOGY coverage.
GeologicAge	Geologic age of rock at site from overlay with Animas River watershed study GIS GEOLOGY coverage.
Longitude	Longitude of analysis site from GIS, in decimal degrees.
Latitude	Latitude of analysis site from GIS, in decimal degrees.
UTM_Easting	UTM Easting Coordinate of site from GIS, in Zone 13, NAD27, in meters.
UTM_Northing	UTM Northing Coordinate of site from GIS, in Zone 13, NAD27, in meters.
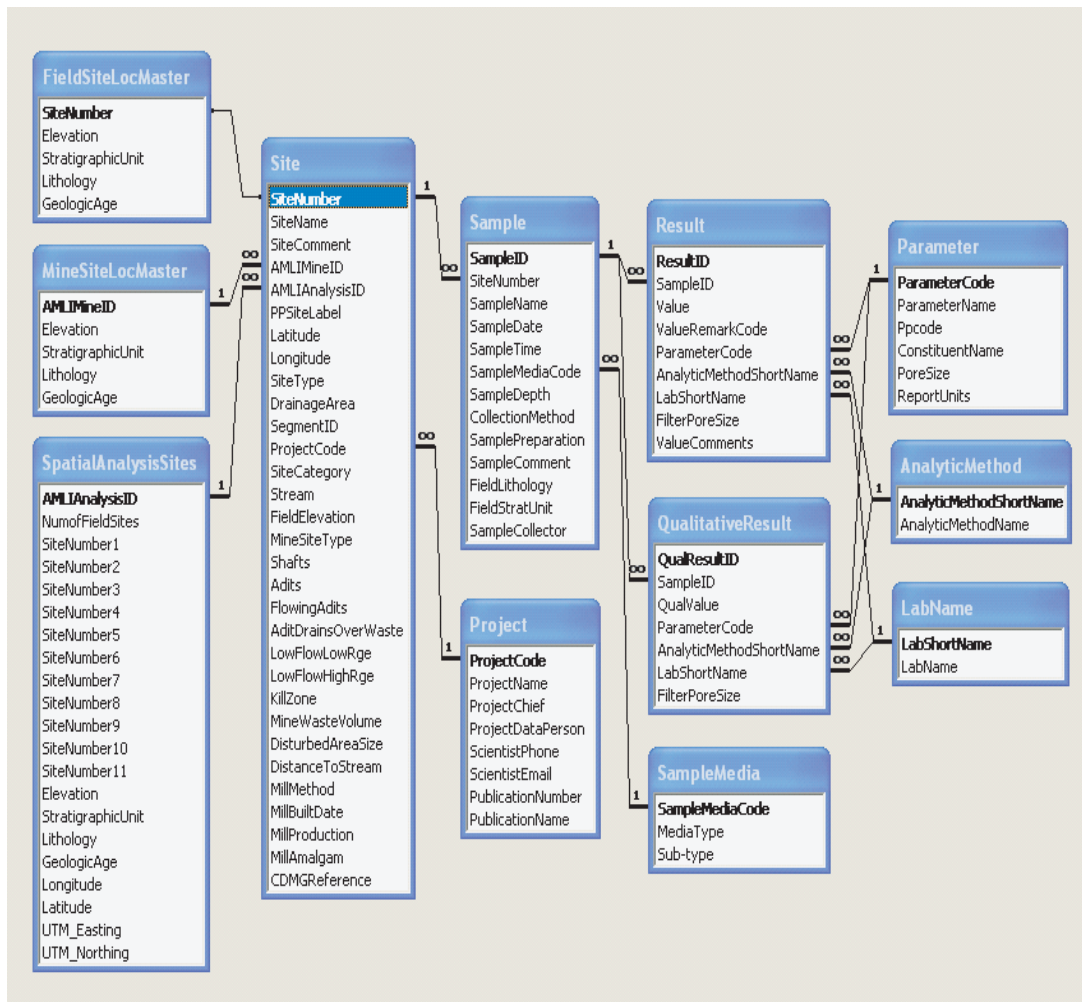
Figure 3.   Tables in relational database and relationships between tables.

The FIELD_SITES and ANALYSIS_SITE coverages exist on the Animas River watershed CD-ROM as export files in the \animas_cd\gis_db\sitedata\e00 directory. These coverages and tables also exist as ESRI shapefiles and DBF files, respectively, in the \animas_cd\gis_db\sitedata\shape and \animas_cd\gis_db\sitedata\dbf directories.

Mine-Related Site Data

An inventory of inactive mines and mine-related sites in the Animas River watershed study area was compiled from existing State and Federal sources. The data include significant mines, mills, and mill tailings sites. This inventory of mine-related data provides detailed site characterization, including flowing adits, as well as the size and distribution of mine and mill waste.

In some cases, multiple shafts, adits, prospects, and mined areas of disturbance were located at a given site, but in each case a single point location was chosen to best represent the entire site. Several points were used, however, to represent some mine sites that are composed of multiple levels. The location of each mine-related site was verified where possible with digital orthophoto quadrangle (DOQ) images, and by persons with local knowledge of the area.

Three hundred and seventy-four mine-related sites are stored in an ArcInfo coverage called MINE_SITES, which exists on the Animas River watershed CD-ROM as an Arc Interchange export file in the \animas_cd\gis_db\sitedata\e00 directory. A detailed description of the mine inventory data is in Church, Mast, and others (this volume).

In addition, the MINE_SITES coverage and related tables are also available on the Animas River watershed CD-ROM as an ESRI shapefile and DBF files, respectively, in the \animas_cd\gis_db\sitedata\shape and \animas_cd\gis_db\sitedata\dbf directories. The mine-related site data are also part of the Animas River watershed relational database, which is described later in this chapter.

Appendix C

Database Information and Analysis

The information provided here is from an analysis of available database information during the inventory of available electronic AML inventories. Although requested, data dictionaries, structures, and table/field names were not provided to the CGS by the BLM and CDRMS. Summaries of the database field names and structures, if available, are included in Appendix B.

Generally, each AML database has its own design and tables are related or linked together with the use of a unique identification number (unique id) and/or primary key. For example, a table called "Site" contains individual records that contain information associated to a mine site, one AML inventory area, or could be associated with many different abandoned mines. Due to the inherent issues with defining and naming individual mines, a site could be defined as an area were multiple AML features (e.g. adits, shafts, etc.) were observed. In the USFS CGS AML database the "Site" table is linked to the "Mine Piles" table by a one-to-many relationship indicating that each site has multiple mine piles with their own attributes. A summary of tables in several databases is included as Table C1.

Although the primary databases contain similar information about AML, the format of the individual data fields and their definitions can vary. For example, most of these databases contain information associated with the longitude (easting) of mine features. The databases contain fields associated with longitude and the field names vary: Long_ddeg_NAD83 (NPS AML), EASTING (BLM AMSCM), LONG_DD (USFS CGS AML), etc. Although these fields contain longitude information, the available information is also in different geographic projections and formats. When comparing primary database, there are many examples like the one above. In order to better present and compare the information contained in these databases, field names from each table were grouped and assigned to general subjects and information categories as shown in Table C2.

As shown in Table C2, the primary databases contain fields associated with about nine general subjects which were then summarized into 39 general categories. General subjects and examples of categories/field names (in parenthesis) include:

- Name (project name, site name, mine name, claim name, etc.);
- Location (northing, easting, UTM Zone, county, state, elevation, etc.);
- Mine Information (commodity, mine type, production, mine district);
- Property Information (ownership, area, land use, accessibility, etc.);
- Features (type, characteristics, status, hazard, ranking, rating, etc.);
- Mitigation (status, reclamation, cost, funds, etc.);
- Natural Environment / Cultural Resources / Environmental (water, discharge, wildlife, geology, vegetation, cultural resources, etc.);
- Samples (sample results, sample information); and
- Other (comments, photographs, dates, data sources, etc.).

In order to determine if similar data fields exist in each database, the categories were compared between databases. Table C3 shows this comparison and the differences between field categories and each database. Only two categories, northing and easting, are present in all of the databases however, the northing and eastings are in different coordinate systems. Table C4 includes a detailed breakdown of the actual field names, databases, and tables associated with each subject/category.

Based on this preliminary assessment of database fields in the primary AML databases, there are field names that seem generally similar between some of the databases and likely contain similar information. Examples include the following:

- Name - site name / mine name / claim name / alias;
- Location - northing / easting / UTM zone / datum / county / quadrangle / state / elevation;
- Property Information – ownership / mine operator / permittee;

- Features – feature / feature characteristics; and
- Samples – sample results / sample information.

These are general examples and there may be issues with combining these data into a single field. For example, site names vary between databases and could refer to a general area that may or may not be associated with a mine or claim name. Additionally, although property ownership is generally recorded, the actual field names and information contained in the database may include the land owner, mineral owner, or site owner.

AML site features may also be recorded in different ways. This may include counts of certain features as identified in the BLM field names (e.g. BLM AMSCM NO_HEAPS or number of heaps, NO_OP_SHFT or number of open shafts) while the USFS CGS AML database contains the field HTYPE in the Mine Openings table for the actual feature type (e.g. adit, vertical shaft, stope, etc.) (Table C4). Sample results are generally referenced in some of the databases and the USFS CGS AML database contains analytical laboratory results. Although the primary databases may have similar fields, some of the fields are only used sparingly in the actual databases.

Unique record identifiers associated with individual sites and/or features vary between agencies. For example, the unique identifiers associated with sites in the USFS CGS AML database are a 13 digit number that combines the USFS region number, state id number, forest id number, ranger district number, UTM zone, easting (the x coordinate of the lower left corner of the 1000 meter UTM grid containing the majority of the inventory area), northing (the y coordinate of the lower left corner of the 1000 meter UTM grid containing the majority of the inventory area), and area identification number (Table C4). A three digit sequential identification number is then concatenated to the end of this unique identification number to identify individual mine openings, waste piles, water samples, etc., associated with the site. Other databases contain different unique identification numbers thereby making it difficult to correlate site/features between databases.

Table C1
Summary of Select AML Database Tables

Database	Database Tables (Field Count)	General Table Descriptions
BLM AMSCM	Unavailable (?)	Unavailable.
CDRMS Brass Caps	Unavailable (?)	Unavailable.
DOE AUM/DRUM	tbl_Location (14)	Location information including latitude, latitude, and datum.
	tbl_Mine_MineGroup (16)	Mine names, distance to roads/streams/etc., other agency ids, etc.
	tbl_OwnerOperator (7)	Site owner, operator, permittee, information sources, etc.
	tbl_Production (3)	Mine size and production comments.
	tbl_MineStatus (5)	Mine status and comment.
	tbl_MineFeatures (13)	Number of adits, waste piles, areas/volumes of waste piles, number or description of pits/shafts/debris/miscellaneous/structures, and comments.
	tbl_MineType (2)	Mine type.
	tbl_LandOwner (10)	Land owner names, mineral rights owner, and comments.
	tbl_LandOwner….(2)	Land owner contact.
	tbl_Cost (7)	Cost, descripiton of cost, year of cost data, and comments.
	tbl_RadGamma (11)	Gamma range background/waste piles, average gamma measurements, maximum gamma measurements, comments, units, etc.
	tbl_RadSoil (8)	Average soil radium-226, range, background, units, and comments.
	tbl_RadRadon (8)	Average radon measurement, range, background,units, and comments.
	tbl_SurfaceWaterData (4)	Comment, data source.
	tbl_GroundwaterData (4)	Comment, data source.
	tbl_Status (3)	Mine status, description.
	tbl_MineProduction (10)	Tons of ore produced, pounds of uranium oxide produced, percent grade, years of production, comments.
	tbl_CoordStatus (2)	Coord status.
	tbl_DataSources (9)	Data source name, type, originator, description, comment, file name/path, etc.
	tbl_Location_DataSource (2)	Data sourceID.
	tbl_Comments (9)	Comment, comment by, comment date, action required/completed/description, source of information.
	tbl_VisualCheck (10)	Unique ID, visibility on aerial photo / USGS topo, checked by/date, comment, action required/completed/description.
	tbl_MineCategory (2)	MineID, etc.
	tblCategories (2)	Category.
	tbl_VisualCheck (2)	Description of visual check.
NPS AML	Site/General (20)	General site location, site name, watershed, ownership, acres, other ids, compliance date, site notes, etc.
	Site Geological Resources (3)	General/specific commodity, geology notes.
	Site Natural Resource Impacts (12)	Impacts in need of mitigation, effluent, standing water, tailings water, staining, sediment, vegetation, estimated volumes, other impacts, etc.
	Site Cultural Resources (6)	Cultural resource evaluation, cultural landscape, notes, etc.
	Feature Identification / Status - General (11)	Identification numbers, feature type, actiion required, high risk, source, notes, etc.
	Feature Access (7)	Information on site access including method, distance to road/path, wilderness, evidence of visitation, etc.
	Feature Geographic Description (16)	Latitude, longitude, elevation, UTM zone, quadrangle, range, township, etc.
	Feature Dimensions (7)	Dimensions of site features (depth, distrubed area, width, length, etc).
	Feature Biological Resources (5)	Threatened and endangered species, other species of concern, bats, notes.
	Feature Hazards (12)	Hazard information (debris/highwall/rockfall/fall/flooded/explosives/bad air/subsidence/fire/substances), notes.
	Feature Mitigation Required - Specific (10)	Mitigation information including options, cost, optional costs/mitigation, ids, notes on mitigation.
	Feature Mitigation Completed - Specific (10)	Mitigation information included temporary migation, data feature was mitigated/reclaimed, cost of mitigation, source of funding, partners, and notes.
	Feature Sample and Ranking Data (12)	Water sample, pH, background pH, water/soil information, notes, access/resource/impact ratings.
	Feature Monitoring (2)	Notes, dates.
USFS CGS AML	Inventory Areas (58)	Information associated with general sites that were inventoried including latitude, longitude, number of holes, number of piles, location information, site name, commodity, stream/town/road information, areas reclaimed, type of access/terrain, vegetation, bats, environmental/physical hazard rating, etc.
	Mine Openings (26)	Information associated with mine openings including location information, hole id, type of opening, deminesions, condition, drainage, radiation counts, access deterrent, environmental/physical hazard rating, comments.
	Mine Piles (36)	Information associated with mine piles, location information, pile id, dimensions, volume, slope information, type of pile, vegetation, drainage, stability, access deterrent, environmental/physical hazard rating, comments.
	Water (24)	Unique water id, ph/conductivity/flow water measurements, location, discharge measurement method, comments, etc.
	Samples (230)	Sample site description, basin, sample date/time, water source type, comments, location information, discharge information, field analytical results, laboratory analytical results (most of these fields are associated with laboratory analyte names/results).
	Photo Points (10)	Film roll, frame numbers, date, site name, feature area number, notes, etc.
	Photo Final (16)	Roll name, frame number, date, site name, phot notes, unique id, date, notes, etc.
USGS PP 1651	AnalyticMethod (2)	Analytical method name.
	FieldSiteLocMaster (5)	Field site elevation, stratigraphic unit, and other geological information.
	LabName (2)	LabName
	MineSiteLocMaster (5)	Unique mine site identifier, elevation, and geological information.
	Parameter (6)	Analysis parameter name, coldes, constituent names, pore size, and units.
	Project (8)	Project code, name, contact names/phone/email, publication reference.
	QualitativeResult (7)	Unique value, qualititative value, parameter code, analytical names, filter size, etc.
	Result (9)	Unique value, numeric results, modifer, filter size, comments, etc.
	Sample (10)	Sample date/time/media/depth/method/preparation, comment, geological information, sampler, etc.
	SampleMedia (3)	Media types and sub-types.
	Site (31)	Site name, number, comment, AMLIMine ID, latitude, longitude, site type, site category, stream, number of adits, shafts, flowing adits, adits that drain over waste, discharge, kill zone, waste volume, disturbed area, mill information, reference, etc.
	SpatialAnalysisSites (21)	Number of field sites at specific spacial analysis site, names of field sites, elelvation, geological information, longitude, latitude, UTM zones, etc.

NOTES:
AML - abandoned mine land
BLM - U.S. Bureau of Land Management
CDRMS - Colorado Division of Reclamation, Mining, and Safety
CGS - Colorado Geological Survey
DOE AUM/DRUM - Department of Energy, Abandoned Uranium Mine/Defense-Related Uranium Mine
NPS - National Park Service
USFS - United States Forest Service
USGS PP - United States Geological Survey Professional Paper
UTM - Universal Transverse Mercator

General Subject	General Category	Field Description Examples
Name	Project / Site Name	Project, name of inventoried project area, site name, site name 1, etc.
	Alias	Alias name, secondary mine names, alternative name, site name 2, etc.
	Mine Name	Mine name, primary mine name.
	Claim Name	Mine claim name, also referred to as Mine Name in the DOE data field description.
Location	Northing	Northing, latitude, degrees/minutes/seconds of latitude for mine locations, nearest 1,000 meter grid northing, NAD 1927 latitude, NAD 1983 latitude, etc.
	Easting	Easting, longitude, degrees/minutes/seconds for mine location, nearest 1,000 meter grid easting, NAD 1927 latitude, NAD 1983 latitude, etc.
	UTM Zone/Datum	Datum, horizontal datum of longitude/latitude, UTM Zone, UTM Zone Easting, UTM Zone Northing, UTM Zone Code for different features (e.g. mine openings, piles, photos, etc.).
	Location Other	Township, range, driving directions, meridian, subdivision, section, quarter sections, location confidence, map index number, mining loctlity, coordinate status, USGS topo id, quadrant, location accuracy, region, GPS year, congressional district, ranger district code, forest code, state code, type of terrain, date of map, national forest name, etc.
	County	County name, inventory area county, etc.
	Quad	USGS quadrangle name.
	State	State name or code.
	Elevation	Elevation, portal elevation, elevation of sample location, elevation of inventory area, etc.
Mine Information	Commodity	Sulfide mineral, primary commodity mined, product of mining efforts, specific/general commodities, etc.
	Mine Type	Mine type, site type, underground mine, surface mine, etc.
	Production	Tons of uranium ore produced, last year of uranium production, desicrption of uranium production size, first year of uranium production, coal production information, etc.
	Mine District	Mining district name.
Property Information	Ownership	Ownership, mixed, private, mineral owner, surface owner, contact name, comments, land owner, etc.
	Property/Mine/Inventory Area	Property size, acres, site acrews, mine area, estimate size of surface disturbance, outer boundary of inventory area, etc.
	Human/ Land Use (in Area)	Human use, recreation, land development, populated, adjacent land use, distance to population center, distance to trail/camp/dwelling/town, etc.
	Access (Site) / Roads	Access to site, difficulty, distance to road/path, type of access, etc.
	Mine Operator / Permittee	Operator, secondary operator, permittee, owner information source, permittee information source, etc.
	Visibility	How visiible to visitors and/or from trails, roads, etc.
	Active/Inactive Mine	Recent mineral activity, used administratively by agency, etc.
Features	Feature/Feature Characteristics	Structures, headframes, adits, shafts, sizes of openings, numbers of ponds/dams/mills/tailings/etc., declines, tunnels, stopes, inclines, chemical piles, waste rock, tailings, depth of feature, eroded dimensions, equipment, debris, mine dump volume, closed adits, prospects, homesites, high walls, pits, disturbed areas, notes, rockfall, stains, volume estimates, degree of cementation, steepest slope angle in dump material, grain size of dump material, feature name, etc.
	Status	Some overlap with mitigation, status, action required, data action was completed, descriptoin of action, mine status, mine status description, comment, date checked, date of reclamation, date of temporary closure, etc.
	Hazard	Type of hazard (physical, environmental, etc.), slope instability, rescue, subsidence, bad air, explosives, fall, hazards in need of mitigation, other impacts, hazard notes, nonts on resource impacts, underground fire, etc.
	Ranking / Rating	Access rating, resource rating, impact rating, hazard rating, extensiveness of workings, physical hazard rating, environmental hazard rating, environmental degradation rating, etc.
	Inspection / Inspected By	Inspected by, date of inspection, evaluator, monitoring date, monitoring observation, etc.
Mitigation	Mitigation / Mitigation Status / Reclamation	Mitigation, mtitgation status, signs, lining, preferred/alternative closure methods, depth to plug, existing access deterrents, excavated dimensions, construction dimensions, compliance date, natural reclamation, mitigation technique, resource impacts/mitigation, partners, notes, mitigated by, options, condition of access deterrent, number of acres reclaimed, etc.
	Cost / Funds	Comments in the cost table, year of cost data, description, actual cost, optional costs, mitigation cost, mitigation funds, etc.
Natural / Cultural / Environmental	Water / Discharge	Flow, discharge, waste rock water, tailing water, staning water, water type, drainages, distance to stream, distance to well, comments, sedimentation, watershed, effluent, description of draining water, discharge methods, units, basin, etc.
	Wildlife	Wildlife, animal description, possible bat habitat, biology notes, species of concern, evidence of bat activity, etc.
	Geology / Surface Material / Coal Data	Surficial material, depth to bedrock, coal geology (thickness, name, age, region, methane data, sulfur, etc), geology notes, etc.
	Vegetation	Vegetation condition, revegetation description, vegetation type, density, etc.
	Environmental	A broad category (other fields that may be associated with environmental exist), notes on contamination, hazardous substances, stained soil, asbestos, underground storage tank, petroleum chemicals, odors, etc.
	Wind Erosion	Wind erosion, description of susceptibility to wind erosion, etc.
	Cultural Resources	Specific information associated with cultural resources mainly from the NPS AML database including: notes, interpretation, eligibility, cultural landscape, national register, and general informaiton on the existence of cultural resources.
Samples	Sample Results	Radiation measurements, average radon, units, gamma measurements, radon background, pH, conductivity, field measurement results, dissolved/total laboratory water analytical results (over 200 in the USFS AML database), etc.
	Sample Information	Number of samples, type of sample (soils, tailings, waster rock, water, etc.), agency, description of sample site, date/time of sample, comment, type of water source (e.g. adit shaft, portal, stream, leachate, seep, etc.), laboratory, sampler, date laboratory received sample, etc.
Other	IDs**	A broad category (includes many database primary keys for relating tables, etc.), unique id, epa designated mine identification number, internal ID, federal information processing standards code, DOE unique id, aerial id, PMIS number, CERCLA number, facility management sofware system ids, CAMLU feature number, FMSS asset ID, PEPC numbers, Park ID, area ID, feature IDs, hole identification number, pile idenfication number, water sample identification number, etc.
	Comments	Comments may be associated with field notes, field descriptions, remarks, location comments, who made the comment, date comment was made, other ID numbers, etc.
	Photograph	Photograph, notes, number of photos, date, frame, photo id, site name, etc.
	Date	Date, date added, revision date, photo date, etc.
	Unknown	Unknown fields with limited descriptions.
	Reference / Data Source	Reference, data source name, data source type, comments, file name, source, etc.
	Project Manager / Recorder	Project manager, added by, recorder, etc.

NOTES: General categories may include information from other data types. Data fields were assigned to these general categories here for analysis purposes only.
Data field names and descriptions were not provided directly from the BLM and CDRMS therefore, the 2014 DOE report (DOE, 2014) was used to determine the data fields.
Data dictionaries were not available for several of the databases including the BLM AMSCM and CDRMS Brass Caps.
Field inventory sheets were used to indicate data collected and likely input into the BLM AMSCM and CDRMS Brass Cap databases based on communications with these agencies.
Although there may be data fields in these categories, these fields may not be present and/or populated in the actual database.
** IDs include database generated ID numbers, unique ID numbers, etc.
BLM - U.S. Bureau of Land Management
CDRMS - Colorado Division of Reclamation, Mining, and Safety
CGS - Colorado Geological Survey
DOE - Department of Energy
NAD - North American datum
NPS - National Park Service
USFS - United States Forest Service
USGS - United States Geological Survey
UTM - Universal Transverse Mercator

Table C3
Summary of Database Fields by General Information Category

Subject	General Category*	BLM AMSCM: Data Fields from BLM Field Inventory Data Sheet	BLM AMSCM: Data Fields from DOE Report	CDRMS Brass Caps: Data Fields from CDRMS Field Data Sheet	CDRMS Brass Caps: Data Fields from DOE Report	DOE AUM/DRUM	NPS Abandoned Mine Land Database	USFS CGS Abandoned Mine Land Database	USGS PP 1651 Database
Name	Project / Site Name	x		x	x		x	x	x
	Alias		x		x	x		x	
	Mine Name		x	x					x
	Claim Name			x		x			
Location	Northing	x	x	x	x	x	x	x	x
	Easting	x	x	x	x	x	x	x	x
	UTM Zone/Datum	x	x	x	x	x	x	x	x
	Location Other		x	x	x	x	x	x	x
	County		x	x	x	x	x	x	
	Quad		x	x			x	x	
	State		x		x	x	x	x	
	Elevation		x	x			x	x	x
Mine Information	Commodity		x		x		x	x	
	Mine Type					x	x		
	Production					x			x
	Mine District					x		x	
Property Information	Ownership	x	x	x	x	x	x		
	Property/Mine/Inventory Area	x			x	x	x	x	x
	Human/ Land Use (in Area)		x	x		x		x	
	Access (Site) / Roads		x			x	x	x	
	Mine Operator / Permittee					x			
	Visibility		x				x		
	Active/Inactive Mine				x		x		
Features	Feature/Feature Characteristics	x	x	x	x	x	x	x	x
	Status		x			x	x		
	Hazard	x	x				x		
	Ranking / Rating		x				x	x	
	Inspection / Inspected By	x	x				x		
Mitigation	Mitigation / Mitigation Status / Reclamation	x	x	x			x	x	
	Cost / Funds					x	x		
Natural / Cultural / Environmental	Water / Discharge		x	x		x	x	x	x
	Wildlife		x	x			x	x	
	Geology / Surface Material / Coal Data			x			x		x
	Vegetation		x				x	x	x
	Environmental		x				x		
	Wind Erosion		x					x	
	Cultural Resources						x		
Samples	Sample Results				x	x	x	x	x
	Sample Information				x		x	x	x
Other	IDs**		x	x	x	x	x	x	x
	Comments	x	x	x		x	x	x	x
	Photograph	x	x	x				x	
	Date		x	x	x		x	x	
	Unknown		x			x			
	Reference / Data Source					x	x		x
	Project Manager / Recorder			x	x			x	x

NOTES: General categories may include information from other data types. Data fields were assigned to these general categories here for analysis purposes only.

Data field names and descriptions were not provided directly from the BLM and CDRMS therefore, the 2014 DOE report (DOE, 2014) was used to determine the data fields.

Data dictionaries were not available for several of the databases including the BLM AMSCM, CDRMS Brass Caps, and the CGS Historic Coal Mine Database.

Field inventory sheets were used to indicate data collected and likely input into the BLM AMSCM and CDRMS Brass Cap databases based on communications with these agencies.

Although there may be data fields in these categories, these fields may not be populated in the actual database.

* Can include other information with regards to category name.

** IDs include database generated ID numbers, unique ID numbers, etc.

AMSCM - Abandoned mine site conceptual model
AUM/DRUM - Abandoned uranium mines, defense-related uranium mines
BLM - U.S. Bureau of Land Management
CDRMS - Colorado Division of Reclamation, Mining, and Safety
CGS - Colorado Geological Survey
DOE - Department of Energy
NPS - National Park Service
USFS - United States Forest Service
USGS PP - United States Geological Survey Professional Paper
UTM - Universal Transverse Mercator

General Category	Database Name	Data Field Name	Description	Database Table Name
Access	BLM AMSCM from DOE Report	ACCESSIBIL		
		DIFFICULTY	Driving conditions	
		VEHICLE_AC		
	DOE Abandoned Uranium Mines	DistanceToRoad	Distance to Road	tbl_Mine_MineGroup
	NPS Abandoned Mine Land Database	Access_Notes	Notes on Access	Feature Access
		Evid_Visit	Evidence of visitation	Feature Access
		Method	Access Method	Feature Access
		Dist_road	Distance from drivable road (tenths of miles)	Feature Access
		Dist_path	Distance from established path (tenths of miles)	Feature Access
	USFS CGS Abandoned Mine Land Database	NEAR_ROAD	Nearest road	Inventory Areas
		DIST_ROAD	Distance to nearest road	Inventory Areas
		ACCESS_T	Type of access (e.g. T = trail, G = gravel road, etc.)	Inventory Areas
		ACCESS_Q	Quality of access (e.g. G = good, P = poor, etc.)	Inventory Areas
Active / Inactive	CDRMS from DOE Report	REC_MINACT	If there is evidence of recent mineral activity (within the last year) select Y from the menu list. If there is no evidence of recent mineral activity then select N from the menu list. If it is unknown whether there is evidence of recent mineral activity	
		MINACT_DES	Describe the evidence of recent mineral activity observed (e.g., fresh cuts on working face of an open pit	
	NPS Abandoned Mine Land Database	Admin_Use	Yes/No/Unknown - Is the site used administratively by NPS, e.g., sand/gravel quarry for park roads?	Site - General
Alias	BLM AMSCM from DOE Report	DB_ALIAS		
	CDRMS from DOE Report	DB_ALIAS	Data source code	
		DB_ALIAS	A numeric reference to identify each record with its original database.	
	CGS Historic Coal Mines Database	SecondaryMineName(1)		tblMines
		SecondaryMineName(2)		tblMines
	DOE Abandoned Uranium Mines	AltName	Alternate Mine Name	tbl_Mine_MineGroup
	USFS CGS Abandoned Mine Land Database	SITENAME_2	Site Name 2 (Second Alias)	Inventory Areas
Claim Name	CDRMS Field Data Sheet	Claim Name		
	DOE Abandoned Uranium Mines	ClaimName	Mine Name	tbl_Mine_MineGroup
Comments	BLM AMSCM Field Inventory Data Sheet	Field Notes and Comments		
	BLM AMSCM from DOE Report	FIELD_NOTE	Field notes	
	CDRMS Field Data Sheet	Field Description		
	DOE Abandoned Uranium Mines	Comment	Location Comment	tbl_Location
		Comment	Comment	tbl_Comments
		CommenyBy	Who Made the Comment	tbl_Comments
		CommentDate	Date Comment Was Made	tbl_Comments
		CommentSource	Source of Information	tbl_Comments
	NPS Abandoned Mine Land Database	Site_Notes	Include other ID numbers from different databases or additional PEPC numbers here.	Site - General
	USFS CGS Abandoned Mine Land Database	Comments	Comments	Inventory Areas
	USGS PP 1651	SiteComment	Miscellaneous comments about site.	Site
Commodity	BLM AMSCM from DOE Report	SULFMINTYP		
		SULF_MIN		
		PRI_COMDTY		
		IND_METAL_		
	CDRMS from DOE Report	PRI_COMDTY	The entry is a numeric field with 3 spaces provided. Enter the primary commodity being mined from ORCA Commodity Code Data Dictionary 2303	
		COMMODITY	Product of mining efforts	
	NPS Abandoned Mine Land Database	Commod_Specif	Commodities (specific)	Site Geologic Resources
		Commod_Gen	Commodity (general)	Site Geologic Resources
	USFS CGS Abandoned Mine Land Database	COMMOD_T	Type of commodity mined in the area (e.g. gold, silver, etc.)	Inventory Areas
		COMMOD	General commodity mined code (e.g. M = metals, C = coal, etc.)	Inventory Areas
Cost	DOE Abandoned Uranium Mines	Comment	Comment	tbl_Cost
		Year	Year of Cost Data	tbl_Cost
		Description	Description of Cost	tbl_Cost
		Cost	Cost	tbl_Cost
	NPS Abandoned Mine Land Database	Opt2_Cost	Estimated cost of Option 2.	Specific Feature Mitigation Required
		Mitig_Funds	Source of funding	Specific Feature Mitigation Completed
		Mitig_Cost	Cost of mitigation ($)	Specific Feature Mitigation Completed
		Opt2_Cost_Year	Year of mitigation cost estimate for Option 2.	Specific Feature Mitigation Required
		Opt1_Cost	Estimated cost of Option 1	Specific Feature Mitigation Required
		Opt1_Cost_Year	Year of mitigation cost estimate for Option 1.	Specific Feature Mitigation Required
County	BLM AMSCM from DOE Report	COUNTY		
		COUNTY_NAM	County name	
	CDRMS Field Data Sheet	County		
	CDRMS from DOE Report	COUNTYNAME	The name of the county where the mine is located	
	DOE Abandoned Uranium Mines	County	County Name	tbl_Location
	NPS Abandoned Mine Land Database	County	if more than one county, pick primary and list other in Site_Notes	Site - General
	USFS CGS Abandoned Mine Land Database	COUNTY	Inventory area county	Inventory Areas
Cultural Resources	NPS Abandoned Mine Land Database	Cult_Notes	Notes on cultural values	Site Cultural Resources
		Interpret	Is site interpreted?	Site Cultural Resources
		Eligible	Eligible for National Register listing?	Site Cultural Resources
		Landscape	Has the park declared this a cultural landscape?	Site Cultural Resources
		Register	National Register listing or nomination?	Site Cultural Resources
		CultRes_Signif	Significant cultural resource values?	Site Cultural Resources
Date	BLM AMSCM from DOE Report	DATE_		
	CDRMS Field Data Sheet	Date		
	CDRMS from DOE Report	DATEADDED	Date record was created in database.	
	NPS Abandoned Mine Land Database	Rev_Date	Revision Date (MM/DD/YYYY)	General Feature Identification and Status
	USFS CGS Abandoned Mine Land Database	DATE	Date	Photo Final
Datum	BLM AMSCM from DOE Report	DATUM	Datum	
	DOE Abandoned Uranium Mines	Datum	Horizontal Datum of Latitude/Longitude	tbl_Location
Easting	BLM AMSCM Field Inventory Data Sheet	Longitude	Decimal	
	BLM AMSCM from DOE Report	EASTING	UTM Easting	
	CDRMS Field Data Sheet	Longitude		
	CDRMS from DOE Report	LONG_DEG	Degrees of Longitude for mine location	
		LONG_MIN	Minutes of Longitude for mine location	
		LONG_SEC	Seconds of Longitude for mine location	
		EASTING	AML site coordinate reference.	
	DOE Abandoned Uranium Mines	Longitude	Longitude	tbl_Location
	NPS Abandoned Mine Land Database	UTM_E	UTM East	Feature Geographic Description
		Long_ddeg_NAD83	Longitude West	Feature Geographic Description
	USFS CGS Abandoned Mine Land Database	XUTM	USFS xutm code	Samples
		LONG_DD	Longitude in decimal degrees	Samples
		XUTM	USFS xutm code	Water
		XUTM	USFS xutm code	Mine Piles
		XUTM	Opening X (1000 meter grid)	Mine Openings
		XUTM	Inventory X (1000 meter grid)	Inventory Areas
		UTM_X_83	NAD83 X coord	Water
	USGS PP 1651	Longitude	Longitude from scientist's data base and resolved by GIS, in decimal degrees.	Site
		Longitude	Longitude of analysis site from GIS, in decimal degrees.	SpatialAnalysisSites
Elevation	BLM AMSCM from DOE Report	ELEVATION		
	CDRMS Field Data Sheet	Elevation		
	NPS Abandoned Mine Land Database	Elevation	Elevation	Feature Geographic Description
	USFS CGS Abandoned Mine Land Database	ELEV_FT	Elevation of sample location in feet	Samples
		ELEV	Elevation of inventory area	Inventory Areas
	USGS PP 1651	Elevation	Field site elevation from GIS, in feet.	FieldSiteLocMaster
		FieldElevation	Elevation of site, not from GIS, in feet above mean sea level.	Site
		Elevation	Mine site elevation from GIS, in feet.	MineSiteLocMaster
		Elevation	Elevation of analysis site from GIS, in feet; null if outside of study area.	SpatialAnalysisSites
Environmental	BLM AMSCM from DOE Report	PETROCHEMS		
		STOR_DESCR		
		UNDRG_STR		
		LEAKING		
		BARREL_TNK		
		POWER_SUBS		
		STAIN_DESC		
		ASBESTOS		
		ACID_ODOR		
		STAIN_SOIL		
		TRANSFORMS		
	NPS Abandoned Mine Land Database	Contam_Notes	Notes on contamination	Feature Sample and Ranking Data
		Hazsub	Hazardous substances (other than explosives) present?	Feature Hazards
	BLM AMSCM Field Inventory Data Sheet	Feature Type	Minimum of one per site: closed adit/decline/tunnel, closed shaft/incline/stope, etc.	
	BLM AMSCM from DOE Report	DEPTH_OPEN		
		EQUIP_MACH		
		NO_PIT_G30		
		NO_PIT_L30		
		PT_HIGHWAL		
		WASDMP_L01		
		STRUCTURES		
		WASDMP01_5		
		WASDMP_G5		
		TAILS_L_01		
		WASTE_PRES		
		TREST_TRAM		
		NUM_OPENI		
		HEADFRAMES		
		SIZE_OPENI		
		OPENING_TY		
		TAILS_G5		
		NO_HEAPS		
		NO_DREDGE		
		NO_PONDS		
		NO_DAMS		
		NO_MILLS		
		NO_OP_ADIT		
		MILL_TYPE		
		NO_EXPLSV		
		EXPLSV_DES		
		TAILS_01_5		
		OTH_TYPE		
		NO_CL_ADIT		
		DUMPSITES		
		NO_OP_INCL		
		CHEM_PILES		
		NO_CL_INCL		
		NO_OP_SHFT		
		NO_CL_SHFT		

Table C4
Database Field Names by Category

General Category	Database Name	Data Field Name	Description	Database Table Name
		TAILS		
		NO_STOPES		
		NO_OTH_OP		
		WASTE_ROCK		
		NO_OP_DH		
		NO_TRENCH		
		TRENCH_LEN		
		HOMESITES		
		POWERLINES		
		STRUCT_LOK		
		STRUCT_CON		
		STRUCT_TYP		
		NO_PROSP		
		STRUCTURE_		
		OTHER_FEAT		
		SIZE_WASTE		
	CDRMS Field Data Sheet	Depth of Feature		
		Type of Feature		
		Condition		
		Shape of Opening		
		Eroded Dimensions		
		Equipment & Debris/Conditions/Types		
		Mine dump volume and impacts		
		Structures		
	CDRMS from DOE Report	NO_PROSP	Enter the number of prospects found within the mine site. A prospect is an area that has been explored in a preliminary way but has not given evidence of economic value. A prospect is commonly a shallow excavation (equal to or less than 10 feet deep and	
		FEATURE_ID	Identification of each feature within a project area	
		FEATURE_TY	Type of abandoned mine feature	
		NO_OP_ADIT	Enter the number of open adits found within the site. An adit is a horizontal or nearly horizontal passage (0-10 degrees) from the surface into the mine. Examples of an open adit include when the lock on a gated entry is broken when the entry has collaps	
		NO_CL_ADIT	Enter the number of closed adits found within the site. A closed adit is an adit that restricts the general public from entering the mine or that has been reclaimed. A closed adit may be gated blasted shut	
		STRUCTURES	Enter the number of other structures that occur within the site. All abandoned structures except for mills headframes	
		NO_PONDS	Enter the number of ponds found within the site. A pond is a man-made surface depression holding a body of water. A pond can be lined or unlined. They can also contain freshwater pregnant solution	
		NO_DAMS	Enter the number of dams found within the site. A dam is a man-made feature constructed to create a pond for storage of water divert water from a watercourse into a conduit	
		NO_MILLS	Enter the number of mills found within the site. Note location(s) of all mill sites on the sketch map using the symbol for structures on page 6 of the Checklist with an M inside the symbol.	
		MILL_TYPE	Enter the appropriate number(s) for the type of mill or mills found on the mine site. The numbering convention for the types of mills found at the site is given below. If there are multiple mills at the site they are enter sequentially with no spaces nor	
		EQUIP_MACH	Enter the number of locations where mining equipment or machinery has been left or stored on the site. Note location(s) of all mining equipment or machinery on the sketch map using the directions on the lower right side of page 6 of the Checklist.	
		HEADFRAMES	Enter the number of headframes found within the site area. A headframe is a steel or wood frame at the top of a shaft which carries the pulley for the hoist. Note location(s) of headframes on the sketch map using the symbol for structures on page 6 of th	
		NO_DREDGE	Number of locations within the site where dredging was used to extract ore. Two methods of dredging are bucket-line and suction. A bucket-line dredge is a dredge in which the material excavated is lifted by a chain of buckets. The bucket-line dredge oper	
		NO_OP_INCL	Enter the number of open inclines found within the site. An incline is a sloped passage (11-65 degrees) from the surface into the mine.	
		POWERLINES	Enter the number of power lines found within the site. Power lines would be used to bring electrical power to the mining operation. These may be aviation hazards. Note location(s) of the power lines on the sketch map using the appropriate symbol from pag	
		OTHER_TYPE	List the type of other openings counted. This entry is 20 characters long.	
		HOMESITES	Enter the number of structures used as a homesite within the site. A homesite is a structure that is used as living quarters and is currently being occupied. Note the location(s) of all homesites on the sketch map.	
		OTHER_FEAT	Enter feature found on the site which is not described above.	
		TAILS	Tailings are washed or milled ore that is too poor a grade to be treated further. Select from the menu options the appropriate description of the tailings configuration. The options provided are Confined or Unconfined	
		ADIT_WL	Enter the corresponding working level reading for the adit or incline recorded above under ADIT_RAD.	
		SHAFT_WL	Enter the corresponding working level reading for the shaft recorded above under SHAFT_RAD.	
		OTHER_WL	Enter the corresponding working level reading for the other feature recorded above under OTHER_RAD.	
		TREST_TRAM	Enter the number of trestles and tramways found within the site. A trestle is a framework of timber piles	
		NO_TRENCH	Enter the number of trenches that are greater than 3 feet	
		STRUCT_TYP	Describe what the other structures were used for if known.	
		NO_HEAPS	Enter the number of heap leach pads found within the site.	
		NO_CL_INCL	Enter the number of closed inclines found within the site. A closed incline is an incline that restricts the general public from entering the mine or that has been reclaimed. A closed incline may be gated blasted shut	
		NO_OP_SHFT	Enter the number of open shafts within the site. A shaft is a vertical excavation through which a mine is worked (66 to 90 degrees). Examples of an open shaft include when debris bridges the shaft 5 to 10 feet down from the collar and/or the collapsed st	
		NO_CL_SHFT	Enter the number of closed shafts found within the site. A closed shaft is a shaft that restricts the general public from entering the mine or that has been reclaimed. A closed shaft may be grated	
		NO_OTH_OP	Enter the number of other openings found within the mine site. Other openings are glory holes or ventilation holes	
		NO_OP_DH	Enter the number of open drill holes found within the mine site. A drill hole is a circular hole made by drilling. There are many drilling methods. Three common methods are percussion rotary	
Feature		NO_PIT_G30	Enter the number of pits greater than 30 feet deep found within the mine site. A pit is an excavation generally circular in outline with vertical or nearly vertical walls. Note location(s) of all pits greater than 30 feet deep on the sketch map using the	
		NO_PIT_L30	Enter the number of pits equal to or less than 30 feet deep that occur within the mine site. A pit is an excavation generally circular in outline with vertical or nearly vertical walls. On the sketch map	
		PT_HIGHWAL	Enter the total circumference of all pit high walls greater than 10 feet deep	
		WASDMP_L01	Enter the number of waste dumps that are less than 0.1 ac in size within the mine site. A waste dump is the area where barren or low-grade material is discarded. This material is usually dumped just beneath the level of the adit portal or shaft collar. I	
		WASDMP01_5	Enter the number of waste dumps that are 0.1 - 5 ac in size within the mine site. A waste dump is defined above under WASDMP_L01. Include ore stockpiles in this entry. Note location(s) of all waste dumps on the sketch map using the appropriate symbol fro	
		WASDMP_G5	Enter the number of waste dumps that are greater 5 ac in size within the mine site. A waste dump is defined above under WASDMP_01. Include ore stockpiles in this entry. Note location(s) of all waste dumps on the sketch map using the appropriate symbol fr	
		TAILS_L_01	Enter the number of tailings that are less than .1 ac in size within the mine site. Mine tailings are residual materials after the ore-grade materials have been washed concentrated	
		TAILS_01_5	Enter the number of tailings that are greater .1 but less than 5 acres in size within the mine site. Mine tailings are defined above under TAILS_l_01. Note location(s) of all tailings on the sketch map using the appropriate symbol from page 6 of the Chec	
		TAILS_G5	Enter the number of tailings that are greater than 5 acres in	
		NO_STOPES	Enter the number of stopes found within the mine site. A stope is an underground excavation formed by the removal of ore that has opened to the surface. Note location(s) of all stopes on the sketch map using the appropriate symbol from page 6 of the Chec	
	DOE Abandoned Uranium Mines	Comment	Comment	tbl_MineFeatures
		WastePilesVolume	Volume of Waste Pile	tbl_MineFeatures
		Pits	Number or Description of Pits	tbl_MineFeatures
		Adits	Number or Description of Adits	tbl_MineFeatures
		WastePiles	Number or Description of Waste Piles	tbl_MineFeatures
		WastePilesArea	Area of Waste Pile	tbl_MineFeatures
		Shafts	Number or Description of Shafts	tbl_MineFeatures
		OtherDebris	Number or Description of Other Debris	tbl_MineFeatures
		Structures	Number or Description of Structures	tbl_MineFeatures
		Misc	Number or Description of Miscellaneous Features	tbl_MineFeatures
	NPS Abandoned Mine Land Database	Distub_Area_L	Disturbed Area Length (feet)	Feature Dimensions
		Disturb_Area_W	Disturbed Area Width (feet)	Feature Dimensions
		Distub_Area	Area of disturbance around feature (square feet)	Feature Dimensions
		Feature _Notes	Feature Notes	General Feature Identification and Status
		Feature_Depth_Uncertain	Feature Depth Uncertain	Feature Dimensions
		Feature_Depth	Shaft depth / Pit depth / Adit length / Trench depth (feet)	Feature Dimensions
		Feature_Dim_Y	Shaft width 2 / Pit width 2 / Adit height / Trench length (feet)	Feature Dimensions
		Feature_Dim_X	Shaft width 1 / Pit width 1 / Adit width / Trench width (feet)	Feature Dimensions
		Highwall	Highwall present?	Feature Hazards
		Stain	Staining on soils/rocks?	Site Natural Resource Impacts
		Feature_Type	Feature Type	General Feature Identification and Status
		Rockfall	Rockfall hazards present, esp. at entry?	Feature Hazards
		Debris	Debris at this feature?	Feature Hazards
		Est_Waste_Vol	Estimated total volume of waste rock on-site (incl. unshipped ore -cubic yards)	Site Natural Resource Impacts
		Est_Tail_Vol	Estimated total volume of milled tailings on-site (cubic yards)	Site Natural Resource Impacts
	USFS CGS Abandoned Mine Land Database	HIST_STR	Are there any historical structures in the inventory area?	Inventory Areas
		HSTGENCMMT	Historical general comment - general comments about historical structures, etc.	Inventory Areas
		DEPTH	Depth of opening	Mine Openings
		NHOLE	Number of mine featueres in area	Inventory Areas
		LENGTH	Length of the long dimension of the mine dump	Mine Piles
		WIDTH	Width of opening	Mine Openings
		DEPTH_MOD	Depth description modifier (boolean indicator if depth cannot be accurately estimated)	Mine Openings
		NPILE	Number of mine dumps, etc, in area	Inventory Areas
		CONDITION	Condition of the mine opening (e.g. F = filled/collapsed, etc.)	Mine Openings
		COMMENTS	Extended comments describing mine opening	Mine Openings
		HTYPE	Type of mine opening (e.g. A= adit, S = veritical shaft, ST = stope, etc.)	Mine Openings
		MAT_SIZE	Grain size(s) of material in mine dump.	Mine Piles
		FEATURE	Feature name	Photo Final
		HEIGHT	Height of opening	Mine Openings
		WIDTH	Width of the shorter dimension of the mine dump	Mine Piles
		NORMAL_EROD	Types of erosion affecting mine dump during normal precipitation (e.g. R = rills, G = gullies, etc.)	Mine Piles
		CEMENT	Degree of cementation of mine dump materials (e.g. W = well cemented, U = uncemented, etc.)	Mine Piles
		COMMENTS	Extended comments describing the mine dump and other information	Mine Piles

General Category	Database Name	Data Field Name	Description	Database Table Name
		PTYPE	Type of mine dump (e.g. D = mine dump, T = mill tailings, P = processing site, etc.)	Mine Piles
		SLOPE_LNTH	Length of the steepest slope area of mine dump	Mine Piles
		SLOPE_ANG	Steepest slope angle of mine dump material	Mine Piles
		VOLUME	Estimated volume of the mine dump material	Mine Piles
		STABILITY	Estimated stability of the mine dump (e.g. U = unstable, S = stable, etc.)	Mine Piles
	USGS PP 1651	MineSiteType	Type of feature at mine site.	Site
		Shafts	Number of shafts in mine.	Site
		Adits	Number of adits in mine.	Site
		FlowingAdits	Number of flowing adits in mine.	Site
		AditDrainsOverWaste	Whether adit drainage flows over mine waste dump.	Site
		MillMethod	Mill method.	Site
		MillAmalgam	Whether amalgamation process was used at mill.	Site
		MineWasteVolume	Volume of mine waste, in cubic yards.	Site
		DisturbedAreaSize	Size of disturbed area, in square meters.	Site
Geology	CDRMS Field Data Sheet	Surficial Material		
		Depth to Bedrock		
	NPS Abandoned Mine Land Database	Geology_Notes	Notes on geology	Site Geologic Resources
	USGS PP 1651	StratigraphicUnit	Stratigraphic unit abbreviation from overlay with Animas River watershed study GIS GEOLOGY coverage.	FieldSiteLocMaster / MineSiteLocMaster / SpatialAnalysisSites
		Lithology	Rock type from overlay with Animas River watershed study GIS GEOLOGY coverage.	FieldSiteLocMaster / MineSiteLocMaster / SpatialAnalysisSites
		GeologicAge	Geologic age of rock at site from overlay with Animas River watershed study GIS GEOLOGY coverage.	FieldSiteLocMaster / MineSiteLocMaster / SpatialAnalysisSites
		FieldLithology	General description of rock type determined in the field.	Sample
		FieldStratUnit	Stratigraphic unit determined in the field.	Sample
Hazard	BLM AMSCM Field Inventory Data Sheet	Type of Hazard	Physical, environmental, no action needed (P/E/N)	
	BLM AMSCM from DOE Report	SLOPE_INST		
		HAZARD_REC		
		RESCUE_DIF		
		UNSTABL_RX		
	NPS Abandoned Mine Land Database	Subsidence	Areas of subsidence or collapse?	Feature Hazards
		Bad_Air	Bad air present or documented previously?	Feature Hazards
		Explosives	Explosives present?	Feature Hazards
		Fall	Falling hazards due to vertical drop-offs present?	Feature Hazards
		High_Risk	High Risk	General Feature Identification and Status
		Hazards	Hazards in need of mitigation?	Feature Hazards
		Other_Impacts	Other impacts	Site Natural Resource Impacts
		Haz_Notes	Notes on hazards	Feature Hazards
		Impact_Notes	Notes on resource impacts	Site Natural Resource Impacts
		Fire	Evidence of underground fire?	Feature Hazards
Human Use	BLM AMSCM from DOE Report	HUMAN_USE		
		HUMAN_DES		
		RECREATION		
		LAND_DEVEL		
		POPULATED_		
	CDRMS Field Data Sheet	Adjacent land use		
	DOE Abandoned Uranium Mines	DistanceToPopCenter	Distance to Population Center	tbl_Mine_MineGroup
	USFS CGS Abandoned Mine Land Database	DIST_TRAIL	Distance to nearest trail	Inventory Areas
		DIST_CAMP	Distance to nearest campground	Inventory Areas
		DIST_DWELL	Distant to nearest inhabited dwelling	Inventory Areas
		NEAR_TOWN	Nearest town	Inventory Areas
		DIST_OTHER	Distance to other feature	Inventory Areas
		OTHER_DESC	Description of other feature	Inventory Areas
		DIST_TOWN	Distance to nearest town	Inventory Areas
ID	BLM AMSCM from DOE Report	SITE_ID		
		MILS_ID		
		STATEID		
		OID	internal ID field	
		ICF_ID		
	CDRMS Field Data Sheet	ID + MLS No.		
		MLS No		
		AMLIS No		
	CDRMS from DOE Report	FIPSCODE	Federal Information Processing Standards Code	
		OID	internal ID field	
		COUNTYFIPS	Federal Information Processing Standards Code	
		ICF_ID	unique ID	
	DOE Abandoned Uranium Mines	ID	Unique ID	tbl_RadSoil
		DataSourceID	Unique ID	tbl_Cost
		ID	Unique ID	tbl_RadGamma
		DataSourceID	Unique ID	tbl_RadGamma
		EPA_ID	EPA Designated Mine Identification Number	tbl_Mine_MineGroup
		MineID	Unique ID	tbl_RadSoil
		DataSourceID	Unique ID	tbl_RadRadon
		ID	Unique ID	tbl_RadGamma
		MineID	Unique ID	tbl_RadRadon
		ID	Unique ID	tbl_Cost
		MineID	Unique ID	tbl_SurfaceWaterData
		ID	Unique ID	tbl_LandOwner
		DataSourceID	Unique ID	tbl_LandOwner
		AgencyID	Unique ID	tbl_LandOwner
		MineID	Unique ID	tbl_LandOwner
		ID	Unique ID	tbl_LandOwner
		ID	Unique ID	tbl_MineType
		DataSourceID	Unique ID	tbl_MineFeatures
		LM_ID	DOE Legacy Management Designated Identification Number	tbl_Mine_MineGroup
		MineID	Unique ID	tbl_Cost
		ID	Unique ID	tbl_DataSources
		MineTypeID	Unique ID	tbl_Mine_MineGroup
		ID	Unique ID	tbl_Mine_MineGroup
		ID	Unique ID	tbl_VisualCheck
		ID	Unique ID	tbl_Categories
		MineID	Unique ID	tbl_MineCategory
		CategoryID	Unique ID	tbl_MineCategory
		AerialID	Visible on Aerial Photo	tbl_VisualCheck
		MineID	Unique ID	tbl_VisualCheck
		ID	Unique ID	tbl_VisualCheck
		MineID	Unique ID	tbl_Comments
		ID	Unique ID	tbl_Comments
		DataSourceID	Unique ID	tbl_RadRadon
		LocationID	Unique ID	tbl_Location_DataSource
		LocationID	Unique ID	tbl_Mine_MineGroup
		ID	Unique ID	tbl_CoordStatus
		DataSourceID	Unique ID	tbl_MineProduction
		ProdClassID	Unique ID	tbl_MineProduction
		MineID	Unique ID	tbl_MineProduction
		ID	Unique Identification (ID) Number- Part of Database Structure	tbl_Location
		MineID	Unique ID	tbl_OwnerOperator
		DataSourceID	Unique ID	tbl_GroundwaterData
		MineID	Unique ID	tbl_GroundwaterData
		ID	Unique ID	tbl_GroundwaterData
		DataSourceID	Unique ID	tbl_SurfaceWaterData
		ID	Unique ID	tbl_Status
		ID	Unique ID	tbl_SurfaceWaterData
		DataSourceID	Unique ID	tbl_Location_DataSource
		ID	Unique ID	tbl_OwnerOperator
		ID	Unique ID	tbl_Production
		MineID	Unique ID	tbl_MineStatus
		MineStatusID	Unique ID	tbl_MineStatus
		DataSourceID	Unique ID	tbl_MineStatus
		ID	Unique ID	tbl_MineFeatures
		MineID	Unique ID	tbl_MineFeatures
		ID	Unique ID	tbl_MineProduction
	NPS Abandoned Mine Land Database	PMIS	PMIS number	Specific Feature Mitigation Required
		CERCLA	If this is a CERCLA site, give CERCLIS #. Alphanumeric code starting with State Acronym followed by 10 digits (e.g., AK1231231231)	Site - General
		FMSS_FCI	Facility Management Software System Facility Condition Index (0.000 -X.XXX)	Site - General
		FMSS_API	Facility Management Software System Asset Priority Index (1-100)	Site - General
		FMSS_Loc_ID	Facility Management Software System Location ID	Site - General
		Other_ID	Other Identification Code	General Feature Identification and Status
		Legacy_ID	Legacy Identification Code	General Feature Identification and Status
		EDL	Environmental and Disposal Liabilities database number - DOI list that tracks environmentally contaminated sites (formerly ECL" - Environmental Cleanup Liabilities database). Alphanumeric code: Bureau Code ("5" for NPS) + Region Code + Site # (1 to 4-digi	Site - General
		CAMLU_Site_Number	California Parks Only - State AML Unit's unique site identification number	Site - General
		CAMLU_Feature_Number	CAMLU Feature Number	General Feature Identification and Status
		FMSS_Asset_ID	FMSS Asset ID	Specific Feature Mitigation Required
		NPS_ID	Servicewide Identification Code	General Feature Identification and Status
		PEPC	Give PEPC number, or if multiple PEPC numbers were used for various features at this site, list the main one and record others in Site_Notes. PEPC can be used to track NEPA and other compliance requirements, such as NHPA, ESA, wetlands/Section 404 permitt	Site - General
		Park_ID	Park Identification Code	General Feature Identification and Status
	USFS CGS Abandoned Mine Land Database	Unique_ID	UniqueID - concatenated unique key + water identification number (region, state, forest, ranger district, xutm, yutm, areaid)	Water
		Unique_ID	UniqueID - concatenated unique key + pile identification number (region, state, forest, ranger district, xutm, yutm, areaid)	Mine Piles
		UniqueID	UniqueID - concatenated unique key (region, state, forest, ranger district, xutm, yutm, areaid)	Photo Final
		UNIQUE_ID	Concatenated key to link with water hole or pile record	Samples
		PID	Pile Idenfication ID (unique pile id assigned to each mine waste or tailings pile, usually 200 to 299)	Mine Piles
		AREAID	AreaID (Areas within Inventory Areas)	Mine Piles
		AREAID	AreaID (Areas within Inventory Areas)	Water
		SID	Unique water sample id assigned to each water sample	Samples
		OBJECTID	OBJECTID - numeric id	Mine Piles
		Unique_ID	UniqueID - concatenated unique key + hole identification number (region, state, forest, ranger district, xutm, yutm, areaid)	Mine Openings
		OBJECTID	OBJECTID - numeric id	Water
		HID	Hole identification id (unique for every mine opening - 100 thru 199)	Mine Openings
		AREAID	AreaID (Areas within Inventory Areas)	Samples
		AREAID	AreaID (Areas within Inventory Areas)	Mine Openings

General Category	Database Name	Data Field Name	Description	Database Table Name
		OBJECTID	OBJECTID - numeric id	Mine Openings
		OBJECTID	OBJECTID - numeric id	Samples
		UniqueID	UniqueID - concatenated unique key (region, state, forest, ranger district, xutm, yutm, areaid)	Inventory Areas
		OBJECTID_1	OBJECTID - numeric id	Photo Points
		OBJECTID	OBJECTID - numeric id	Inventory Areas
		FEATURE	Feature area number	Photo Points
		Feature_1	Feature ID number	Photo Points
		OBJECTID	OBJECTID - numeric id	Photo Final
		PhotoID	Photo ID number	Photo Final
		Feature_1	Feature ID number	Photo Final
		WID	Unique water id assigned to each water test/sample, values range from 300-399	Water
	USGS PP 1651	SiteNumber	Unique field site identifier, and link to GIS database.	FieldSiteLocMaster
		AMLIMineID	Unique mine site identifier, and link to GIS database.	MineSiteLocMaster
		ParameterCode	Unique 20-character (maximum) code designating a specific result.	Parameter / Result / Qualitative Result
		Ppcode	STORET codes used by Water Resources Discipline.	Parameter
		ProjectCode	Unique 10-character project code.	Project / Site
		QualResultID	Unique value for qualitative result record.	QualitativeResult
		SampleID	Foreign key from Sample table; unique identifier for sample record.	QualitativeResult / Result
		ResultID	Unique value for result record.	Result
		SampleMediaCode	Unique identifier for sample media record.	SampleMedia
		SiteNumber	Unique field site identifier.	Site
		AMLIMineID	Foreign key from MineSiteLocMaster table; unique mine site identifier, and link to GIS database.	Site
		AMLIAnalysisID	Foreign key from SpatialAnalysisSites table; ID (key) assigned to a spatial analysis site.	Site
		PPSiteLabel	ID used to identify this site if different from SiteNumber.	Site
		SegmentID	ID for stream segments.	Site
		AMLIAnalysisID	ID (key) assigned to a spatial analysis site.	SpatialAnalysisSites
Inspection	BLM AMSCM Field Inventory Data Sheet	Inspected by		
	BLM AMSCM Field Inventory Data Sheet	Date of Inspection		
	BLM AMSCM from DOE Report	EVALUATOR	Name of site evaluator	
	NPS Abandoned Mine Land Database	Monit_Date	Monitoring Date (MM/DD/YYYY)	Feature Monitoring
		Monit_Observation	Monitoring Observation	Feature Monitoring
Location Other	BLM AMSCM from DOE Report	TOWNSHIP	A public land surveying unit. An approximately square area about six miles on a side with boundaries conforming to meridians and parallels within established limits. It is subdivided into 36 sections some of which are designed to take up the convergence o	
		MAPLTR		
		ROAD_LOG	Driving directions	
		MERIDIAN	Line extending north and south on the surface of the earth between the two poles and runs along the astronomical meridian. The principal meridian is the line from which the survey township boundaries along the parallels are initiated	
		RANGE	Any series of contiguous townships situated north and south of each other; also sections similarly situated within a township. Ranges of townships are numbered consecutively east and west from a principal meridian: thus "range 3 east" indicates the third	
		SUBDIV		
		GPS_CORREC		
	CDRMS Field Data Sheet	Range		
		Township		
		Section		
		Quarter Section (3)		
		Quarter Section (2)		
		Quarter Section (1)		
	CDRMS from DOE Report	MERIDIAN	Enter the meridian code from ORCA Data Dictionary 1703	
	DOE Abandoned Uranium Mines	NavajoLandLocation	Location Provided from Navajo Nation	tbl_Mine_MineGroup
		Locality	Mining Locality (from original AEC production records)	tbl_Location
		AEC_Location	Location from AEC Production Records	tbl_Mine_MineGroup
		Township	Public Land Survey System - Township	tbl_Location
		NN_ProvidedLocation	Location Provided from Navajo Nation	tbl_Mine_MineGroup
		CoordStatus	Coordinate Status	tbl_CoordStatus
		Range	Public Land Survey System - Range	tbl_Location
		CoordStatusID	Coordinate Status - has the coordinate been verified?	tbl_Location
		Subsection	Public Land Survey System - Subsection (quarter-quarter or lot)	tbl_Location
		Section	Public Land Survey System - Section	tbl_Location
		USGS_TopoID	Visible on USGS Topo	tbl_VisualCheck
	NPS Abandoned Mine Land Database	Quadrant	Quadrant	Feature Geographic Description
		Location_Accuracy	Location Accuracy	Feature Geographic Description
		Section	Section	Feature Geographic Description
		Park_Code	4-character park acronym - e.g., ACAD, DEVA, BISO	Site - General
		Township	Township	Feature Geographic Description
		Region	Region	Site - General
		GPS_Year	GPS Year	Feature Geographic Description
		Range	Range	Feature Geographic Description
		Boundary	Within park boundary?	Feature Geographic Description
		Meridian	Meridian	Feature Geographic Description
		Wilderness	Is feature in designated wilderness	Feature Access
		Aspect	Aspect	Feature Geographic Description
		Published	Where is location published	Feature Access
		Congressional_Dist	often requested in funding proposals - these sometimes change	Site - General
	USFS CGS Abandoned Mine Land Database	RGED	Range direction (from USGS topo 1:24,000 map)	Inventory Areas
		RGE	Range number (from USGS topo 1:24,000 map)	Inventory Areas
		TWPD	Township direction (from USGS topo 1:24,000 map)	Inventory Areas
		TWP	Township number (from USGS topo 1:24,000 map)	Inventory Areas
		SECD	Section number (from USGS topo 1:24,000 map)	Inventory Areas
		REGION	USFS region code	Mine Piles
		TWODEGNAME	Name of USGS 1:250,000 scale base map (TwoDegName)	Inventory Areas
		RGR_DIST	USFS rgr_dst code	Samples
		FOREST	USFS forest code	Samples
		STATE	USFS state code	Samples
		TERRAIN	Type of terrain (e.g. foothills, mesa, hogback, etc.)	Inventory Areas
		QUADDATE	Date of USGS 1:24,000 scale base map (Quad Date)	Inventory Areas
		QQQ	Quarter/Quarter/Quarter section	Inventory Areas
		AREAID	AreaID (Areas within Inventory Areas)	Inventory Areas
		FOREST	USFS forest code	Water
		RGR_DIST	USFS ranger district	Inventory Areas
		FOREST	USFS forest code	Inventory Areas
		REGION	USFS region code	Inventory Areas
		NF	National Forest Name	Photo Points
		REGION	USFS region code	Water
		REGION	USFS region code	Photo Final
		STATE	USFS state code	Photo Final
		FOREST	USFS forest code	Photo Final
		REGION	USFS region code	Samples
		REGION	USFS region code	Mine Openings
		NF	National Forest Name	Photo Final
		STATE	USFS state code	Water
		RGR_DIST	USFS rgr_dst code	Photo Final
		RGR_DIST	USFS ranger district	Mine Openings
		STATE	USFS state code	Mine Openings
		RGR_DIST	USFS rgr_dst code	Water
		Slope	General slope of inventory area (e.g. 0-10, 11-35, >35)	Inventory Areas
		STATE	USFS state code	Mine Piles
		RANGER_DIS	Ranger district name	Samples
		FOREST	USFS forest code	Mine Piles
		RGR_DST	USFS rgr_dst code	Mine Piles
		FOREST	USFS forest code	Mine Openings
	USGS PP 1651	SiteType	General site type, i.e. ground water, surface water, tailings, etc.	Site
		NumofFieldSites	Number of field sites at a specific spacial analysis site.	SpatialAnalysisSites
Mine District	DOE Abandoned Uranium Mines	District	Mining District (from original AEC production records)	tbl_Location
	USFS CGS Abandoned Mine Land Database	MINE_DIST	Mining district name	Inventory Areas
Mine Name	BLM AMSCM from DOE Report	MINE_NAME	Mine name	
	CDRMS Field Data Sheet	Mine Name		
Mine Operator	DOE Abandoned Uranium Mines	Permittee	Site Permittee	tbl_OwnerOperator
		OwnOpSourceID	Owner Information Source	tbl_OwnerOperator
		PermitteeSourceID	Permittee Information Source	tbl_OwnerOperator
		Operator	Site Operator	tbl_OwnerOperator
Mine Type	DOE Abandoned Uranium Mines	Type	Mine Type	tbl_MineType
	NPS Abandoned Mine Land Database	Site_Type	Underground Mine, Surface Mine, Placer Mill, Well, Road, Underground Mine - Mill, Surface Mine - Mill, Underground-Surface Mine, Underground-Surface Mine - Mill, Other	Site - General
Mitigation	BLM AMSCM Field Inventory Data Sheet	Mitigation	Sign, fence, both (S/F/B)	
	BLM AMSCM from DOE Report	HAZ_MITIG		
		MITIG_STAT		
		MIT_FENCED		
		MIT_SIGNS		
		MIT_COND		
		TYPES_OF_E		
		RECOMMENDA	Field notes	
		OTHER_MIT		
	CDRMS Field Data Sheet	Lining		
		Preferred closure method		
		Alternative closure methods		
		Depth to Plug		
		Existing Access Deterrents		
		Work Description		
		Excavated Dimensions		
		Construction Dimensions		
		Access Required?		
	NPS Abandoned Mine Land Database	Compliance_Date	Give date that compliance was completed, and list compliance type (Categorical Exclusion, EA FONSI, or EIS ROD) in Site_Notes.	Site - General
		Nat_Recl	Feature naturally reclaimed?	Specific Feature Mitigation Completed
		Mitig_Used	Mitigation technique used	Specific Feature Mitigation Completed
		NatRes_Impacts	Resource impacts in need of mitigation?	Site Natural Resource Impacts
		Partners	What partners were used?	Specific Feature Mitigation Completed
		Mitig_Compl_Notes	Notes on completed mitigation	Specific Feature Mitigation Completed
		Mitig_by	Who mitigated the feature?	Specific Feature Mitigation Completed
		Temp_Safe_Used	Temporary safing method used	Specific Feature Mitigation Completed
		Mitig_Opt2	Mitigation Option 2	Specific Feature Mitigation Required
		Mitig_Opt1	Mitigation Option 1	Specific Feature Mitigation Required
		Temp_Safe	Temporary safing method required	Specific Feature Mitigation Required
		Mitig_Req_Notes	Notes on mitigation required	Specific Feature Mitigation Required
	USFS CGS Abandoned Mine Land Database	DETER_C	Condition of access deterrent installed at mine dump	Mine Piles

General Category	Database Name	Data Field Name	Description	Database Table Name
		DETER_T	Type of access deterrent installed at mine dump (e.g. F = fence, G = open grill, etc.)	Mine Piles
		ACRES	Number of acres reclaimed	Inventory Areas
		DETER_C	Condition of access deterrent installed at mine opening (e.g. P = prevents access, etc.)	Mine Openings
		DETER_T	Type of access deterrent installed at mine opening (e.g. S = sign, C = capped/sealed, etc.)	Mine Openings
		RECLAIMED	Has any reclamation been performed in the area?	Inventory Areas
Northing	BLM AMSCM Field Inventory Data Sheet	Latitude	Decimal	
	BLM AMSCM from DOE Report	NORTHING	UTM Northing	
	CDRMS Field Data Sheet	Latitude		
	CDRMS from DOE Report	LAT_DEG	Degrees of Latitude for mine location	
		LAT_SEC	Seconds of Latitude for mine location	
		LAT_MIN	Minutes of Latitude for mine location	
		NORTHING	AML site coordinate reference.	
	DOE Abandoned Uranium Mines	Latitude	Latitude	tbl_Location
	NPS Abandoned Mine Land Database	Lat_ddeg_NAD83	Latitude North	Feature Geographic Description
		UTM_N	UTM North	Feature Geographic Description
	USFS CGS Abandoned Mine Land Database	YUTM	USFS yutm code	Mine Piles
		YUTM	Inventory Y (1000 meter grid)	Inventory Areas
		YUTM	USFS yutm code	Samples
		YUTM	Opening Y (1000 meter grid)	Mine Openings
		LAT_DD	Latitude in decimal degrees	Samples
		YUTM	USFS yutm code	Water
		UTM_Y_83	NAD83 Y coord	Water
	USGS PP 1651	Latitude	Latitude from scientist's data base and resolved by GIS, in decimal degrees.	Site
		Latitude	Latitude of analysis site from GIS, in decimal degrees.	SpatialAnalysisSites
Ownership	BLM AMSCM Field Inventory Data Sheet	Ownership	Municipal, mixed, private, split estate, state, USFS, BLM, Unknown, Other	
	BLM AMSCM from DOE Report	MIN_OWN		
		SURF_OWN		
	CDRMS Field Data Sheet	Owner		
	CDRMS from DOE Report	LAND_OWNER	Name of land owner	
	DOE Abandoned Uranium Mines	ContactName	Land Owner Contact	tbl_LandOwner...
		Feature1_ID	Land Owner Feature 1	tbl_LandOwner
		Comment	Comment	tbl_LandOwner
		Owner	Site Owner	tbl_OwnerOperator
		Name2	Land Owner Name 2	tbl_LandOwner
		Name1	Land Owner Name 1	tbl_LandOwner
		MineralOwner	Mineral Rights Owner	tbl_LandOwner
		Feature2_ID	Land Owner Feature 2	tbl_LandOwner
	NPS Abandoned Mine Land Database	Ownership	Legal ownership: Federal, Private (including patented mining claims), Unpatented (unpatented mining claim), State, County, Other , Unknown	Site - General
Photograph	BLM AMSCM Field Inventory Data Sheet	Photograph		
		Photograph Notes		
	BLM AMSCM from DOE Report	NUM_PHOTOS	Number of photos	
	CDRMS Field Data Sheet	Photos		
	USFS CGS Abandoned Mine Land Database	NOTE_	Notes on picture	Photo Points
		DATE_	Date photo taken	Photo Points
		FRAME	Frame number	Photo Points
		PhotoID	PhotoID number	Photo Points
		ROLL	Roll name	Photo Final
		FRAME	Frame number(s) of mine opening photographs	Mine Openings
		ROLL	Film roll identifier used to photograph mine opening	Mine Openings
		ROLL	Film roll	Photo Points
		Photo_ID	Photo identification number	Mine Piles
		FRAME	Frame number	Photo Final
		NOTE_	Photo notes	Photo Final
		ROLL	Film roll identifier used to photograph mine dump	Mine Piles
		FRAME	Frame number(s) of mine dump photos	Mine Piles
		SITE	Site name	Photo Final
		SITE	Site name	Photo Points
Production	DOE Abandoned Uranium Mines	TonsOre	Tone of Ore Produced	tbl_MineProduction
		LastProdYear	Last Year of Production	tbl_MineProduction
		ProdDescription	Description of Production Size of Mine (e.g., small, small/medium)	tbl_Production
		Comment	Comment	tbl_MineProduction
		GradePct	Percent Grade	tbl_MineProduction
		ProdClass	Range of Class/Size Mine (e.g., [small] 0-100 tons, [small/medium] 100-1000 tons,..)	tbl_Production
		PoundsU3O8	Pounds of Uranium Oxide Produced	tbl_MineProduction
		FirstProdYear	First Year of Production	tbl_MineProduction
	USGS PP 1651	MillBuiltDate	Date mill or smelter was built or re-modeled.	Site
		MillProduction	Mill production, in tons per day.	Site
Project Manager or Contact	CDRMS Field Data Sheet	Project Mgr.		
	CDRMS from DOE Report	ADDEDBY		
		ADDEDBY	User name or process by which the record was added to the database.	
	USFS CGS Abandoned Mine Land Database	RECORDER	Recorder - name of field person and date	Inventory Areas
	USGS PP 1651	ProjectChief	Person in charge of project.	Project
		ProjectDataPerson	Data contact person for project.	Project
		ScientistPhone	Phone number of project chief.	Project
		ScientistEmail	E-mail address of project chief.	Project
Project Name	CDRMS Field Data Sheet	Project		
	CDRMS from DOE Report	PROJECT_NA	Name of project area that is being inventoried	
	USGS PP 1651	ProjectName	Name of project.	Project
Property Size	BLM AMSCM Field Inventory Data Sheet	Acres		
	CDRMS from DOE Report	SITE_ACRES	Enter cumulative or total acres of surface disturbance rounded to the nearest tenth excluding the access acreage. Acreage is calculated by multiplying the length by the width of the disturbance due to mining and then dividing by 43560.	
	DOE Abandoned Uranium Mines	MineArea	Mine Area (e.g., acres, square feet, etc.)	tbl_Mine_MineGroup
	NPS Abandoned Mine Land Database	Site_Acres	Measure or estimate size of surface disturbance for entire site (tenths of acres used for smaller sites)	Site - General
	USFS CGS Abandoned Mine Land Database	AREA	Outer boundary of the inventory area	Inventory Areas
Quad	BLM AMSCM from DOE Report	USGS_QUAD_	Vertical distance from a datum usually mean sea level	
	CDRMS Field Data Sheet	Quad Name		
	NPS Abandoned Mine Land Database	Quad	Quadrangle Name	Feature Geographic Description
	USFS CGS Abandoned Mine Land Database	QUADNAME	Name of USGS 1:24,000 scale base map (Quad Name)	Inventory Areas
Ranking	BLM AMSCM from DOE Report	SCORE_TOTA		
		SIGNIFICAN		
	NPS Abandoned Mine Land Database	Access_Rating	Difficulty of access	Feature Sample and Ranking Data
		Resource_Rating	Importance of resource	Feature Sample and Ranking Data
		Impact_Rating	Severity of resource impacts	Feature Sample and Ranking Data
		Hazard_Rating	Danger associated with hazards	Feature Sample and Ranking Data
		Workings_Extensive	Are underground workings extensive (> 500' or multilevel)?	Feature Sample and Ranking Data
	USFS CGS Abandoned Mine Land Database	HAZ_RATING	Rating of physical hazard posed to human life by activities/structures related to construction/development of mine dump	Mine Piles
		STORM_EROD	Erosional susceptibility of the dump site during to storm events (e.g. C = in contact with normal stream, etc.)	Mine Piles
		PHYSICAL_HAZARD	Physical hazard rating	Inventory Areas
		ENVIRO_HAZARD	Environmental hazard rating	Inventory Areas
		HAZ_RATING	Rating of physical hazard posed to human life by mine opening	Mine Openings
		ENV_RATING	Rating of environmental degradation attributable to mine opening/activities	Mine Openings
		ENV_RATING	Rating of environmental degradation attributable to mine dump	Mine Piles
Reference	DOE Abandoned Uranium Mines	Name	Data Source Name (e.g., name of a report or map)	tbl_DataSources
		Type	Data Source Type	tbl_DataSources
		Originator	Originator of Data Source	tbl_DataSources
		SharepointLink	SharePoint Link	tbl_DataSources
		Description	Description of Data Source	tbl_DataSources
		Comments	Comment	tbl_DataSources
		FileName	Data Source File Name	tbl_DataSources
		FilePath	Data Source File Path (where is it being electronically stored)	tbl_DataSources
	NPS Abandoned Mine Land Database	Source		General Feature Identification and Status
	USGS PP 1651	PublicationNumber	Publication number for project publication.	Project
		PublicationName	Publication name for project publication.	Project
		CDMGReference	Colorado Division of Minerals and Geology publication reference.	Site
Sample	CDRMS from DOE Report	NO_SAMPLES	Enter the number of water samples taken for analysis.	
		DATE	The data logger will automatically generate the date the information is collected in the field.	
	NPS Abandoned Mine Land Database	Soil_Samp	Soils / tailings / waste rock sampled?	Feature Sample and Ranking Data
		Water_Samp	Was water sampled?	Feature Sample and Ranking Data
	USFS CGS Abandoned Mine Land Database	AGENCY	Entity for which sample was performed	Samples
		SITE_DESCR	Site description of the sample site	Samples
		SITE_ALIAS	A secondary or alternative description of the sample site	Samples
		SAMPLED_DA	Date water sample was collected (mm/dd/yyyy).	Samples
		TIME_24HR	Time of day water sample was collected (military time - ##:##)	Samples
		COMMENT	Description of the physical sample location, type of sample, and any factors that may affect the analysis results	Samples
		TYPE	Type of water source from which the water sample was taken (e.g. adit, shaft, portal, leachate, dump seep, stream, lake, etc.)	Samples
		LABORATORY	Name of lab (e.g. CDPHE/ICL, USGSBGC, etc.)	Samples
		SAMPLER	Entity performing the sampling (e.g. CGS, CDH, etc.)	Samples
		LAB_RECEIV	Date the laboratory received the water sample (mm/dd/yyyy)	Samples
		COMMENTS	Extended comments describing the water test and other information	Water
	USGS PP 1651	AnalyticMethodShortName	Short name of analytic method.	AnalyticMethod
		AnalyticMethodName	Full name of analytic method.	AnalyticMethod
		LabShortName	Short Name of lab performing analysis.	LabName
		LabName	Long name of lab performing analysis.	LabName
		PoreSize	Filter/pore size for separated samples.	Parameter
		AnalyticalMethodShortName	Foreign key from Analytic Method table; short name of analytic method.	Result
		LabShortName	Foreign key from LabName table; short name of lab performing analysis.	Result
		FilterPoreSize	Description of filter size.	Result
		AnalyticMethodShortName	Foreign key from AnalyticMethod table; short name of analytic method.	Sample
		LabShortName	Foreign key from LabName table; short name of lab performing analysis.	Sample
		FilterPoreSize	Description of filter size.	Sample
		ValueComments	Miscellaneous comments about result.	Sample
		SampleDate	Day sample was taken, in mmddyyyy.	Sample
		SampleTime	Time sample was taken, in military time.	Sample
		SampleMediaCode	Foreign key from SampleMedia table; unique identifier for sample media record.	Sample
		SampleDepth	Depth to sample, in SI units.	Sample
		CollectionMethod	Method used to collect sample.	Sample
		SamplePreparation	General description of sample preparation procedures.	Sample
		SampleComment	Additional comments about sample.	Sample
		SampleCollector	Collector of sample.	Sample
		MediaType	General media category; i.e., rock.	SampleMedia
		Sub-type	More specific media sub-category; i.e., igneous.	SampleMedia

Table C4
Database Field Names by Category

General Category	Database Name	Data Field Name	Description	Database Table Name
	CDRMS from DOE Report	BACKG_RAD	Background is the overall reading of the ore host rock formation of the area being investigated. Enter the background gamma reading in milli-roentgen per hour.	
		ADIT_RAD	Enter the highest gamma reading taken for all the adits and inclines within the site.	
		SHAFT_RAD	Enter the highest gamma reading taken for all the shafts for all the shafts within the mine site.	
		OTHER_RAD	Enter the highest gamma reading taken for all the other features found within the mine site.	
	DOE Abandoned Uranium Mines	Comment	Comment	tbl_RadSoil
		Comment	Comment	tbl_RadGamma
		RadonAvg	Average Radon Measurement	tbl_RadRadon
		GammaUnits	Measurement Units	tbl_RadGamma
		RadiumRange	Measurement Range	tbl_RadSoil
		GammaAvgBackground	Gamma Range Background	tbl_RadGamma
		GammaRangeBackground	Gamma Range Background	tbl_RadGamma
		RadiumUnits	Measurement Units	tbl_RadSoil
		RadonRange	Radon Measurement Range	tbl_RadRadon
		RadiumAvg	Average Radium-226 in Soil	tbl_RadSoil
		GammaAvg	Average Gamma Measurement	tbl_RadGamma
		RadonBackground	Background Measurement	tbl_RadRadon
		GammaRangeWastePiles	Gamma Range for Waste Piles	tbl_RadGamma
		RadonUnits	Measurement Units	tbl_RadRadon
		GammaRangeComment	Comment	tbl_RadGamma
		Comment	Comment	tbl_RadRadon
		GammaMax	Maximum Gamma Measurement	tbl_RadGamma
		RadiumBackground	Background Measurement	tbl_RadSoil
	NPS Abandoned Mine Land Database	Soil_Contam	Elevated contaminant levels in the soil?	Feature Sample and Ranking Data
		pH_bg	Background pH (to nearest tenth)	Feature Sample and Ranking Data
		pH_Effl	pH of effluent (to nearest tenth)	Feature Sample and Ranking Data
		Water_Contam	Elevated contaminant levels in the water?	Feature Sample and Ranking Data
	USFS CGS Abandoned Mine Land Database	MAX_RADS	Maximum radiation measurement	Inventory Areas
		RADS	Radiation counts measured at or near mine opening	Mine Openings
		RADS	Radiation counts measured at or near mine dump	Mine Piles
		CL_MG	Laboratory measured dissoved chlorine (mg/L)	Samples
		CONDUCT	Specific conductance of the water (mS/cm)	Water
		PH	pH value of the water measured in the field	Water
		RAD_UNITS	Radiation measurement units	Mine Piles
		TL_TOT	Lab measured total recoverable thallium (ug/L)	Samples
		SN_DIS	Lab Measured Dissolved Tin (ug/L) - field filtered with 0.45 micron filter	Samples
		MOD_SN_DIS	Modifier for analyte ("-" below instrument sensitivity, etc.)	Samples
		SR_TOT	Lab measured total recoverable strontium (ug/L)	Samples
		MOD_SR_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		SR_DIS	Lab Measured Dissolved Strontium (ug/L) - field filtered with 0.45 micron filter	Samples
		MOD_SR_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		TH_TOT	Lab measured total recoveable thorium (ug/L)	Samples
		MOD_TH_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		TH_DIS	Lab Measured Dissolved Thorium (ug/L) - field filtered with 0.45 micron filter	Samples
		MOD_TH_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		TI_TOT	Lab measured total recoverable titanium (ug/L)	Samples
		MOD_HG_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		TI_DIS	Lab Measured Dissolved Titanium (ug/L) - field filtered with 0.45 micron filter	Samples
		MOD_SE_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		NA_DIS_MG	Laboratory measured dissolved sodium (mg/L)	Samples
		MOD_TL_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		TL_DIS	Lab Measured Dissolved Thallium (ug/L) - field filtered with 0.45 micron filter	Samples
		MOD_TL_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		U_DIS	Lab Measured Dissolved Uranium (ug/L) - field filtered with 0.45 micron filter	Samples
		U_DIS_PCI_	Lab measured dissolved Uranium (pC/L) - field filtered with 0.45 micron fileter	Samples
		MOD_U_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		U_TOT	Lab measured total recoverable uranium (ug/L)	Samples
		MOD_U_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		V_TOT	Lab measured total recoverable vanadium (ug/L)	Samples
		MOD_V_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		MOD_TI_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		MOD_MN_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		HG_DIS	Lab Measured Dissolved Mercury (ug/L) - field filtered with 0.45 micron filter.	Samples
		MOD_HG_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		LI_TOT	Lab measured total recoverable lithium (ug/L).	Samples
		MOD_LI_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		LI_DIS	Lab Measured Dissolved Lithium (ug/L) - field filtered with 0.45 micron filter.	Samples
		MOD_LI_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		MO_TOT	Lab measured total recoverable molybdenum (ug/L).	Samples
		MOD_MO_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		MO_DIS	Lab Measured Dissolved Molybdenum (ug/L) - field filtered with 0.45 micron filter.	Samples
		MOD_MO_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		MN_TOT	Lab measured total recoverable manganese (ug/L).	Samples
		MOD_SN_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		MN_DIS	Lab Measured Dissolved Manganese (ug/L) - field filtered with 0.45 micron filter.	Samples
		SN_TOT	Lab measured total recoverable tin (ug/L)	Samples
		NI_TOT	Lab measured total recoverable nickel (ug/L).	Samples
		MOD_NI_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		NI_DIS	Lab Measured Dissolved Nickel (ug/L) - field filtered with 0.45 micron filter.	Samples
		MOD_NI_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		PB_TOT	Lab measured total recoverable lead (ug/L).	Samples
		MOD_PB_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		PB_DIS	Lab Measured Dissolved Lead (ug/L) - field filtered with 0.45 micron filter.	Samples
		MOD_PB_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		SE_TOT	Lab measured total recoverable selenium (ug/L).	Samples
		MOD_SE_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		SE_DIS	Lab Measured Dissolved Selenium (ug/L) - field filtered with 0.45 micron filter	Samples
		ZN_TOT	Lab measured total recoverable zinc (ug/L)	Samples
		MOD_MN_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		MOD_NO3	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		V_DIS	Lab Measured Dissolved Vanadium (ug/L) - field filtered with 0.45 micron filter	Samples
		MOD_BR_MG	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		HCO3_MG	Laboratory measured dissolved bicarbonate (mg/L)	Samples
		MOD_HCO3	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		CO3_MG	Laboratory measured dissolved carbonate (mg/L)	Samples
		MOD_CO3	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		OH_MG	Laboratory measured dissolved hydroxide (mg/L)	Samples
		MOD_OH	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		NH3_MG	Laboratory measured dissolved ammonia (mg/L)	Samples
		MOD_NH3_MG	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		NO2_MG	Laboratory measured dissolved nitrite (mg/L)	Samples
		MOD_F	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		NO3_MG	Laboratory measured dissolved nitrate (mg/L)	Samples
		F_MG	Laboratory measured dissoved fluorine (mg/L)	Samples
		NO2_NO3_MG	Lab measured dissolved nitrate + nitritge (mg/L)	Samples
		MOD_NO2_NO	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		K_TOT_MG	Laboratory measured total recoverable potassium (mg/L)	Samples
		MOD_K_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		K_DIS_MG	Laboratory measured dissolved potassium (mg/L)	Samples
		MOD_K_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		SO4_MG	Laboratory measured dissolved sulfate (mg/L)	Samples
		MOD_SO4	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		BI_TOT	Laboratory measured total recoverable bismuth (ug/L)	Samples
		MOD_BI_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		BI_DIS	Laboratory measured dissolved bismuth (ug/L)	Samples
		MOD_BI_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		MOD_NO2	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		MOD_T_PHOS	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		MOD_TI_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		MOD_ZN_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
Sample Results		ZN_DIS	Lab Measured Dissolved Zinc (ug/L) - field filtered with 0.45 micron filter	Samples
		MOD_ZN_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		ZR_TOT	Lab measured total reoverable zirconium (ug/L)	Samples
		MOD_ZR_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		ZR_DIS	Lab Measured Dissolved Zirconium (ug/L) - field filtered with 0.45 micron filter	Samples
		MOD_ZR_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		TSS_MG	Lab measured total suspended solids (mg/L)	Samples
		MOD_TSS	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		TDS_MG	Lab measured total dissolved solids (mg/L)	Samples
		BR_MG	Laboratory measured dissolved bromine (mg/L)	Samples
		T_PHOS_MG	Lab measured total recoverable phosphorus (mg/L)	Samples
		MOD_V_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		P_DIS_MG	Lab measured dissolved phosporous (mg/L)	Samples
		MOD_P_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		PO4_DIS_MG	Laboratory measured dissolved phosphate (mg/L)	Samples
		MOD_PO4_DI	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		SI_TOT_MG	Laboratory measured total recoverable silicon (mg/L)	Samples
		MOD_SI_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		SI_DIS_MG	Laboratory measured dissoved silicon (mg/L)	Samples
		MOD_SI_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		NA_TOT_MG	Laboratory measured total recoverable sodium (mg/L)	Samples
		MOD_NA_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		MOD_NA_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		MOD_CL	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		MOD_TDS	Modifier for analyte ("-" - below instrument sensitivity, etc.)	Samples
		B_TOT	Lab Measured total recoverable boron (ug/L).	Samples
		MOD_AL_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		AG_TOT	Lab Measured total recoverable silver (ug/L).	Samples
		MOD_AG_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		AG_DIS	Lab Measured Dissolved Silver (ug/L) - field filtered with 0.45 micron filter.	Samples
		MOD_AG_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		AS_TOT	Lab Measured total recoverable Arsenic (ug/L).	Samples
		MOD_AS_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		AS_DIS	Lab Measured Dissolved Arsenic (ug/L) - field filtered with 0.45 micron filter.	Samples
		MOD_AS_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		MOD_BA_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		MOD_AU_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		MOD_MG_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		MOD_B_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples

General Category	Database Name	Data Field Name	Description	Database Table Name
		B_DIS	Lab Measured Dissolved Boron (ug/L) - field filtered with 0.45 micron filter.	Samples
		MOD_B_DIS	Modifier for analyte ("-" below instrument sensitivity, etc.).	Samples
		BR	Lab measured dissolved bromine (mg/L).	Samples
		MOD_BR	Modifier for analyte ("-" below instrument sensitivity, etc.).	Samples
		SB_TOT	Lab Measured total recoverable Antimony (ug/L).	Samples
		MOD_SB_TOT	Modifier for analyte ("-" below instrument sensitivity, etc.).	Samples
		SB_DIS	Lab Measured Dissolved Antimony (ug/L) - field filtered with 0.45 micron filter.	Samples
		MOD_SB_DIS	Modifier for analyte ("-" below instrument sensitivity, etc.).	Samples
		BA_TOT	Lab Measured total recoverable barium (ug/L).	Samples
		AU_DIS	Lab Measured Dissolved Gold (ug/L) - field filtered with 0.45 micron filter.	Samples
		LAB_ALK_MG	Lab measured alkalinity (mg/L).	Samples
		FIELD_PH	pH measured in the field.	Samples
		LAB_PH	pH measured in the lab.	Samples
		TEMP_C	Temp of sample measured in the field (degrees C).	Samples
		FIELD_COND	Field specific conductance (mS/cm).	Samples
		MOD_COND	Conductivity modifier (only value is "-" or below instrument sensitivity.	Samples
		LAB_COND	Lab specific conductance (mS/cm).	Samples
		DIS_OXY_MG	Field measured dissolved oxygen (mg/L).	Samples
		MOD_DIS_OX	Modifer for field measured dissolved oxygen ("-" = below instrument sensitivity, etc.).	Samples
		HARD_MG	Lab hardness (mg/L CaCO3 equivalent).	Samples
		MOD_HARD	Modifier for lab hardness ("-" = below instrument sensitivity, etc.).	Samples
		AL_DIS	Lab Measured Dissolved Aluminum (ug/L) - field filtered with 0.45 micron filter.	Samples
		FIELD_MOD_	Modifier for field alkalinity ("-" = below instrument sensitivity, etc.).	Samples
		MOD_AL_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		HG_TOT	Lab measured total recoverable mercury (ug/L).	Samples
		LAB_MOD_AL	Modifer for lab alkalinity ("-" = below instrument sensitivity, etc.).	Samples
		ACIDITY	Lab measured acidity (mg/L).	Samples
		CA_TOT_MG	Lab Measured Total Recoverable Calcium (mg/L).	Samples
		MOD_CA_TOT	Modifier for Total Recoverable Calcium ("-" = below instrument sensitivity, etc.).	Samples
		CA_DIS_MG	Lab Measured Dissolved Calcium (mg/L) - field filtered with 0.45 micron filter.	Samples
		MOD_CA_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		MG_TOT_MG	Lab Measured Total Recoverable Magnesium (mg/L).	Samples
		MOD_MG_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		AL_TOT	Lab Measured Total Recoverable Aluminum (ug/L).	Samples
		FIELD_ALK_	Field alkalinity (mg/L).	Samples
		MOD_CN_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		CD_TOT	Lab measured total recoverable cadmium (ug/L).	Samples
		MOD_CD_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		CD_DIS	Lab Measured Dissolved Cadmium (ug/L) - field filtered with 0.45 micron filter.	Samples
		MOD_CD_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		CU_TOT	Lab measured total recoverable copper (ug/L).	Samples
		MOD_CU_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		CU_DIS	Lab Measured Dissolved Copper (ug/L) - field filtered with 0.45 micron filter.	Samples
		MOD_CU_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		CR_TOT	Lab measured total recoverable chromium (ug/L).	Samples
		MOD_CR_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		CR_DIS	Lab Measured Dissolved Chromium (ug/L) - field filtered with 0.45 micron filter.	Samples
		MOD_CO_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		CN_TOT_MG	Lab measured total recoverable cyanide (mg/L).	Samples
		MOD_FE_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		FE_TOT	Lab measured total recoverable iron (ug/L).	Samples
		MOD_FE_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		FE_DIS	Lab Measured Dissolved Iron (ug/L) - field filtered with 0.45 micron filter.	Samples
		GA_TOT	Lab measured total recoverable gallium (ug/L).	Samples
		MG_DIS_MG	Lab Measured Dissolved Magnesium (mg/L) - field filtered with 0.45 micron filter.	Samples
		MOD_GA_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		GA_DIS	Lab Measured Dissolved Gallium (ug/L) - field filtered with 0.45 micron filter.	Samples
		MOD_GA_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		GE_TOT	Lab measured total recoverable germanium (ug/L).	Samples
		MOD_GE_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		GE_DIS	Lab Measured Dissolved Germanium (ug/L) - field filtered with 0.45 micron filter.	Samples
		MOD_GE_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		MOD_CR_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		CO_DIS	Lab measured dissolved cobalt (ug/L).	Samples
		BA_DIS	Lab Measured Dissolved Barium (ug/L) - field filtered with 0.45 micron filter.	Samples
		MOD_BA_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		BE_TOT	Lab Measured total recoverable Beryllium (ug/L).	Samples
		MOD_BE_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		MOD_CO_TOT	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
		CO_TOT	Lab measured total recoverab le cobalt (ug/L).	Samples
		BE_DIS	Lab Measured Dissolved Beryllium (ug/L) - field filtered with 0.45 micron filter.	Samples
		MOD_BE_DIS	Modifier for analyte ("-" - below instrument sensitivity, etc.).	Samples
	USGS PP 1651	ParameterName	255-character field describing specific result.	Parameter
		ConstituentName	Element name or similar chemical group.	Parameter
		ReportUnits	Units of measurement.	Parameter
		Value	Numeric result.	Result
		ValueRemarkCode	Modifier for result; <: less than lower detection limit, >: greater than upper detection limit, E: estimated result, Q: lower detection limit halved.	Result
Site Name	BLM AMSCM Field Inventory Data Sheet	Site Name		
	NPS Abandoned Mine Land Database	Site_Name	The official name, or if not known, an identifying name (e.g., Unknown 1 Grizzly Gulch 1 etc.).	Site - General
	USFS CGS Abandoned Mine Land Database	SITENAME_1	Site Name 1 (First Alias)	Inventory Areas
	USGS PP 1651	SiteName	Text name such as 'Boulder Creek at mouth'.	Site
		SiteNumber1	Name of field site at a specific spatial analysis site, or first field site if there are more than one.	SpatialAnalysisSites
		SiteNumber2	Name of second field site at a specific spatial analysis site, if applicable.	SpatialAnalysisSites
		SiteNumber3	Name of third field site at a specific spatial analysis site, if applicable.	SpatialAnalysisSites
		SiteNumber4	Name of fourth field site at a specific spatial analysis site, if applicable.	SpatialAnalysisSites
		SiteNumber5	Name of fifth field site at a specific spatial analysis site, if applicable.	SpatialAnalysisSites
		SiteNumber6	Name of sixth field site at a specific spatial analysis site, if applicable.	SpatialAnalysisSites
		SiteNumber7	Name of seventh field site at a specific spatial analysis site, if applicable.	SpatialAnalysisSites
		SiteNumber8	Name of eighth field site at a specific spatial analysis site, if applicable.	SpatialAnalysisSites
		SiteNumber9	Name of ninth field site at a specific spatial analysis site, if applicable.	SpatialAnalysisSites
		SiteNumber10	Name of tenth field site at a specific spatial analysis site, if applicable.	SpatialAnalysisSites
		SiteNumber11	Name of eleventh field site at a specific spatial analysis site, if applicable.	SpatialAnalysisSites
State	BLM AMSCM from DOE Report	GEO_STATE	State abbreviation	
		STATE_ID	State location code	
	CDRMS from DOE Report	STATE_ID	Enter the State of Utah Abandoned Mine Reclamation number for the site. This field is 11 characters in length.	
	DOE Abandoned Uranium Mines	State	State Name	tbl_Location
	NPS Abandoned Mine Land Database	State	2-letter postal code (if site crosses state line, pick primary and list other in Site_Notes)	Site - General
	USFS CGS Abandoned Mine Land Database	STATE	USFS state code	Inventory Areas
Status	BLM AMSCM from DOE Report	STATUS		
	DOE Abandoned Uranium Mines	ActionReq	Action Required?	tbl_Comments
		ActionCompleted	Date Action Was Completed	tbl_Comments
		ActionDesc	Description of Action	tbl_Comments
		VisualCheckDesc	Description of Visual Check	tbl_VisualCheck
		ActionDesc	Description of Action Required	tbl_VisualCheck
		ActionCompleted	Date Action Was Completed	tbl_VisualCheck
		ActionReq	Action Required?	tbl_VisualCheck
		Status	Mine Status	tbl_Status
		StatusDesc	Mine Status Description	tbl_Status
		OriginalStatus	Status from Original Data Source	tbl_MineStatus
		Comment	Comment	tbl_VisualCheck
		CheckedDate	Date Checked	tbl_VisualCheck
		Comment	Comment	tbl_MineStatus
		CheckedBy	Checked By	tbl_VisualCheck
	NPS Abandoned Mine Land Database	Mitig_Date	Date feature was reclaimed/mitigated (MM/DD/YYYY)	Specific Feature Mitigation Completed
		Action_Required	Action Required	General Feature Identification and Status
		Temp_Safe_Date	Date of temporary closure (MM/DD/YYYY)	Specific Feature Mitigation Completed
Unknown	BLM AMSCM from DOE Report	DIST_RA		
		GROUND_STA		
		OTHER		
		FIELD_ACTI		
		GPS_HEIGHT		
		MINACT_DES		
		METHOD_PRE		
		REC_MINACT		
		FILT_POS		
		RCVR_TYPE		
		MAX_PDOP		
		STD_DEV		
	DOE Abandoned Uranium Mines	Category		tbl_Categories
		IsDeleted		tbl_Mine_MineGroup
UTM Zone	BLM AMSCM Field Inventory Data Sheet	UTM Zone		
		UTM Zone Easting	7 numeric	
		UTM Zone Northing	7 numeric	
	BLM AMSCM from DOE Report	UTM_ZONE	UTM Zone	
	CDRMS Field Data Sheet	UTM Zone		
	CDRMS from DOE Report	UTM_ZONE	UTM zone number.	
	NPS Abandoned Mine Land Database	UTM_Zone	UTM Zone	Feature Geographic Description
	USFS CGS Abandoned Mine Land Database	UTM_ZONE	USFS utm_zone code	Photo Final
		UTM_ZONE	USFS utm_zone code	Water
		UTM_ZONE	UTM zone	Mine Openings
		UTM_ZONE	USFS utm_zone code	Mine Piles
		UTM_ZONE	UTM zone	Inventory Areas
		UTM_ZONE	USFS utm_zone code	Samples
	USGS PP 1651	UTM_Easting	UTM Easting Coordinate of site from GIS, in Zone 13, NAD27, in meters.	SpatialAnalysisSites
		UTM_Northing	UTM Northing Coordinate of site from GIS, in Zone 13, NAD27, in meters.	SpatialAnalysisSites
Vegetation	BLM AMSCM from DOE Report	VEG_COND		
		REVEG_EVID		
		REVEG_DESC		
	NPS Abandoned Mine Land Database	Vegetation	Characterize vegetation on the disturbed area	Site Natural Resource Impacts
	USFS CGS Abandoned Mine Land Database	VEG_T	Vegetation type (e.g. B = barren, G = grass, R = riparian, etc.)	Inventory Areas
		VEG_DENSE	Vegetation density (e.g. D = dense, M = moderate, etc.)	Inventory Areas
		VEG_D	Vegetation density (e.g. D = dense, M = moderate, etc.)	Mine Piles
		VEG	Types of vegetation on or around mine dump (e.g. G = mixed grass, P = pine/spruce, etc.)	Mine Piles
	USGS PP 1651	KillZone	Presence of a kill zone.	Site
	BLM AMSCM from DOE Report	VIS_ROAD		
		VIS_TRAIL		

General Category	Database Name	Data Field Name	Description	Database Table Name
Visibility		VIS_POPUL		
		VISIBILITY		
	NPS Abandoned Mine Land Database	Visual	How visible is site from where visitors would be?	Site Natural Resource Impacts
Water	BLM AMSCM from DOE Report	FLOW_H2O		
		GULLIES		
		RILLS		
		BM_SURFH2O		
		AM_SURFH2O		
		AJ_SUR_H2O		
		AJ_GRD_H2O		
		ORE_H2O		
		WASTE_H2O		
		TAILS_H2O		
		STAND_H2O		
		WATER_PRES		
		WATER_PROD		
		H2O_PRES		
		SHEETWASH		
		WATER_TYPE		
		WATER_NEAR		
	CDRMS Field Data Sheet	Drainage w/ flow, ppt, pH, etc.		
	DOE Abandoned Uranium Mines	DistanceToStream	Distance to Stream	tbl_Mine_MineGroup
		Comment	Comment	tbl_GroundwaterData
		DistanceToWell	Distance to Well	tbl_Mine_MineGroup
		Comment	Comment	tbl_SurfaceWaterData
	NPS Abandoned Mine Land Database	Water	Standing water at site?	Site Natural Resource Impacts
		Sediment	Sedimentation into surface waters?	Site Natural Resource Impacts
		Watershed	Primary watershed name that would be used when partnering with other agencies on major clean-up projects.	Site - General
		Effluent	Effluent from site?	Site Natural Resource Impacts
		Flooded	Flooded, or evidence of flooding?	Feature Hazards
		Water_Tail	Water flowing through tailings or mineralized waste rock?	Site Natural Resource Impacts
	USFS CGS Abandoned Mine Land Database	ETSD	Evidence of toxicity in site drainage (e.g. W = opaque water, P = yellow/red precipitate, etc)	Water
		NEXT_STRM	Name of stream into which nearest stream flows into	Inventory Areas
		NEAR_STRM	Stream name flowing nearest to inventory area	Inventory Areas
		DRAINAGE	Description of water draining from the mine opening (e.g. W = water draining, etc.)	Mine Openings
		WCU	Water catalog number (EPA defined)	Inventory Areas
		NWATER	Number of water tests performed in area	Inventory Areas
		DRAINAGE	Type of water drainage occurring on or around the mine dump (W = water draining across surface, etc.)	Mine Piles
		CFS	Water discharge in gallons per minute (that's right, in gpm NOT cfs)	Water
		CFS_DATE	Date water discharge was measured	Water
		CFS_METHOD	Method of measuring water discharge (e.g. E = estimate, W = weir, L = flume, etc.)	Water
		SAMPLE_LOC	Location where water data was obtained in relation to the mine feature (e.g. A = immediately adjacent to adit/shaft, B = below dump/tailings, etc.)	Water
		ETRS	Evidence of toxicity in the closest receiving stream to the mine feature (W = opaque water, D = salt deposits, etc.)	Water
		FID	Feature id of the mine opening or dump where the water sample was taken (usually 100-199 or 200-299)	Water
		WATER_DESC	Description of water at sample location.	Samples
		STANDING_W	Indicates wheter water tested was standing water (0 = sample not from standing water, etc.)	Samples
		MOD_Q_GPI	Modifier for water discharge measurement (E = estimated, M = measured, etc.)	Samples
		ESQ_Q_GPM	Water discarge in gpm	Samples
		FLOW_CFS	Water discharge in cfs	Samples
		BASIN	Drainage basin name (only completed for the Columbine Ranger District)	Samples
		STREAM_DES	Streambed sample location description.	Samples
		DIST_STR	Distance from the water test and/or sample location to receiving stream (ft)	Water
	USGS PP 1651	DrainageArea	Drainage area of basin upstream of site, in square miles.	Site
		Stream	Stream on which site is located (if applicable).	Site
		LowFlowLowRge	Low-flow rate, low range, in gallons per minute.	Site
		LowFlowHighRge	Low-flow rate, high range, in gallons per minute.	Site
		DistanceToStream	Distance of mine site to stream, in meters.	Site
		SiteCategory	Manmade disturbances upgradient or upstream from water-quality sampling site; 1: none, 2: potentially some, 3: some, 4: definite.	Site
Wildlife	BLM AMSCM from DOE Report	WILDLIFE		
		ANIML_DES		
		ANIML_PRES		
		WILDLIFE_U		
		ANIML_EVID		
	CDRMS Field Data Sheet	Possible Bat Habitat?		
	NPS Abandoned Mine Land Database	Biology_Notes	Notes on biological issues present	Feature Biological Resources
		Bats	Bats (or evidence of bats) observed?	Feature Biological Resources
		Species_Concern	Other species of concern present?	Feature Biological Resources
		Species_TE	T & E species present?	Feature Biological Resources
		BiolRes_Signif	Significant biological resource values?	Feature Biological Resources
	USFS CGS Abandoned Mine Land Database	BATS	Evidence of bat activity (e.g. N = No, G = guano, B = bat sighting, etc.)	Inventory Areas
Wind	BLM AMSCM from DOE Report	WIND_EROS		
		POT_WIND_E		
	USFS CGS Abandoned Mine Land Database	WIND_EROD	Desciption of susceptibility of mine dump to wind erosions (e.g. N= none, D= dunes, etc.)	Mine Piles

NOTES: General categories may include information from other data types. Data fields were assigned to these general categories here for analysis purposes only.
Data field names and descriptions were not provided directly from the BLM and CDRMS therefore, the 2014 DOE report (DOE, 2014) was used to determine the data fields
Data dictionaries were not available for several of the databases including the BLM AMSCM, CDRMS Brass Caps, and the CGS Historic Coal Mine Database
Field inventory sheets were used to indicate data collected and likely input into the BLM AMSCM and CDRMS Brass Cap databases based on communications with these agencies
Although there may be data fields in these categories, these fields may not be populated in the actual database.
** IDs include database generated ID numbers, unique ID numbers, etc.
BLM - U.S. Bureau of Land Management
CDRMS - Colorado Division of Reclamation, Mining, and Safety
CGS - Colorado Geological Survey
DOE - Department of Energy
NPS - National Park Service
USFS – United States Forest Service
USGS PP - United States Geological Survey Professional Paper

Appendix D

LiDAR AML Feature Mapping St. Kevin Mining District

The CGS performed a desktop comparison of mining features from the USFS CGS AML inventory and USGS topographic prospect and mine-related symbols to features identified using LiDAR data in the St. Kevin mining district near Leadville, CO (Figure D-1).   Piles and pits associated with mining were identified on LiDAR maps using ArcGIS. These data are compared with the USGS CGS AML inventory in Figure D-2 and USGS symbols in Figure D-3. Many additional mine features were identified using the LiDAR information due to the ability of LiDAR to map surfaces through forested terrain as shown in Figure D-4. Although many more features were identified, a field inspection of these features would still be required as many of these features are likely associated with prospect pits/holes and may or may not contain physical and/or environmental hazards. As shown on the maps in Figure D-5, LiDAR mapping also provides more accurate feature locations when compared with these data sets. LiDAR is a very useful reconnaissance tool that should be used in conjunction with field assessments to provide accurate locations of mining features, and potential features, in areas where it may be difficult to see on the ground. Data from the field assessment can be used to better evaluate and assess the pits and piles identified using LiDAR.

During this investigation, CGS also compared the USGS prospect and mine-related topographic mine symbols to the USGS geological map for this area (Tweto, 1974). As shown in Figure D-6, the topographic map data set does not include all the features identified on the geological map however, even the features identified on the geological map do not match the number identified using LiDAR.

Figure D-1 – Site Location Map and LiDAR Study Boundary.
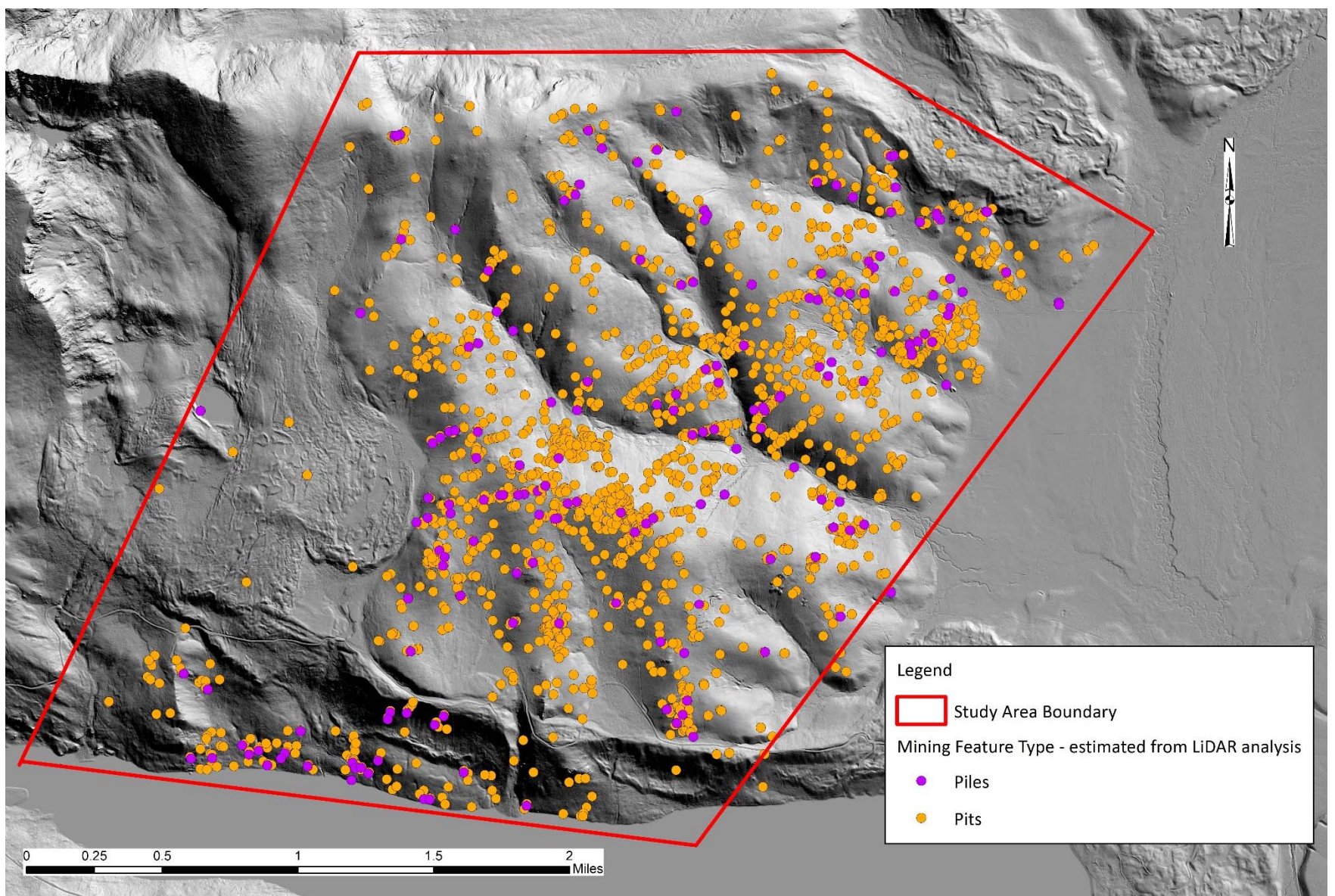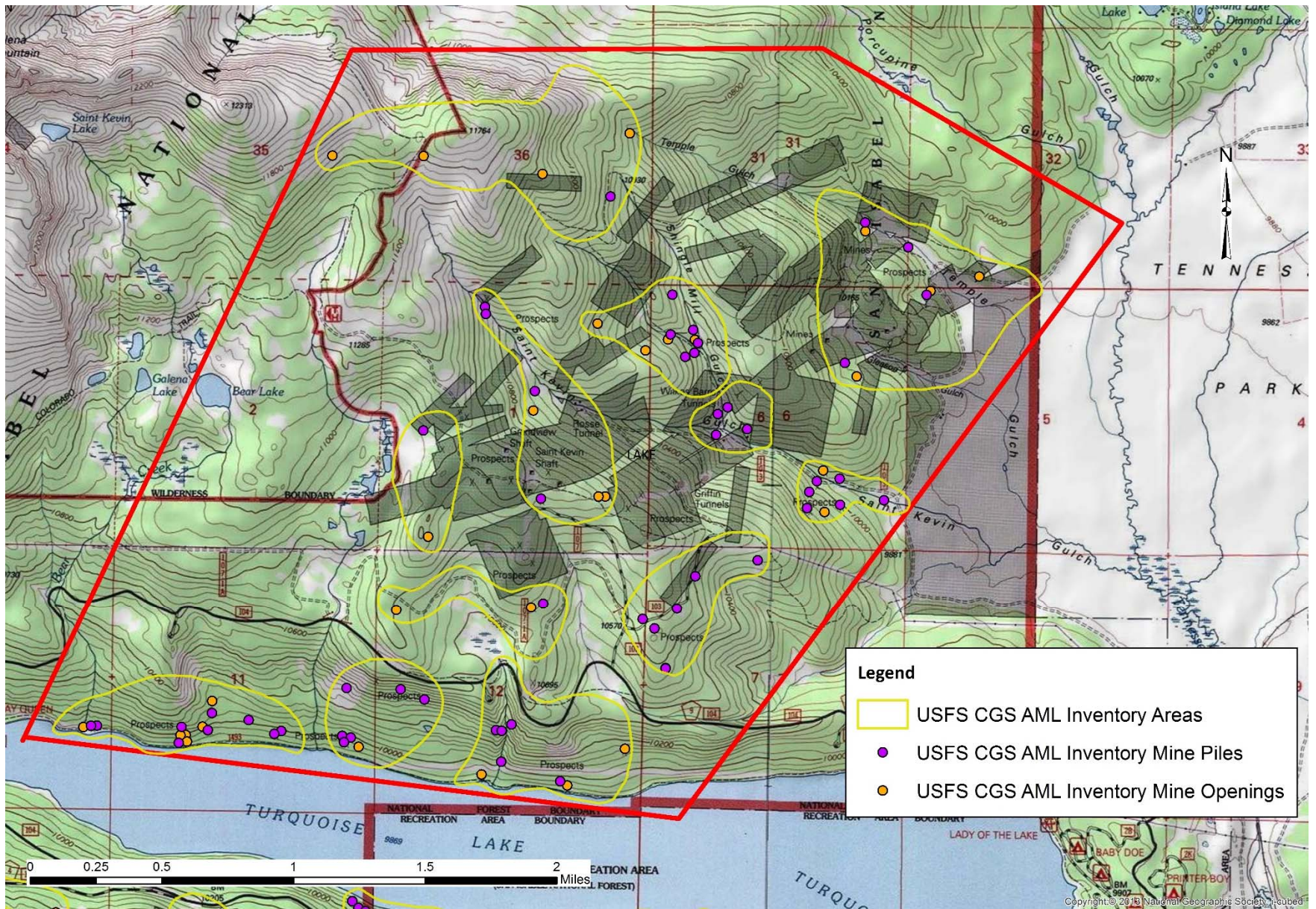
Figure D-2 – USFS CGS AML Features Compared to LiDAR Mine Features Map, St. Kevin Area. Maps showing the locations of AML features in the St. Kevin mining district just west of Leadville, CO, and the boundary used to compare to LiDAR mapping. Top: AML features delineated during the USFS CGS field visit in the 1990s (polygons are areas where the AML survey took place). Bottom: AML features estimated by hand using LiDAR maps in ArcGIS during this analysis.
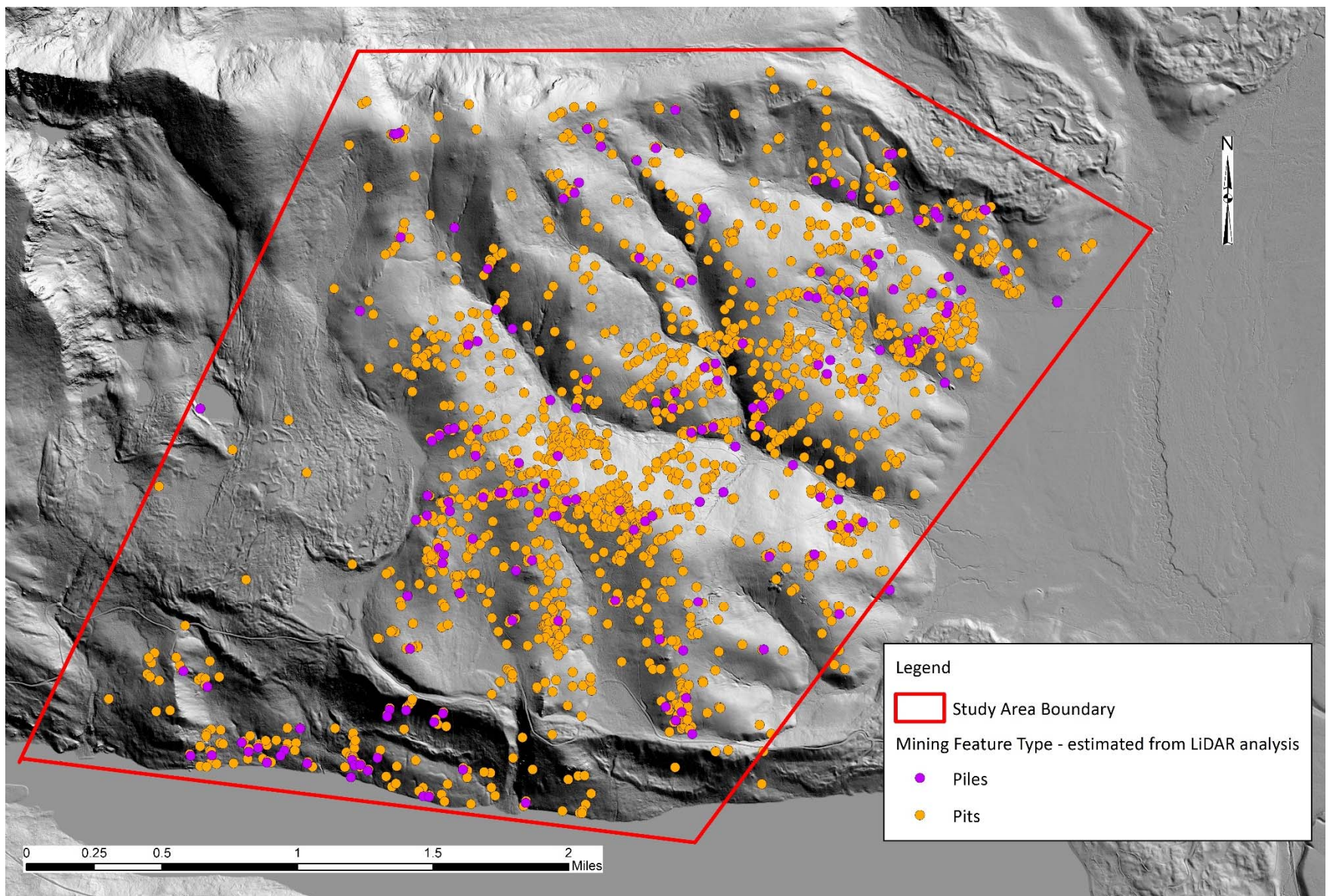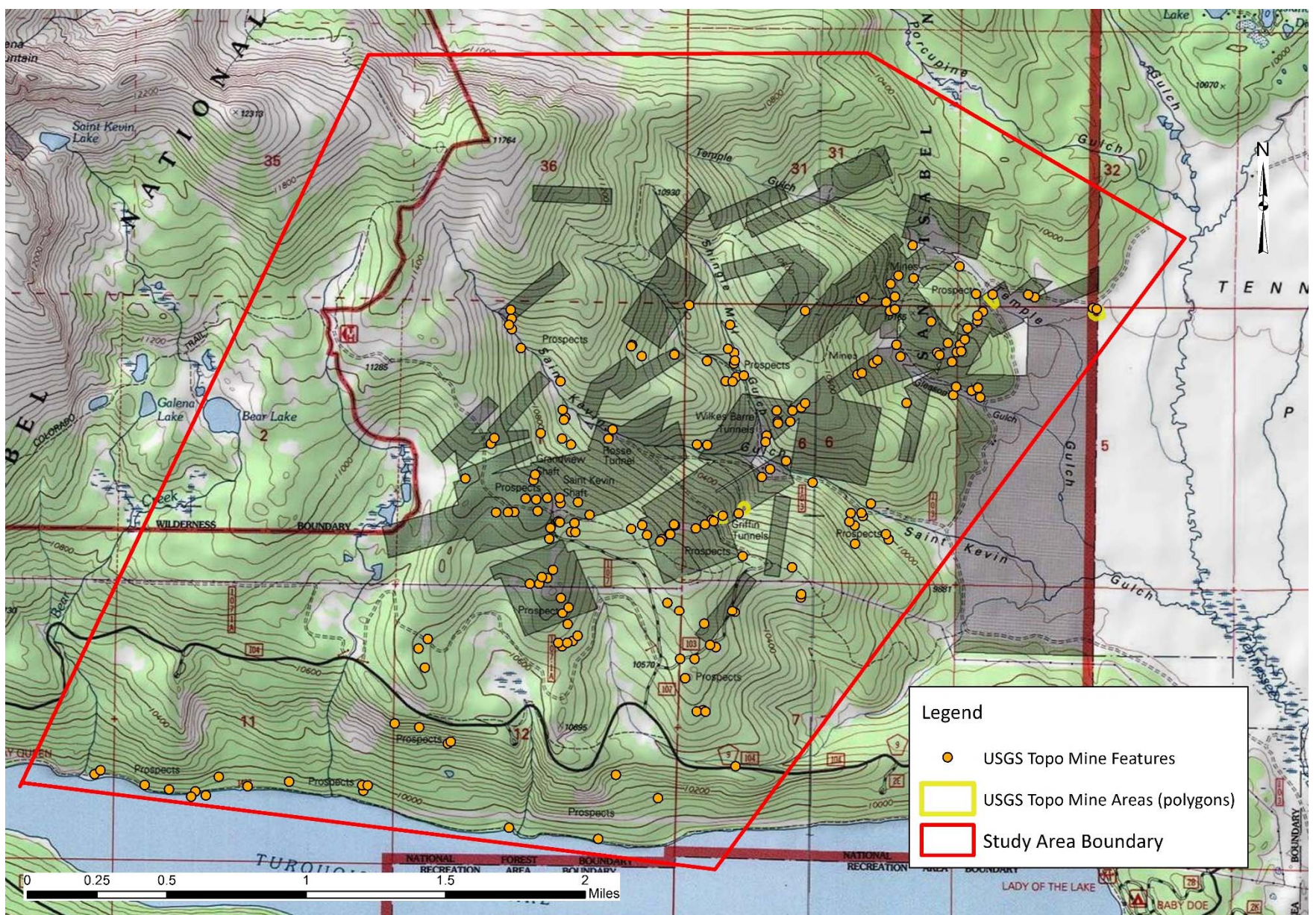
Figure D-3 – USGS Prospect- and Mine-Related Features Compared to LiDAR Mine Features Map, St. Kevin Area. Maps showing the locations mining and AML features in the St. Kevin mining district just west of Leadville, CO, and the boundary used to compare to LiDAR mapping. Top: Mining features from the USGS topographic map mine symbol database (includes mine features and areas from the USGS 24K, 48K, and 62.5K topographic maps). Bottom: AML features estimated by hand using LiDAR maps in ArcGIS during this analysis.
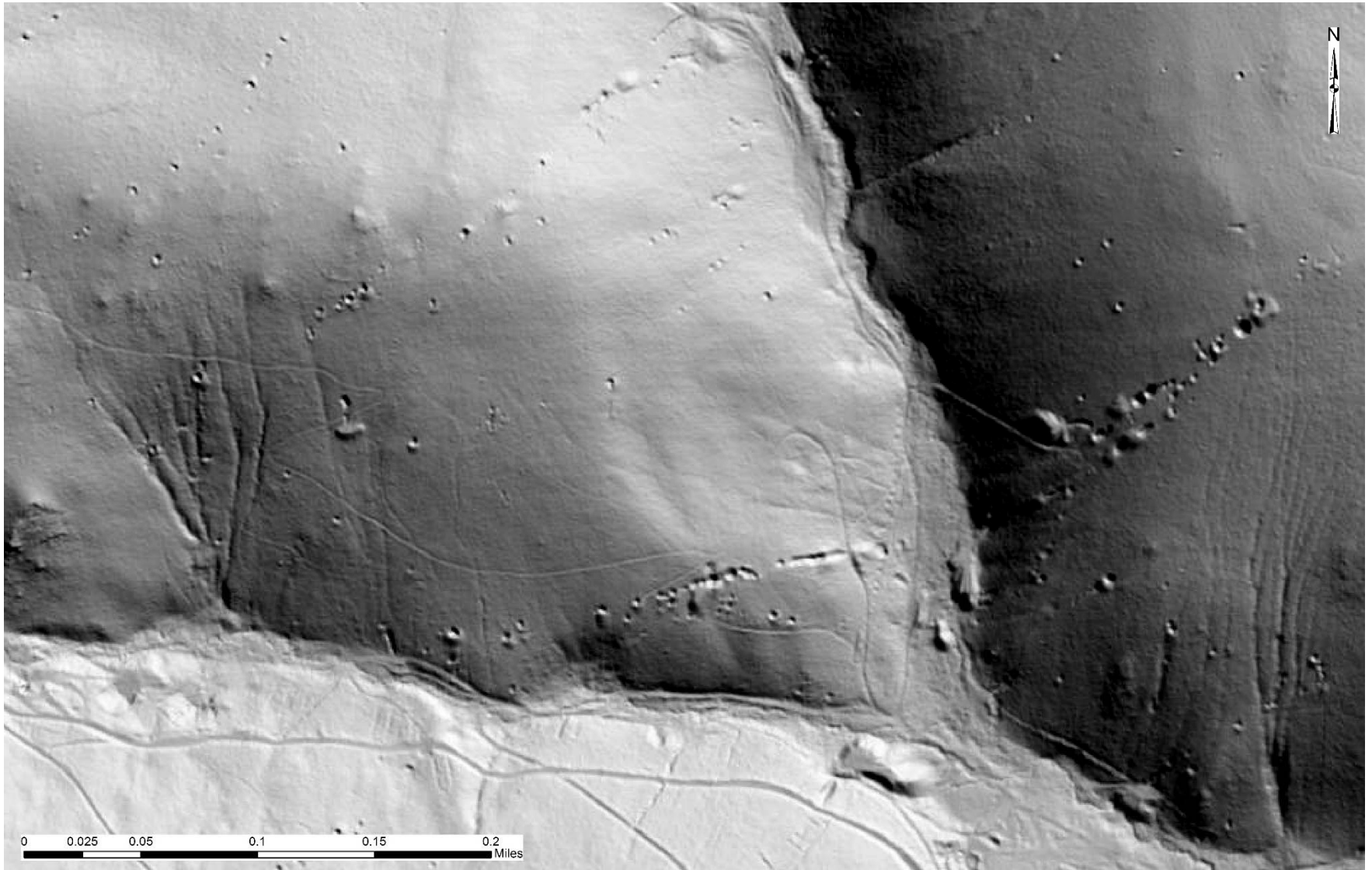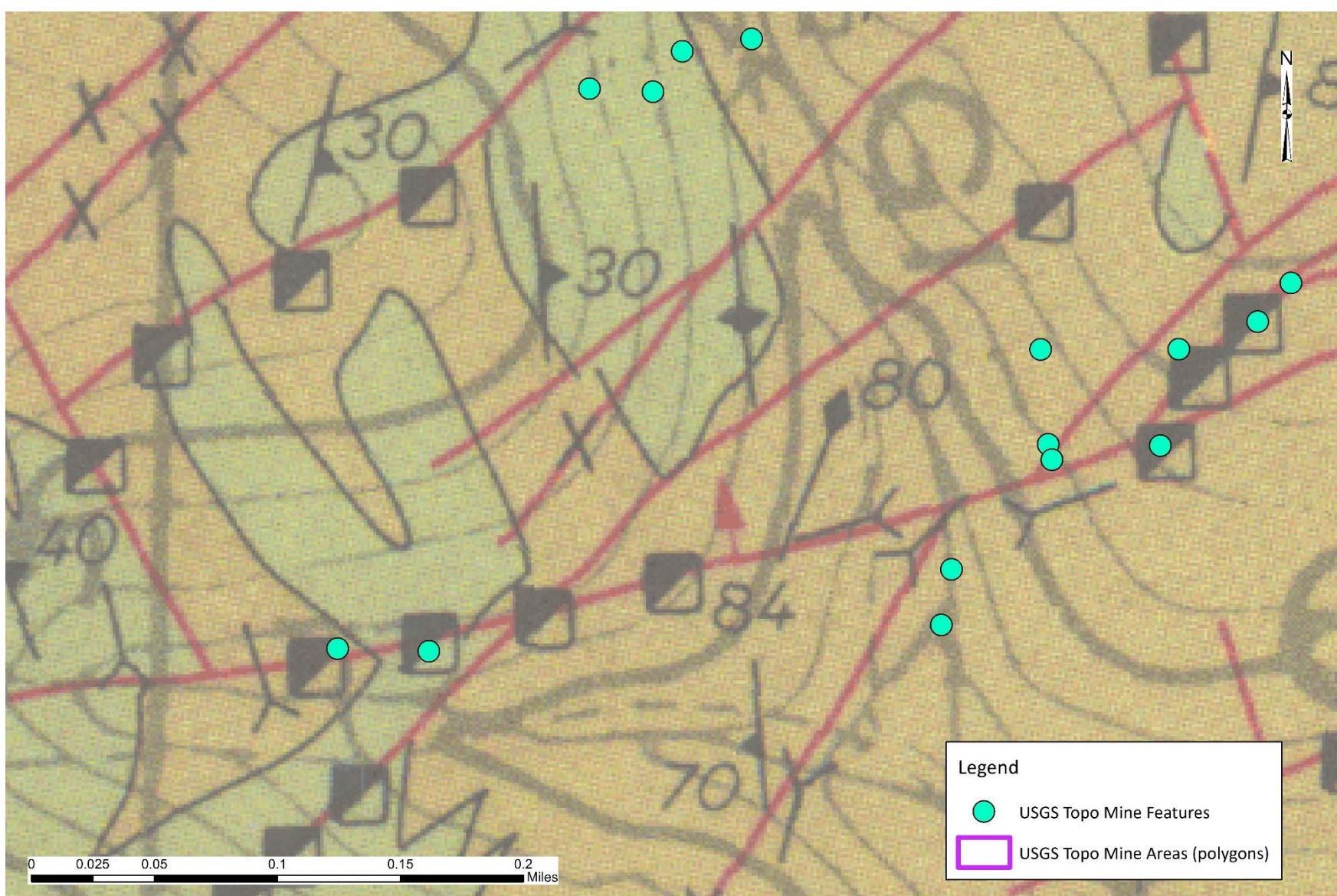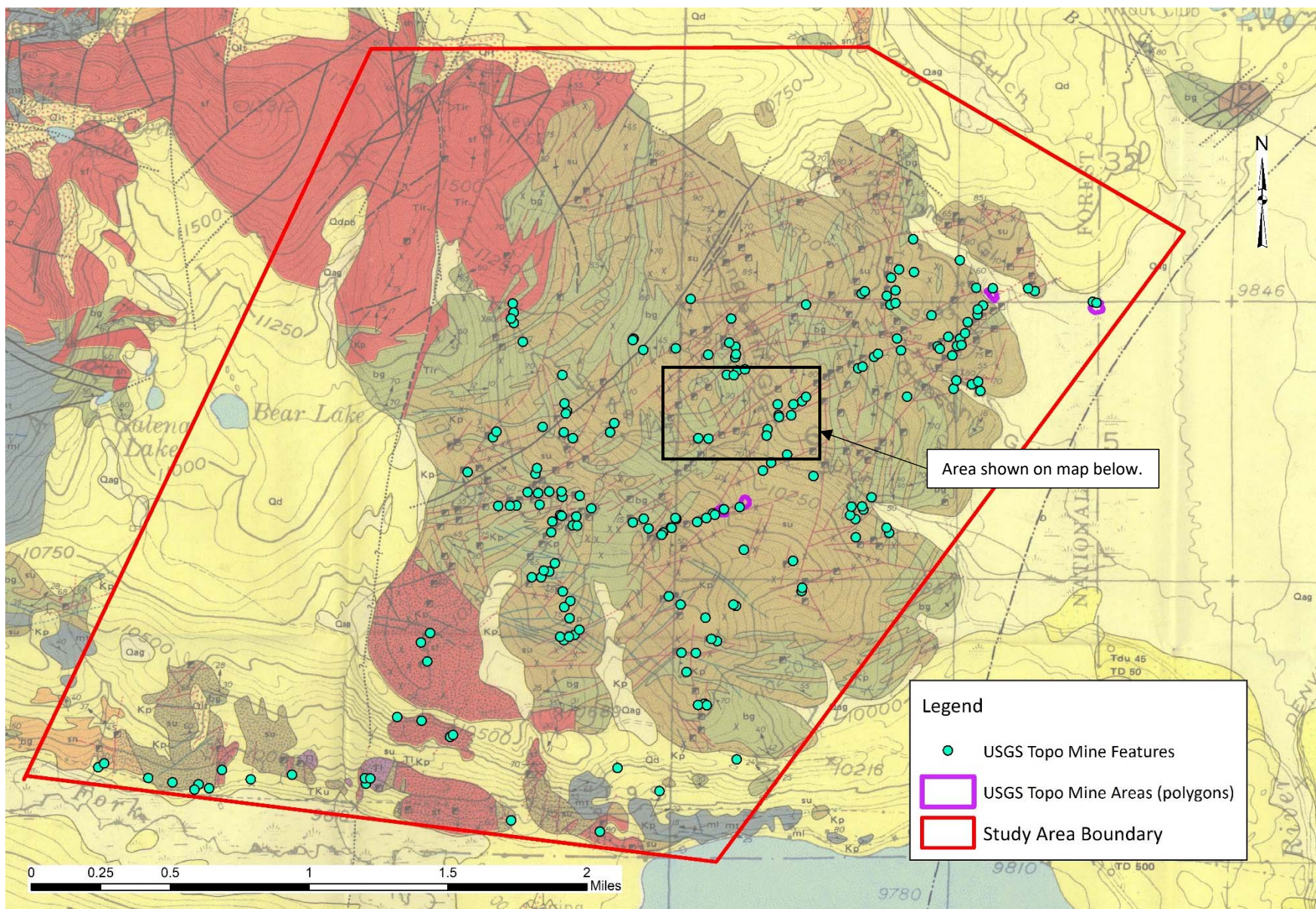
Figure D-4 – Detailed LiDAR and Satellite Imagery Map of Kevin Gulch. Maps showing the locations mining and AML features in the St. Kevin mining district just west of Leadville, CO. Top: Detailed view of LiDAR mapping in Kevin Gulch. Bottom: Satellite imagery in the same area as the top LiDAR image.
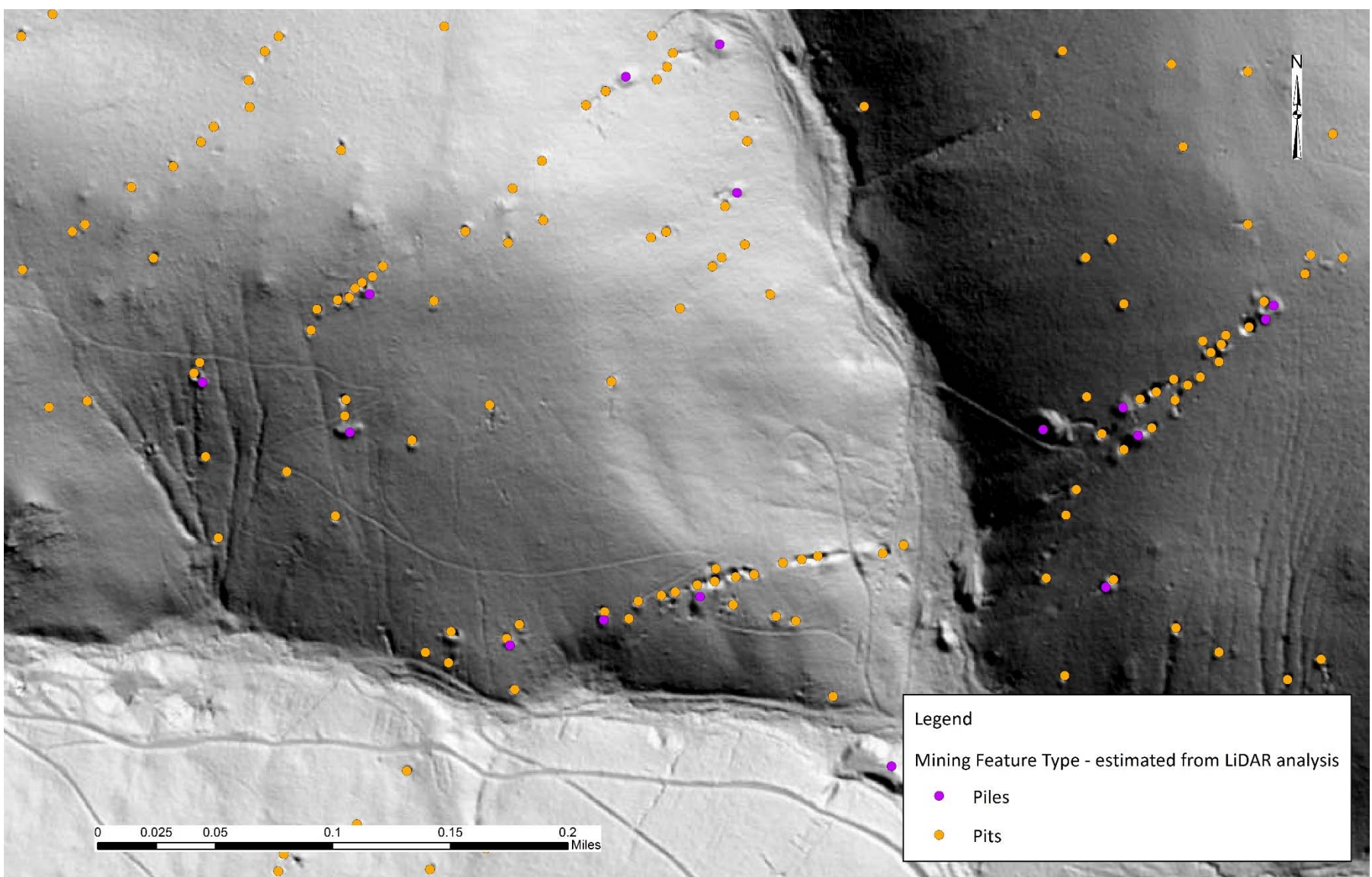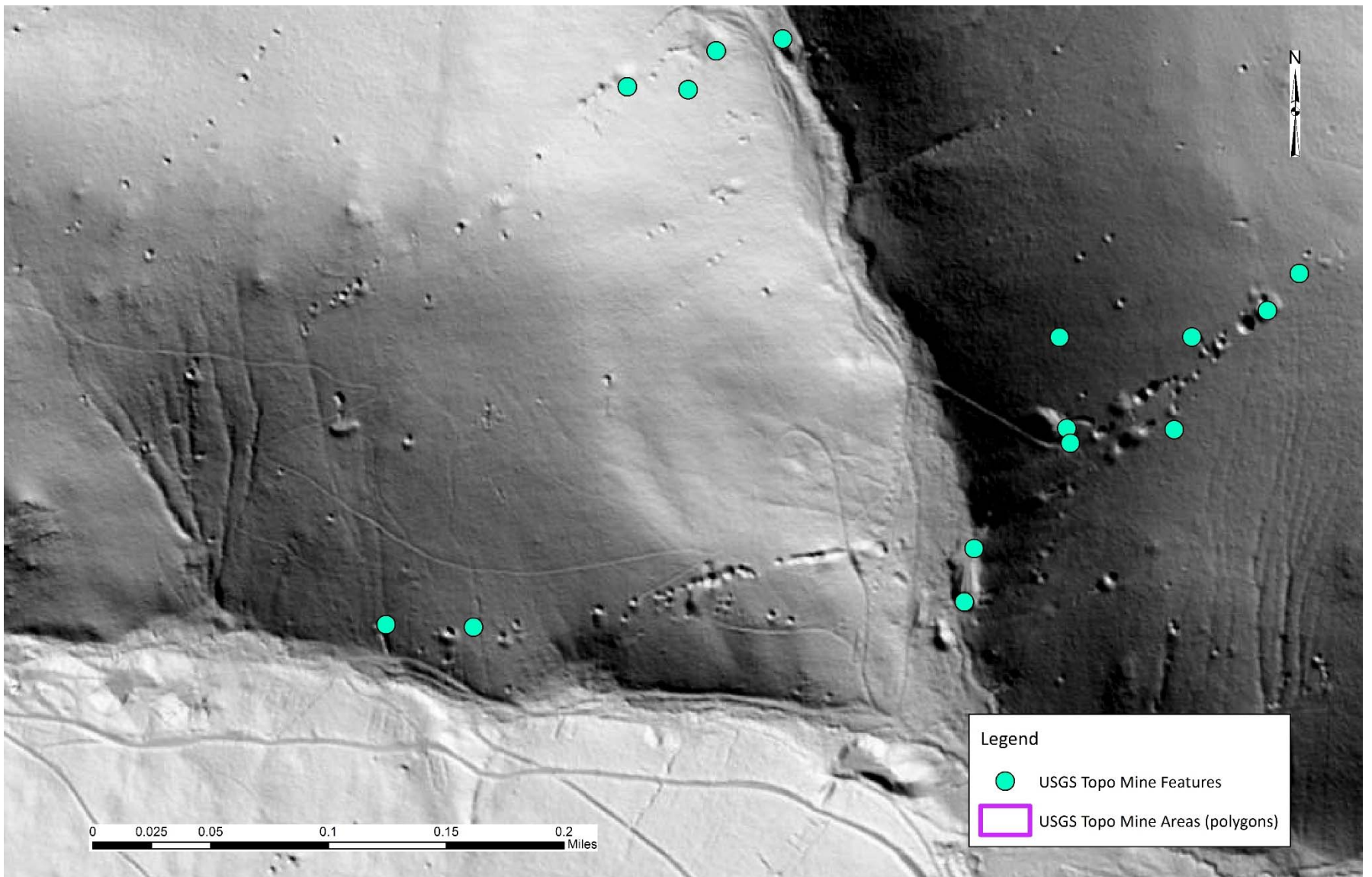
Figure D-5 – Detailed USGS Prospect- and Mine-Related Features Compared to LiDAR Mine Features Map, Kevin Gulch. Maps showing the locations of mining and AML features in the St. Kevin mining district just west of Leadville, CO. Top: Mining features from the USGS topographic map mine symbol database (includes mine features and areas from the USGS 24K, 48K, and 62.5K topographic maps) shown on the LiDAR base map. Bottom: AML features estimated by hand using LiDAR maps in ArcGIS during this analysis.

Figure D-6 – USGS Geological Map Symbols Compared to USGS Topographic Map Prospect- and Mine-Related Symbols, St. Kevin Area. Maps showing the locations of mining and AML features in the St. Kevin mining district just west of Leadville, CO, and the boundary used to compare to LiDAR mapping. Top: Mining features from the USGS topographic map mine symbol database (includes mine features and areas from the USGS 24K, 48K, and 62.5K topographic maps) with the USGS geological base map (Tweto, 1974; 1:24,000) showing mining features. Bottom: Detail of the area on the top map showing USGS digitized topographic map features compared to USGS geologic map mine features.

Abandoned Mine Land Inventory and LiDAR Features, a Comparison in the Fulford Mining District

An area of interest (AOI) was chosen in the Polar Star Mine region of the Fulford mining district to compare the results of a LiDAR inventory (2018) of potential mining related features to mining features inventoried during the Abandoned Mine Land Forest Service (AML-FS) project (completed pre-LiDAR by the Colorado Geological Survey in 1999). Seventy-three features were identified on a LiDAR digital elevation model (DEM) (Figure D-7) with a 1-meter resolution within the AOI. The identified features were chosen based on anomalies with potential to be related to mining activity. Forty eight of the LiDAR features were field checked over several days during September, 2018. The field results were then compared to the AML-FS inventory that included 17 features in the AOI.

Part of this comparison also evaluated the USGS marked mine locations, readily available on the published USGS 1:24 000 topographic maps. These maps and their mapped mine features formed part of the basis for field efforts during the AML-FS project. The intent of this comparison of LiDAR to the AML-FS inventory was in part to learn how LiDAR can be used for future analysis of historic mining activity. The data set is shown in the following image.
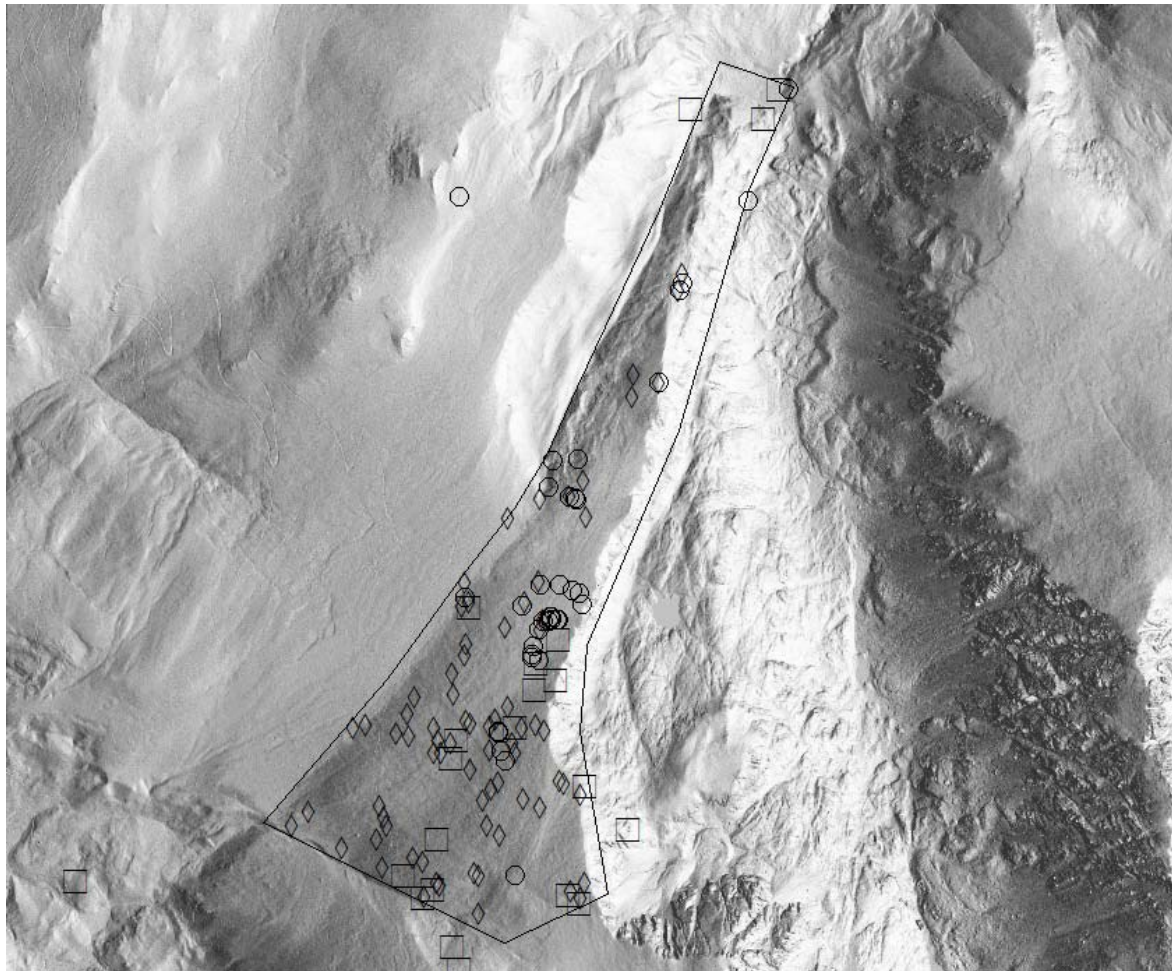

Figure D-7. AOI overlain on LiDAR DEM (1:20,114) with three types of data points. Diamonds are features chosen using LiDAR, squares are points in the AML survey, and circles are areas field checked for this study.

Results

All but several of the points picked out on LiDAR were some type of mine feature. Three features identified by LiDAR were not mine related but were erosion features in talus and tundra slopes where the resulting feature could easily be mistaken for a small pit in the LiDAR such as in the following picture (Figure D-8).

 Figure D-8. Feature on the LiDAR representing erosion in the tundra.

Five mine features were discovered randomly in the forest that had not been identified on the LiDAR or the AML-FS. The following picture (Figure D-9) is of ore-cart rails coming from a collapsed adit in a heavily wooded area. The Polar Star Mine region does not have springs or significant groundwater at the ground surface and no mine features in this region inventoried in the AML-FS had water associated with them. However, in other mining regions of Colorado, an adit deep enough to have utilized ore rails is likely to have mine effluent emanating from it.

Figure D-9. Ore cart rails extending onto a mine dump from a collapsed adit. This feature was not identified in the AML-FS project or on the LiDAR.

It is significant how few of the features noted on the LiDAR are described or noted in the AML-FS project. The majority of the LiDAR identified features were exploratory pits or trenches. Small exploration pits, while not excluded entirely, were not the focus of the AML-FS project. Additionally, there are millions of exploratory pits on Colorado lands and spending time inventorying them was discouraged unless they could be quickly added while working on the target features. Target features were mines with significant water flow followed by mines that posed a significant hazard to the public.

As exploration pits did not have mine effluent or water emerging from them and were small enough not to pose a significant hazard to the public, they were largely ignored during the AML inventory. If mine effluent was found it demonstrated a feature, such as a buried adit, with a conduit for groundwater and was not, by definition during the AML-FS project, an exploratory pit.

Unites States Geological Survey (USGS) mine features

The published topographic map (Grouse Mountain Quadrangle) includes several USGS mine features. Figure D-10, is of the topographic map showing a shaft and an adit below the text for Baryeta Cabins. The adit exists and was noted in the AML-FS inventory but the shaft is marked in a wetland area as shown in Figure D-11, and was not located either during our reconnaissance or during the AML-FS work. There are a number of small pits and exploration adits in the woods on the hill east of the shaft-feature not shown on the USGS map or inventoried during the AML-NF work.

Figure D-10. The Grouse Mountain Quadrangle depicting an adit and a shaft near the Baryeta Cabins.
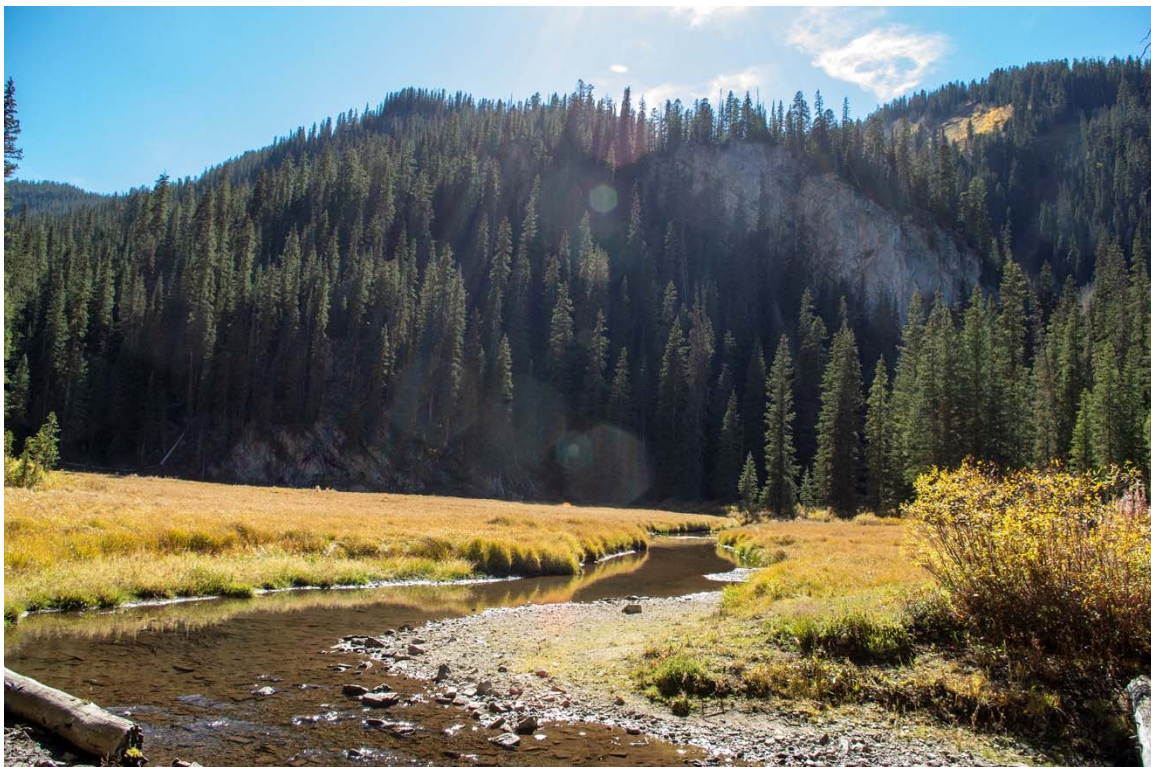

Figure D-11. Creek and wetland area where a shaft is marked on the USGS map but was not located in the field. An adit exists in the cliffs across the meadow as shown on the USGS map.

Conclusion

The majority of the features picked up on the LiDAR were some type of mine related disturbance. In no case did a feature discovered by the LiDAR document a feature that would have been considered "missed" during the AML inventory (i.e. a significant environmental or physical hazard). However, a field check can still result in mine features being located with the potential of being environmentally or physically significant.