



Overview of the Rimrock Mine (LM ID 488) Gateway Field Operations Plan

DRUM PROGRAM MIDYEAR PROGRESS REPORT

January 1-June 30

2020

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Introduction

The Defense-Related Uranium Mines Report to Congress (DOE 2014b) (Report to Congress) identified the potential legacy liability of specific abandoned uranium mines in the United States. This set of mines provided uranium ore for atomic energy defense activities of the United States from 1947 to 1970. The U.S. Department of Energy (DOE) Office of Legacy Management (LM) was authorized to initiate the Defense-Related Uranium Mines (DRUM) Program in fiscal year (FY) 2017. DOE subsequently established a five-year campaign to carry out verification and validation (V&V) work at approximately 2,500 legacy mines located on public land. This land is generally managed by the U.S. Forest Service (USFS), the U.S. Bureau of Land Management (BLM), and the U.S. National Park Service (NPS) for multiple uses, but primarily public recreation. This midyear report describes DRUM Program accomplishments and achievements for the reporting period of January 1-June 30, 2020. The report also provides information regarding overall program progress since July 2017 in order to provide context for the reporting period accomplishments.

DRUM Progress Summary

The DRUM Program's fourth field season began on March 2, 2020. Due to COVID-19 health concerns and work restrictions, field operations were suspended on March 19, 2020. Limited field operations resumed on May 18, 2020. These operations were ramped up as health and safety conditions improved until each of the five field teams averaged five complete V&V operations per week. As a result, 123 field V&V operations have been completed during the reporting period. Field V&V work has been completed at a total of 991 mines by the program to date. Of these mine site visits, 893 were conducted at mines on public land, 65 at mines on mixed-ownership land, 29 at mines on state-managed property, and four at mines on private property. LM has completed 214 mine-specific final V&V reports during the reporting period. Cumulatively, LM has completed 905 final V&V reports, of which 809 are for mines on public land, 64 are for mines on mixed-ownership land, 28 are for mines on state-managed land, and four are for mines on private property. All reports from the 2019 field season and all prior field seasons have been finalized.

The DRUM Program supports LM's strategic goal of "protecting human health and the environment" (Goal 1), and its strategic objective to "address the environmental legacy of defense-related uranium mining and milling sites" (DOE 2020a).

Significant DRUM Program accomplishments during the reporting period include:

- Prepared a roll-up document of risk rankings for the mines within each of the following completed V&V project areas (sorted by federal land management agency):
 - Carpenter Flats (20 mines) in western Colorado on BLM-administered land.
 - Deer Flat (13 mines) in southeast Utah on BLM-administered land.
 - Martin Mesa (21 mines) in western Colorado on BLM-administered land.
 - Royal Gorge Field Office (12 mines) in central Colorado on BLM-administered land.
 - White Canyon (26 mines) in southeast Utah on BLM-administered land.
 - Carson, Gila, and Santa Fe National Forests (9 mines) in northern New Mexico on USFS-administered land.
 - Cibola National Forest (5 mines) in central New Mexico on USFS-administered land.

- San Isabel and Rio Grande National Forests (8 mines) in southern Colorado on USFS-administered land.
 - White River National Forest (20 mines) in western Colorado on USFS-administered land.
- Prepared or revised Field Operations Plans that describe reconciled mine locations and provide guidance for a logical approach to field V&V work in specific geographic areas including:
 - Arizona Statewide Mining Districts (54 mines).
 - Gateway Mining District in Colorado and Utah (209 mines).
 - Henry Mountains Mining District in Utah (125 mines).
 - Monticello Mining District in Utah (180 mines).
 - Moab Mining District in Utah (46 mines).
 - Bull Canyon Mining District in the BLM Tres Rios Field Office in Colorado (122 mines).
 - Bull Canyon, Uravan, and Paradox Mining Districts in the BLM Uncompahgre Field Office in Colorado (41 mines).
 - San Rafael Mining District in the BLM Price Field Office in Utah (125 mines).
 - NPS land in Arizona, Montana, and Utah (38 mines).
- Participated in a mining panel for STEM student presentations at Tope Elementary School in Grand Junction, Colorado.
- Participated in the Federal Mining Dialogue meeting hosted by the U.S. Environmental Protection Agency (EPA); received an update from the U.S. Geological Survey on their Mineral Deposit Database project.
- Met with Freeport-McMoRan (Freeport), a multinational mining company, to assess the current overlap of the DRUM Program with their uranium mine safeguard and reclamation efforts. Freeport is safeguarding physical hazards at abandoned mines in Colorado and Utah to which they have historical owner/operator ties.
- Obtained concurrence from the forest supervisor of the White River National Forest (Colorado) to execute safeguarding of physical hazards at DRUM sites.
- Revamped the DRUM Program website to ensure it reflects field data collection activities.
- Assisted BLM Utah State Office, using our interagency agreement, in the development of a Decision Making Manual/Risk-Based Ranking Strategy for Utah Abandoned Mine Sites (BLM 2019).
- Completed the PowerPoint presentation *Development of Radiological Screening Levels and Associated Gamma Survey Methodologies for Radiological Characterization at U.S. DOE Office of Legacy Management Defense-Related Uranium Mine Sites*.
- Published the Defense-Related Uranium Mines Annual Report, January 1-December 31, 2019 (DOE 2019).
- Updated the Defense-Related Uranium Mines Safety Plan (LMS/DRM/S15804) to reflect operational experiences from the 2019 field season and expectations of the 2020 field season.
- Conducted a “Spring Training” refresher course for all program personnel to prepare for the 2020 field season.

- Completed an update of the *Defense-Related Uranium Mines Program Management Plan 2020-2030* (LM Plan 3-23-1.0, LMS/DRM/S15809).
- Provided a technical briefing and demonstration of field assessment techniques for the BLM Richfield Field Office, Utah.
- Published the *2020-2030 Strategic Plan, Defense-Related Uranium Mines Program* (DOE 2020a) to reflect programmatic progress and map the way ahead.
- Developed an outline for a conceptual reclamation plan and a rough order-of-magnitude cost estimate based on reclamation activities associated with abandoned bauxite mining in the Republic of Palau.
- Virtually attended San Miguel County Commissioner's board meeting held in Telluride, Colorado. Provided overview of the DRUM Program.
- Implemented a multi-phased COVID-19 Recovery Plan to allow for resumption of safe field V&V operations.
- Worked with USFS, BLM, NPS, and the Mine Safety and Health Administration to plan and execute the 2020 Interagency Abandoned Mine Safety Training Course, which was held virtually May 19-21, 2020. DRUM team taught segments on radiological screening levels and gamma radiation survey methods.
- Updated the *Defense-Related Uranium Mines Verification and Validation Work Plan* (DOE 2020c) to incorporate operational experiences (common deviation requests) from the 2019 field season and streamline field processes for the 2020 field season.
- Created the Defense-Related Uranium Mines Risk Screening Process (DOE 2020b) guidance document, including additional screening levels to better support partner agency decisions.
- Met with EPA Region 6 regarding their Airborne Spectral Photometric Environmental Collection Technology program, which may be used to conduct aerial radiological surveys of large mine sites in Wyoming.
- Hosted an Abandoned Uranium Mines Working Group (AUMWG) conference call meeting. Information regarding partner agency planned activities, including future DRUM Program direction, mine-specific risk assessments activities, and ongoing V&V program and future hazardous mine feature safeguarding opportunities, was shared between the participants. Efforts led to the publication of the following documents:
 - *The Abandoned Uranium Mines Working Group Communications Strategy* (AUMWG 2019a)
 - *Annual Stakeholder Report, January 1-December 31, 2019* (AUMWG 2019b)
- Completed business impact/process and mission essential function analyses for the Uranium-Related Programs in support of the organization's Continuity of Operations Plan.
- Completed 429 mine reconciliations, 123 field V&V operations, and 214 final reports.

In 2020, field work is focused on completing V&V operations in uranium mining districts in Colorado and Utah, where most DRUM Program mines are located. This strategy contrasts with the 2019 field work season, which included visiting mines in Colorado and Utah, as well as in Wyoming, South Dakota, and North Dakota. Partnerships and interagency agreements (IAA) with BLM, USFS, and NPS were previously completed and were updated to allow for DRUM-related expenditures by

those agencies. A nonfunded IAA with USFS has been established to define roles and responsibilities in cooperatively handling safeguarding activities. A new IAA with the BLM national office is being pursued to encompass V&V and safeguarding activities. LM is finalizing a cooperative agreement with Bat Conservation International (BCI) to facilitate implementation and continuity of the upcoming hazardous mine entry safeguard projects, including development of National Environmental Policy Act documentation and hazardous entry safeguard design and construction. LM and the Colorado and Utah Abandoned Mine Lands (AML) programs amended their cooperative agreements in order to facilitate hazardous mine entry safeguarding activities by those agencies.

LM and partner agencies are prioritizing safeguarding physical hazards (primarily mine entries) identified by the DRUM Program. Discussions with partner agencies have identified several physical hazard safeguarding projects that will be initiated during FY 2021. In the fall of 2020, LM is executing a pilot project with the BLM Uncompahgre Field Office to safeguard 26 abandoned mine features in Long Park in Montrose County, Colorado. Environmental compliance activities, design, and construction for these safeguard projects will primarily be implemented by partner federal and state agencies, as well as by BCI. LM will provide funding to allow partner agencies to complete these safeguard projects.

DRUM Return on Investment

The Report to Congress identified 4,225 potential mines on federal, state, tribal, and private land. Of these, the report estimated that 2,500 mines were on public land. Although the total potential liabilities are not explicitly spelled out, the report estimated that 80% of these mines would require safeguarding (referred to as “reclamation” in the report) and 20% would require environmental remediation work. Safeguarding is the act of mitigating mining-related physical hazards, generally by constructing barriers to human access at the entries to underground mines. Reclamation is the process of restoring essential geomorphic functions at previously mined locations. This process may include recontouring waste rock piles and other mining-related disturbances to minimize erosion potential and blend the mine site with the adjacent undisturbed landscape. Remediation involves isolating contaminants or pollutants from the surrounding environment, generally by consolidating waste materials and performing environmental restoration work. The Report to Congress estimated that mines which exhibit threats to human safety would require an average of three safeguards each at an estimated cost of \$18,000 per constructed safeguard, an average of \$54,000 per affected mine. The Report to Congress estimated that the mines that require remediation under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) to alleviate environmental concerns may require an average of \$1,300,000 per mine. The estimated cost to remediate mines was calculated using data from Table 4 in the Defense-Related Uranium Mines Cost and Feasibility Topic Report (DOE 2014a). The maximum remediation cost for each mine size category was multiplied by the percentage of mines in that size category to derive the estimated cost per mine of \$1,300,000 (rounded).

Applying cost estimates from the Report to Congress for physical hazard safeguarding to the estimated potential liabilities associated with mines on public land suggested a possible physical hazard liability of \$108,000,000. Applying cost estimates from the Report to Congress for remediation work to the estimated potential environmental liabilities associated with mines on public land suggested a possible remediation liability of \$650,000,000. Implementation of the current DRUM campaign, V&V work at mines on public land, and the screening of these mines

for potential risks to human health and safety have allowed the program to substantially reduce projected potential liabilities.

The DRUM Program reduces potential liabilities in two ways: (1) removing duplicate mining records from the DRUM Program database, thereby decreasing the estimated total number of existing mines; and (2) applying risk screening results to refine the estimated environmental liabilities based on observed conditions at the mines. To date, 948 duplicate records have been removed from the database, clarifying the actual number of existing mines, eliminating the estimated liability associated with the mines removed from the database, and decreasing the overall estimated potential liability.

Following reconciliation, the count of mines in the DRUM Program database at the end of the reporting period shows that 2,022 mines are on public land. This number will fluctuate until the public land campaign is completed. Analysis of site risk screening evaluations completed to date shows that approximately 60% of mines will require safeguarding for physical hazards compared to the 80% estimated in the Report to Congress. The Report to Congress estimated that an average of three safeguards per mine would be required at mines where hazardous entries were identified. DRUM Program field inventory information appears to validate this assumption. These updated estimates result in a safeguarding cost liability reduction of approximately \$42,498,000.

DRUM field work completed to date suggests that approximately 16% of the mines could require further analysis via the CERCLA process. When implemented, the CERCLA process will be handled by the appropriate land management agencies. This is a smaller population of mines than the 20%, which had been estimated in the Report to Congress. If this trend continues, the resulting potential remediation liability will be reduced from about 500 mines (the Report to Congress estimate) to about 324 mines, representing a reduction in potential liability of approximately \$228,800,000 (Table 1). The total projected program expenditure of \$25,000,000 (\$5,000,000/year for five years) has the potential to reduce liability by an estimated \$271,298,000, a return on investment of roughly 11:1.

Table 1. Estimated Versus Projected DRUM Actions and Expenditures at Mines on Public Land

	Report to Congress Estimates	Program Estimates as of June 30, 2020	Difference
Number of mines	2,500	2,022	478 mines
Estimated number of mines to safeguard	2,000 ^a	1,213 ^b	787 mines
Estimated cost to complete safeguards ^c	\$108,000,000 ^a	\$65,502,000 ^b	\$42,498,000
Estimated number CERCLA eligible mines	500 ^a	324 ^b	176 mines
Estimated cost to complete CERCLA remediation ^d	\$650,000,000 ^a	\$421,200,000 ^b	\$228,800,000

Notes:

^a Estimates based on Report to Congress population of 2,500 mines.

^b Estimates based on population of 2,022 mines.

^c Safeguard construction estimated at \$54,000 per mine.

^d CERCLA remediation costs estimated at \$1,300,000 per mine.

V&V Progress

The DRUM Program will have completed most of the V&V field work at mines on public land by the close of FY 2022 (September 30, 2022). V&V activity consists of: (1) a reconciliation step completed in the office to confirm land status, location, and ore purchase data for each mine and to remove duplicate purchase records from the database; (2) an inventory step to confirm the mine location in the field and to gather information regarding mine features and their potential hazards; (3) an environmental sampling step to collect chemical, radiological, and ecological data; and (4) a report preparation step. Field V&V work is completed after inventory and environmental sampling are complete or after inventory is complete for mines that do not require sampling. Draft and final reports are prepared for each mine following completion of V&V activities. Draft reports are generally submitted 120 days after field V&V work is completed. Final reports are prepared once LM reviews and accepts the draft reports. Merged duplicates are documented on a certificate, and V&V activity is considered completed once the certificate is produced.

During the reporting period interrupted by COVID-19, 119 V&V operations have been completed on public land (Table 2). Cumulatively, V&V work has been completed at 893 mines on public land, and 948 duplicate records have been removed. Cumulatively, 809 final reports for mines on public land have been completed, including the 214 final reports completed during the reporting period (Table 3). Draft report production is current with field V&V work, and draft reports representing 2020 field visits are currently in production.

Table 2. V&V Progress on Public Land for the Period January 1-June 30, 2020

Land Management Agency	Reconciliation Completed	Inventory Completed	Environmental Sampling Completed	Total V&V Complete	Number Final Reports
BLM	215	118	119	119	148
USFS	0	0	0	0	65
NPS	0	0	0	0	0
U.S. Bureau of Reclamation	0	0	0	0	0
U.S. Fish and Wildlife Service	0	0	0	0	0
U.S. Department of Defense	0	0	0	0	1
Duplicates	125				
	340	118	119	119	214

Table 3. Cumulative V&V Progress Through June 30, 2020

Land Management Agency	Reconciliation Completed	Inventory Completed	Environmental Sampling Completed	Total V&V Completed ^a	% V&V Completed ^b	Mines Remaining to V&V ^c	Final Reports Completed	% Final Reports Completed ^d
BLM	1,656	766	730	732	43%	975	647	88%
USFS	322	165	151	158	48%	171	159 ^e	100%
NPS	38	0	0	0	0%	38	0	NA
U.S. Bureau of Reclamation	3	0	0	0	0%	4	0	NA
U.S. Fish and Wildlife Service	2	2	2	2	100%	0	2	100%
U.S. Department of Defense	1	1	1	1	100%	0	1	100%
Duplicates	948							
	2,970	934	884	893		1,188	809	

Notes:

^a Total V&V complete includes all mines visited where environmental sampling was completed and mines field visited but where no environmental sampling was required (e.g., previously remediated mines or mine locations where there was no evidence of mining operations).

^b Percent V&V completed is based on number of mines out of those that have been reconciled where all V&V work is complete.

^c Mines remaining to V&V is the total number of reconciled and unreconciled mines that have not been field verified or removed as duplicates from the database.

^d Percent final reports completed is based on the number of mines out of those where all V&V work is complete for which final V&V reports have been produced.

^e The program determined that a mine needed to be revisited following issuance of the final report. As a result, the number of final USFS reports exceeds the number of V&V completed by one.

Abbreviation:

NA = not applicable

Accounting for the Total Number of DRUM Program Mines

The primary sources for estimating the potential number of mines in the DRUM Program are U.S. Atomic Energy Commission ore purchase records. The Report to Congress identified 4,225 mines from these records, counting each purchase record as an individual mine. The estimated total number of mines changes as more information is obtained. The DRUM Program has confirmed that duplicate (two or more) purchase records exist for many mines, resulting in an overestimation of the total number of mines. Aside from merging duplicate records, the team occasionally discovers additional previously unreported purchase records that are added to the total number of mines.

The current accounting of mines in the DRUM Program database for all types of land ownership is:

$$4,225 \text{ (Report to Congress)} - 948 \text{ (duplicates)} - 6 \text{ (deleted records)} + 315 \text{ (added records)} \\ = 3,586 \text{ mines currently in the database}$$

Additional V&V Progress – The Bigger Picture

The reconciliation process is conducted geographically based on mining district or land management agency boundaries. All mines in a geographic area are reconciled regardless of land ownership, leading to overall program efficiency as Campaign 2 (DRUM Program mines on tribal land) and Campaign 3 (DRUM Program mines on private property) are initiated. Table 4 and Table 5 present the V&V progress made so far for mines in each land ownership category. Including all mines regardless of ownership not only improves the efficiency of the reconciliation effort, but also ensures that all the mines are properly identified and that land ownership is confirmed.

As part of the public land V&V campaign, LM developed relationships and cooperative agreements with state AML programs in Colorado and Utah and with BLM in New Mexico to assist in performing the inventory task of V&V work. LM leveraged the state agencies' authority to inventory mines on state and private land because some mines are situated on both federal and private or state land. By using this cooperative approach to gain additional inventory information during the public lands campaign, LM efficiently improves completeness of the DRUM location data and is better positioned to develop and implement Campaigns 2 and 3.

Table 4. Bigger Picture V&V Progress for the Period January 1-June 30, 2020

Land Management Agency	Reconciliation Completed	Inventory Completed	Environmental Sampling Completed	Total V&V ^a Completed
Federal land management agencies	215	118	119	119
Private	27	0	0	0
Mixed	59	1	2	2
State	2	0	2	2
U.S. Bureau of Indian Affairs	0	0	0	0
Unknown	1	0	0	0
Merged duplicates	125			
	429	119	123	123

Notes:

^a Total V&V complete includes all mines visited where environmental sampling was completed, and mines field visited but where no environmental sampling was required (e.g., previously remediated mines or mine locations where there was no evidence of mining operations).

Table 5. Bigger Picture Cumulative V&V Progress Through June 30, 2020

Land Management Agency	Reconciliation Completed	Inventory Completed	Environmental Sampling Completed	Total V&V Completed ^a	Mines Remaining to V&V ^b	Mines Completed V&V ^c
Federal land management agencies	2,022	934	884	893	1,188	75%
Private	528	171	3	4	525	1%
Mixed	188	72	64	65	123	53%
State	84	39	29	29	55	53%
U.S. Bureau of Indian Affairs	83	0	0	0	417	0%
Unknown	1	0	0	0	287	0%
Merged duplicates	948					
	3,854	1,216	980	991	2,595	38%

Notes:

^a Total V&V complete includes all mines visited where environmental sampling was completed and mines field visited but where no environmental sampling was required (e.g., previously remediated mines or mine locations where there was no evidence of operations).

^b Mines remaining to V&V is the total number of reconciled and unreconciled mines that have not been field verified or removed as duplicates from the database.

^c Calculated by comparing the number of mines where V&V work is completed to those remaining to V&V.

Physical Hazards

Physical hazards are mining-related features that pose potential harm to human health or safety. Physical hazards are recognized as the primary risk at DRUM sites. Physical mining-related features that pose threats to human safety include open vertical mine entries (shafts, some vents, and subsidence features) as well as horizontal mine entries (adits and declines). In some instances, a remnant surface feature, such as a hazardous highwall, may pose a threat to human health. In order to protect the well-being of the public who visit DRUM sites, LM is teaming with partner land management and state AML agencies to construct safeguards at open mine entries. These safeguards will prevent human ingress to abandoned mines, while honoring the cultural and ecological value of the mines and their environments.

As the DRUM Program has evolved, it has become apparent that partner land management agencies prefer to safeguard all open mine entries rather than only high hazard mine entries. This trend toward safeguarding all open entries is a logical outgrowth of previously completed safeguard work experience. Safeguarding all open mine entries in a specific area during a single mobilization is a more cost-effective and time-efficient manner of completing this work.

During the reporting period, the DRUM Program identified approximately 537 hazardous mine features, which may require safeguarding. Cumulatively, approximately 1,643 hazardous mine features have been identified by the program at 543 mines.

Table 6 shows the number of mines with physical hazards by state and the estimated cost of safeguarding each hazardous mine feature. The estimated cost of constructing mine safeguards may be reevaluated following completion of the pilot mine safeguard projects set to begin in the fall of 2020.

Table 6. Mines with Potential for Safeguarding, Cumulative Through June 30, 2020^a

State	Mines Risk Screened ^a	Mines with Physical Hazards	Potential Features for Safeguarding	Total Costs for Safeguarding (\$ millions) ^b
Colorado	301	160	350	\$6.30
New Mexico	60	29	47	\$0.85
South Dakota	26	17	62	\$1.12
Utah	486	321	1,161	\$20.90
Wyoming	38	16	23	\$0.41
Total	911	543	1,643	\$29.57

Notes:

^a This includes all mines at which V&V work has been completed, regardless of land management or ownership status.

^b Total costs were calculated using the figure of \$18,000 multiplied by the number of potential features to be safeguarded.

LM has expanded its assistance to partner agencies to promote safeguarding physical hazards identified by the DRUM Program. LM will use existing relationships with land management agencies and state AML programs to accomplish safeguarding projects. LM has secured safeguard funding for FY 2021 and 2022 and anticipates a substantial hazardous mine feature safeguard program in conjunction with partner agencies in future years. Funding and scope have been added to existing cooperative agreements to provide for completion of safeguarding work. LM has added requests to its baseline budget to start safeguard construction in FY 2021, embarking on pilot mine safeguarding projects in Colorado and Utah in the fall of 2020. Lessons learned from these experiences will be used to help formulate a safeguard program management plan which will be produced in spring of 2021.

Human Health Risk and CERCLA Potential

The number of mines that could potentially move from the DRUM Program screening process to a CERCLA process is much lower than the number of mines that will require safeguarding of physical hazards. Land management agencies utilize their authority under CERCLA to address releases, or potential releases, of hazardous substances. Mines with a “high” or “medium” score for chemical or radiological risks could be further investigated by the land management agencies, potentially leading to CERCLA response actions. Of the 911 mines that have been risk screened to date, approximately 150 mines (16%) could require further analysis via the CERCLA process. However, the DRUM Program will further refine this assessment, with a potential outcome being that only mines that rank “high” for ease of access and suitability for camping (risk modifying factors) would potentially

move to the CERCLA evaluation process, thus reducing the population of mines potentially requiring future remediation. LM will collaborate with the respective land management agencies for concurrence on the final risk ranking methodologies. Table 7 shows the mines with a “high” or “medium” risk ranking for chemical or radiological hazards without applying the above-mentioned modifying factors and the potential costs.

*Table 7. Mines That Are Potential Candidates for Remediation (CERCLA)
Actions Cumulative, Through June 30, 2020*

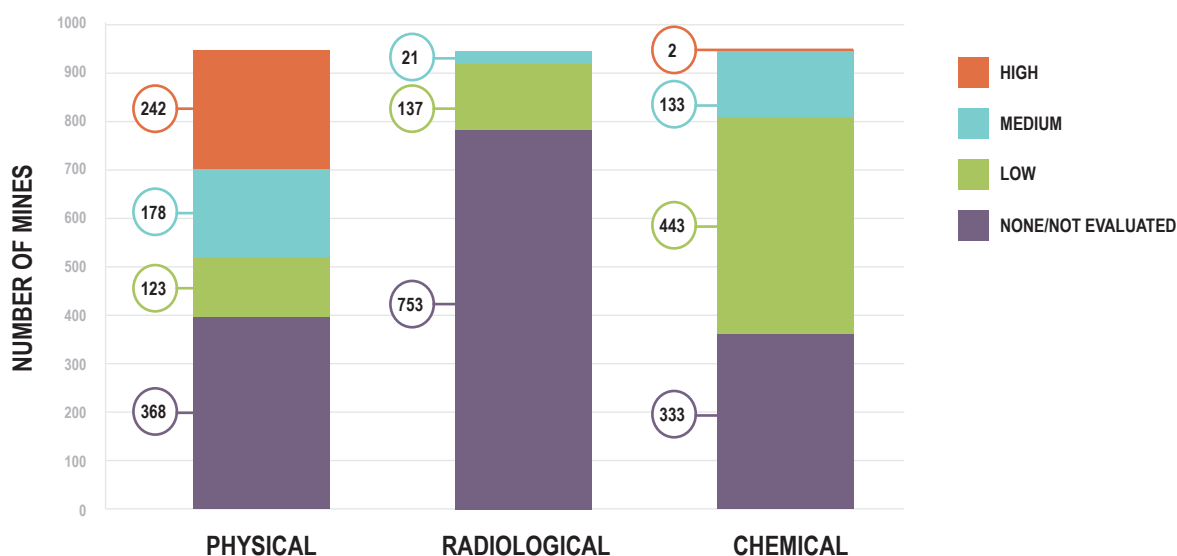
State	Mines Risk Screened	High Chemical Risk Rank	Medium Chemical Risk Rank	High Radiological Risk Rank	Medium Radiological Risk Rank	Potential CERCLA (Remediation Process)	Potential CERCLA (Remediation) Costs (\$ million) ^a
Colorado	301	0	28	0	4	32	\$42
New Mexico	60	0	3	0	0	3	\$4
South Dakota	26	0	0	0	0	0	\$0
Utah	486	2	93	0	16	111	\$144
Wyoming	38	0	3	0	1	4	\$5
Total	911	2	127	0	21	150	\$195

Notes:

^a The potential CERCLA cost of \$1.3 million per remediated mine was calculated using data from Table 4 in the DRUM Cost and Feasibility Topic Report.

Figure 1 below illustrates the rankings of mines for physical, radiological, and chemical risks. While “high,” “medium,” and “low” physical hazards will be considered for safeguarding activities, only mines with “high” or “medium” radiological and chemical risks will be considered for future remedial (CERCLA) work. Six mines were observed to exhibit a “high” or “medium” chemical risk and a “medium” radiological risk. Mines that exhibit both elevated chemical and radiological risks would be addressed during a single remediation construction event. To avoid overestimating the potential number remediations that may be considered, the six mines exhibiting dual risk factors were each considered as a single remediation event. As a result, 150 mines may be considered for future remedial (CERCLA) work.

Figure 1. Mine Physical, Radiological, and Chemical Risk Rankings



Agency Concurrence

The DRUM Program continues to work collaboratively to obtain partner agency concurrence on the final risk rankings for the evaluated mines. The concurrence process allows LM and partner agencies to initiate hazardous mine feature safeguarding projects. Therefore, concurrence is an important tool in safeguarding the public and wildlife from the inherent physical dangers posed by open mine features.

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