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Defense-Related Uranium Mines (DRUM) Safeguarding Program Management Plan

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This document is designed for online viewing.

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Abbreviations

AEC	U.S. Atomic Energy Commission
AML	abandoned mine lands
AUM	abandoned uranium mine
AUMWG	Abandoned Uranium Mines Working Group
BCI	Bat Conservation International
BIA	U.S. Bureau of Indian Affairs
BLM	U.S. Bureau of Land Management
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	*Code of Federal Regulations*
DOE	U.S. Department of Energy
DRUM	Defense-Related Uranium Mines
EC	environmental compliance
ECHO	Education, Communications, History, and Outreach
EMS	Environmental Management System
EPA	U.S. Environmental Protection Agency
FOIA	Freedom of Information Act
ISO	International Organization for Standardization
LM	Office of Legacy Management
LMS	Legacy Management Support
MOU	memorandum of understanding
NAAMLP	National Association of Abandoned Mine Land Programs
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPS	National Park Service
PL	Public Law
QA/QC	quality assurance/quality control
QMS	Quality Management System
SHPO	State Historic Preservation Office
SPgMP	Safeguarding Program Management Plan
USC	*United States Code*
USFS	U.S. Forest Service
V&V	verification and validation

Glossary

adit. A mine opening greater than 10 feet (ft) deep driven horizontally for the purpose of providing access to a mineral deposit.

attractive nuisance. A potentially hazardous object or feature that arouses curiosity to the point of enticing an individual into a potentially hazardous situation for the purpose of investigating the object or feature; features may include buildings and structures, adits or shafts, equipment, nearby springs or bodies of water shown on maps, or other attractions that could encourage an individual to spend time on a mine property.

closed. The egress condition of a single mine feature such as an adit or shaft with a barrier which prevents human access to the mine.

decline. A sloping, three-sided (two sides and a floor) excavation trending from ground surface elevation to a subgrade mine entrance.

disturbed area. The portion of the ground surface that is impacted by mechanical mining-related activities. The area includes mine entries, rim cuts, open pits, waste rock piles, topsoil, and overburden stockpiles. Roads providing access to mines and natural features such as ephemeral drainages are excluded from the disturbed area. Features associated with a mine, but which are separated from the disturbed area by undisturbed lands will be mapped as disparate, isolated portions of the disturbed area for purposes of completing the risk scoring assessment. Examples of such features may include vents, buildings, and waste rock piles.

drainage. A large-scale natural erosional feature present at a mine that existed before the mining disturbance (e.g., wash, ephemeral or perennial creek, canyon floor).

duplicate mine resolution. The resolution of duplicate mines is complete when two or more mines are reconciled into a single name and location. Irrelevant names and incorrect locations are removed from the Defense-Related Uranium Mines (DRUM) Program database. Merged duplicate records are documented using a certificate generated by the database titled the *Defense-Related Uranium Mines Program Verification and Validation Certificate of Completion: Merged Duplicates*.

ecological unit. A plant community that is distinct in terms of dominant species and successional stage from proximate communities within the mine disturbed area and surrounding undisturbed areas.

endangered species. Any species that is in danger of extinction throughout all or a significant portion of its range and that is protected by federal, state, or tribal statute.

engineered closure. A mine safety closure designed by a state or federal abandoned mine lands program or equivalent. The closure may have been installed by an abandoned mine lands program, a mining company, or other entities.

environmental sampling. A verification and validation (V&V) activity designed for the collection of soil, sediment, water, gamma radiation, or other environmental and ecological data at a mine.

environmental sampling completed. Environmental sampling at a mine is complete when the U.S. Department of Energy DRUM Program database is updated with field data collected by the Legacy Management Support contractor or obtained from an approved third party. V&V completion is documented when the database includes the date that field sampling occurred.

erosional feature. Small-scale erosion resulting in sediment transport of mined waste or disturbed soil from wind, water, or slope failure (e.g., rill, gully, unstable slope, soil piping, or sheet wash).

Field Operations Plan (FOP). A plan written to ensure that field teams are ready to perform their work as described in the appropriate campaign-specific V&V Work Plan before initiating field activities. FOPs are used to coordinate fieldwork and document that the necessary sampling and inventory preparations have been completed before deploying to the field. The FOP describes any deviation from the V&V Work Plan to the extent that such are anticipated before initiating environmental sampling work, lists the mines to be evaluated, describes the division of work tasks, identifies the inventory and environmental sampling responsibilities, and lists partner agency contacts and emergency response contact information.

habitat. A specific set of physical and biotic factors to which an individual, a species, or an ecological community is adapted.

hazard. A threat to physical safety of humans, the environment, or animals posed by conditions at a mine; something that can cause harm.

human use. Observable evidence of past and present human activity: Current activity might include mine inhabitation, recent campfire rings showing evidence of burning, or vehicle tracks, and past activity might include weathered foot or vehicle tracks, vegetative growth invading use areas, or relics such as weathered, discarded cans or trash. It is used in the context of the risk scoring assessment to partially describe degrees of mine occupancy.

inventory. A V&V activity designed primarily for the collection of observational data, such as the location of specific points or features at a mine. These geographic points may include the perimeter of the disturbed area, the crest and toe of a waste rock pile, or the location of a mine entry.

mine entry. A point at which people, wildlife, or materials can enter or leave an underground mine. Mine entries include adits and shafts but are not the same as ventilation raises meant for the intake or exhaust of mine air.

mine site location. A point at or immediately adjacent to a defense-related uranium mine from which most, if not all, mine features are visible.

mine size. Determined by the U.S. Atomic Energy Commission-documented quantity (tons) of uranium ore produced (DOE 1997). Mine sizes by production are as follows:

small mine = 0–100 tons of ore

small/medium mine = 100–1000 tons of ore

medium mine = 1000–10,000 tons of ore

medium/large mine = 10,000–100,000 tons of ore

large mine = 100,000–500,000 tons of ore

very large mine >500,000 tons of ore

needs maintenance. Status of a mine feature indicating that engineered abatement of physical hazards has been breached or otherwise damaged, and the engineering controls require maintenance to remain protective.

not addressed. Status indicating that no work has been conducted to reclaim or remediate the mine.

notifiable feature. A mining-related hazard that could pose a significant and immediate threat to a visitor who encounters such. Notifiable features may include subsidence areas, shafts, explosives, chemicals, or severely compromised structures.

open. The egress condition of a single mine feature such as an adit or shaft either without a barrier to human access or where underground mine workings may be observed from outside the mine without a safety closure being present.

operations not evident (ONE). Status of a reconciled mine location where no evidence of mining operations is apparent during completion of V&V activities.

physical feature. An excavation created for the purpose of exploring for, extracting, or developing an orebody and consequent openings in the ground surface which result from such activities. Examples of physical features include trenches, prospects, pits, shafts, adits, vents, and subsidences.

portal. A surface entrance to an adit.

potential wetland. An area with a vegetation type that is ecologically distinct from surrounding vegetation types because of surface water or shallow subsurface water. Potential wetlands are generally lusher and contain at least one wetland plant species (a plant classified as an obligate or facultative wetland species in the Arid West Region on the U.S. Army Corps of Engineers National Wetland Plant List).

prospect. A mine opening or excavation related to mining activities with a depth between 4 and 10 ft.

reclaimed. Mine description indicating that, in actions not performed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), waste rock or other portions of the mine, such as roads or ponds, have been recontoured or graded to a stable

condition. The primary purpose of these actions is to minimize the potential for future erosion and make items blend with the original site topography. This may include covering the site with enough topsoil to enhance revegetation. Unless otherwise noted in a FOP, complete V&V activities as described herein are conducted at reclaimed mines.

reconciliation. The process of evaluating mine location data, U.S. Atomic Energy Commission production records, and other pertinent information for the purpose of correlating a specific mine with a specific geographic location.

remediated. Mine description indicating that, in CERCLA actions, response actions have been taken or Action Memoranda signed to mitigate the release or potential release of a CERCLA hazardous substance. The primary purpose of these actions is to mitigate potential risks to human health and the environment. Such actions include, but are not limited to, consolidation areas or repositories.

rim cut. A mining technique in which uranium ore is removed by relatively shallow underground extraction methods. Mining follows the trend of the ore-bearing formation parallel with the outcrop and generally occurs at or near the top of a cliff or slope.

risk. Potential exposure to health or environmental hazards posed by conditions at a mine.

safeguard. An engineered barricade constructed for the purpose of preventing site visitors from approaching or accessing a mine or mine feature. Some state and federal abandoned mine lands agencies refer to safeguards as “mine safety closures.”

sediment shed. Earthen material transported from a disturbed area by aeolian or fluvial processes and subsequently deposited outside of the disturbed area of a mine.

shaft. A vertical excavation that provides access to an orebody, sometimes equipped with a hoist at the top that lowered and raised a conveyance for workers and materials at a mine.

shallow excavation. A horizontal or vertical excavation less than 4 ft deep which is associated with mining or exploration activities.

special-status species. Species listed as threatened or endangered or proposed for listing under the Endangered Species Act and species designated for special protection by states, tribes, and other agencies including the U.S. Bureau of Land Management and U.S. Forest Service.

structure. A building or building remnant originally constructed for the purpose of facilitating mining operations. Examples include former offices, ore bins and loadouts, standalone powder magazines, workshops, and equipment storage facilities.

subsidence. Downward deflection of the earth’s surface as a result of a roof (back) failure in an underlying mine. The result of subsidence may be a shallow trench, a vertical hole, or a broad downward deflection on the ground surface. The subsidence feature might or might not be open to the underground mine workings.

threatened species. Any plant or animal species likely to become endangered within the foreseeable future throughout all or a significant portion of its range and also protected by federal, state, or tribal statute.

trench. An excavation created for the purpose of exploring a potential ore-bearing formation. They are generally longer than wide and sometimes open at both ends.

utility task vehicle (UTV). Vehicle type that also includes off-highway vehicles and all-terrain vehicles that may engage in cross-country travel along roads not suitable for four-wheel-drive vehicles.

verification and validation (V&V). The DRUM Program process of verifying historic records and validating current mine conditions. Collectively, V&V work is the process of reconciling mine data, inventorying mine features, performing environmental sampling, and documenting results in a database and report that provides a risk scoring assessment to land management agencies.

waste rock. Materials associated with an orebody of interest which, due to their subeconomic value, are disposed of onsite. Waste rock may contain constituents of interest and may exhibit elevated gamma radiation and thus is a focus of the DRUM Program.

waste rock crest. The area of topographic transition of a waste rock pile from a relatively flat surface to a downward trending slope. Generally, the crest is at or near the top of the waste rock pile and is accessible for environmental sampling.

waste rock toe. The area of topographic transition of a waste rock pile from a downward trending slope to a relatively flat surface below the crest. Generally, the toe of a waste rock pile is at or near the base of the pile.

Executive Summary

The Defense-Related Uranium Mines (DRUM) Program Safeguarding Program Management Plan (SPgMP) provides the structure and basis for the U.S. Department of Energy Office of Legacy Management (LM) and its Legacy Management Support (LMS) contractor to manage safeguarding of mine-related physical safety hazards identified during field verification and validation (V&V) activities at DRUM sites. The SPgMP describes how LM, the LMS contractor, other LM contractors, and partner agencies will work as a cohesive team to execute safeguarding activities for the DRUM Program.

Safeguarding is the process of protecting the public from physical safety hazards posed by mining-related features at DRUM sites that DRUM Program field teams identified during V&V activities. Safeguarding involves construction of barricades to prevent public access to hazardous adits, shafts, subsidences, highwalls, and other excavated mine features. Safeguarding may, in limited cases, stabilize structures.

The scope and relative degree of the physical hazard presented by each mine-related feature are documented in risk roll-up reports (Campaign 1) or hazard summary reports (Campaigns 2 and 3). The DRUM Program prepares these reports for use by state and federal agencies or tribal abandoned mine lands programs in developing safeguard construction project parameters, such as project location boundaries and environmental reviews. The DRUM Program will perform very limited safeguarding work on mines on private property.

The DRUM SPgMP aligns with Goal 1 of the LM *Fiscal Year 2025–2035 Strategic Plan*,[1] "to protect human health and the environment." To achieve this goal, LM is partnering with state and federal agencies, tribal governments, and private landowners to implement the DRUM safeguarding program. As of 2024, LM has developed partnerships with the State of Utah School and Institutional Trust Lands Administration; the U.S. Forest Service national office; the National Park Service; the Navajo Abandoned Mine Lands Reclamation Department; the Colorado Division of Reclamation, Mining, and Safety; the Utah Abandoned Mine Reclamation Program; the Wyoming Department of Environmental Quality; and Bat Conservation International.

Safeguarding program activities on public land (Campaign 1) began in October 2020. A total of 1260 hazardous mining-related features have been safeguarded on public land in Colorado, Montana, New Mexico, Utah, and Wyoming as of December 31, 2024.

V&V fieldwork on tribal land (Campaign 2) began in August 2022, with 211 mines to be evaluated. Two hundred and one of the 211 Campaign 2 mines are within the Navajo Nation, and some but not all were reclaimed by the Navajo Abandoned Mine Lands Reclamation Department prior to the start of the DRUM Program. Under the Navajo Abandoned Mine Lands Reclamation Department, reclamation work included the safeguarding of mine-related hazardous features in addition to more traditional reclamation activities such as capping and reseeding waste rock piles. Because Campaign 2 V&V fieldwork is ongoing, the total number of reclaimed mines, number and status of safeguarded features, number of nonreclaimed sites, and number of hazardous mine-related features

[1] DOE (U.S. Department of Energy), 2025. *Fiscal Year 2025–2035 Strategic Plan*, DOE/LM-1500, Office of Legacy Management.

to safeguard are being determined. Campaign 2 V&V fieldwork is scheduled to be completed by September 30, 2026.

V&V fieldwork on private property (Campaign 3) began in March 2024 and is scheduled to be completed on a selected subset of mines by September 30, 2026. Plans for safeguarding activities on private property are currently under development by LM, the LMS contractor, and the partner agencies. All safeguarding operations are scheduled through September 2026. Appendix A presents an overview of the safeguard project development timeline and schedule.

1.0 Purpose

The Defense-Related Uranium Mines (DRUM) Program Safeguarding Program Management Plan (SPgMP) presents the U.S. Department of Energy (DOE) Office of Legacy Management's (LM's) and Legacy Management Support (LMS) contractor's implementation strategy for the DRUM safeguarding program. The SPgMP is the primary guiding document of the safeguarding program; it addresses collaborative interagency partnerships to facilitate safeguard design, environmental compliance (EC), construction activities, and documentation of hazard mitigation. The SPgMP is a living document and will be revised as necessary to accommodate efficient and effective completion of safeguarding activities.

The DRUM SPgMP supports LM's mission of protecting human health and the environment by addressing the human health and safety legacy of defense-related uranium mines (mines) by facilitating construction of safeguards at hazardous mine features.

The concepts outlined in the Project Management Institute's *A Guide to the Project Management Body of Knowledge (PMBOK Guide)* (PMI 2021) and *The Standard for Program Management* (PMI 2024) were considered in developing and updating this plan. These guides focus on the key concepts for successful program and project management with the most critical elements being thorough project planning and understanding the organization's influences and project constraints. Other key elements include clearly defining the project scope and mitigating project risks.

2.0 Introduction

LM is currently conducting screening-level verification and validation (V&V) field evaluations at sites in the DRUM Program's three campaigns: public land (Campaign 1), tribal land (Campaign 2), and private property (Campaign 3). Most of these sites are in Colorado, Utah, Arizona, New Mexico, and Wyoming, with a small number of sites in other states. Table 1 shows the distribution of V&V visits by campaign.

Table 1. Mines Identified for V&V Field Visits by Campaign as of January 2, 2025

Campaign	Land Ownership Type	V&V Field Visits	Start Date of V&V Field Activities	Scheduled Completion of V&V Field Activities[a]
Campaign 1	Public land	2354[b,c]	July 2017	December 31, 2024
Campaign 2	Tribal land	211[d]	August 2022	September 30, 2026
Campaign 3	Private property	658[b,c,d]	March 2024	September 30, 2026
Total V&V Field Visits		**3223**		

Notes:
[a] V&V field activities for Campaigns 2 and 3 will not occur beyond September 30, 2026, even if not all mines have been completed.
[b] Includes 139 public and private mixed-ownership sites.
[c] Includes one unconventional mixed-ownership site (Edna Mill Site [LM ID 6167]) visited by request.
[d] Includes one mine that is a public and tribal mixed-ownership site and one mine that is a tribal and private mixed-ownership site.

The screening-level V&V evaluations indicate that many mining-related physical features (e.g., adits, shafts, subsidences, and highwalls) may pose risks to the public. To mitigate these risks while preserving the historic significance and ecological resources of the affected mines, LM initiated the DRUM safeguarding program to be conducted in collaboration with federal land management agencies and state and tribal abandoned mine lands (AML) programs. The *Defense-Related Uranium Mines Program Management Plan* (DOE 2024b) provides a strategic outline to guide safeguarding of mining-related physical safety hazards identified during field V&V activities.

Generally, the physical safety hazards identified at DRUM sites include subsurface features such as adits, shafts, and subsidences. Other physical hazards include highwalls, trenches, and compromised mine-related structures. Safeguards, sometimes referred to as mine safety closures, are engineered barricades constructed at or near hazardous features to prevent human access to the subsurface or vertical ledges. In some cases, existing engineered safeguards on adits and shafts have been compromised either by natural forces or vandalism such that they present physical hazards despite having been previously closed.

The SPgMP describes the LM strategy for implementing safeguard construction at these sites where physical safety hazards were identified in order to protect the public. The strategy implements an efficient, cost-effective method by utilizing partnerships with federal land management agencies and state and tribal AML programs. These agencies have local knowledge, environmental expertise, understanding of priorities in the context of land management decisions, and the ability and experience to design, contract, and manage safeguard construction projects. In this and other DRUM Program documents, the LM mine safeguarding initiative is referred to as the "safeguarding program." Individual mine safeguard installation initiatives are referred to as "safeguard projects." Appendix A presents an overview of the safeguard project development, including timeline and schedule.

3.0 Background and Overview

3.1 Background

The U.S. Atomic Energy Commission (AEC) was created in 1946 by the Atomic Energy Act (Public Law 79-585 [PL 79-584]). The mines that are the focus of the DRUM Program have a production history that is generally limited to the period of 1947 to 1970, when uranium ore was sold to AEC for defense-related purposes.

The National Defense Authorization Act for Fiscal Year 2013 (PL 112-239) mandated that DOE prepare a Report to Congress on abandoned uranium mines (AUMs). The act additionally requires consultation with other relevant federal agencies, affected states and tribes, and the interested public.

In August 2014, LM submitted a report titled *Defense-Related Uranium Mines Report to Congress* (DOE 2014) (Report to Congress) that addressed the following:

- The location of mines on federal, state, and tribal land and private property and the status of efforts to remediate or reclaim these mines
- The extent to which these mines pose or may pose a significant radiation hazard or other public health and safety threat
- The extent to which these mines cause, or have caused, water contamination or other environmental degradation
- A priority ranking for the reclamation and remediation of these mines
- The potential cost and feasibility of reclamation and remediation in accordance with federal law
- The status of any mine reclamation and remediation efforts

After submitting the Report to Congress, LM helped found the Abandoned Uranium Mines Working Group (AUMWG), whose membership represented the following federal agencies: DOE, the U.S. Environmental Protection Agency (EPA), the U.S. Bureau of Land Management (BLM), the National Park Service (NPS), the U.S. Department of the Interior, the U.S. Forest Service (USFS), the U.S. Department of Agriculture, and the U.S. Bureau of Indian Affairs (BIA). The AUMWG collaboration determined that many unknowns (e.g., actual number, status, location, and ownership) still exist for mines on public land, tribal land, and private property. As a result, DOE entered into agreements with the various land management agencies to facilitate field V&V evaluations of DRUM Program mines. The purpose of these agreements is threefold:

- Facilitate DOE's capability to conduct field V&V evaluations of mines on public land, tribal land, and private property
- Evaluate and document potential hazards to human health and safety posed by mining-related features at the mines visited
- Mitigate risk to the public by safeguarding the physical safety hazards identified

This collaborative effort with partner agencies led LM to develop campaign-specific V&V Work Plans (DOE 2024d; DOE 2025b; DOE 2025c), describing the data collection procedures required to evaluate potential risks to the public and the environment while adding to the body of knowledge of the mines visited. Agency collaboration also contributed to the development of the DRUM risk screening process, including the evaluation of individual mine features and the creation of Campaign 1 risk roll-up reports and Campaign 2 and 3 hazard summary reports. V&V field operations and follow-up data analysis address the first two bullets above, while the safeguarding program addresses the third.

3.2 Overview

The DRUM Program's first goal was to complete field V&V activities on mines on public land (Campaign 1) by December 31, 2024, and as of this date, had completed field V&V activities on 2351 of 2354 mines, with the remaining three mines to be visited in 2025. The second goal is to complete V&V fieldwork on mines on tribal land (Campaign 2) by September 30, 2026, and the

third goal is to complete V&V fieldwork on a selected subset of mines on private property (Campaign 3) by September 30, 2026.

Campaigns 1–3 involve the following activities: (1) mine location and production data reconciliation; (2) field inventory and environmental sampling to screen for potential risks to public safety, human health, and the environment; and (3) reporting, which includes data management, risk evaluation, and report submission. Risk screening information is conveyed to partner agencies via individual mine reports, risk roll-up reports (Campaign 1), and hazard summary reports (Campaigns 2 and 3). The safeguarding of physical safety hazards identified during V&V activities and subsequently evaluated and documented in the risk roll-up and hazard summary reports is an extension of these activities.

Figure 1 shows how the safeguarding program aligns with the rest of the DRUM Program and how it will be managed through the SPgMP, and Figure 2 positions the safeguarding program within the overall DRUM Program timeline.

3.3 Program Authority

LM is authorized to conduct the DRUM Program by the following:

- National Defense Authorization Act for Fiscal Year 2013 (PL 112-239). DOE has the authority to undertake a review of AUMs that provided uranium ore for defense-related activities of the United States.
- Atomic Energy Act of 1954, as amended (Title 42 *United States Code* Section 2011 et seq. [42 USC 2011 et seq.]). DOE is authorized to protect public health and safety through its activities.
- The Department of Energy Organization Act of 1977 (PL 95-91, Stat. 565). DOE is established in the public interest and will promote the general welfare by assuring coordinated and effective administration of federal energy policy and programs.
- DOE is authorized to enter agreements with other federal agencies to complete its functions. Certain of these other agencies (e.g., BLM, NPS, and USFS) have authority under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 USC 9601 et seq.).

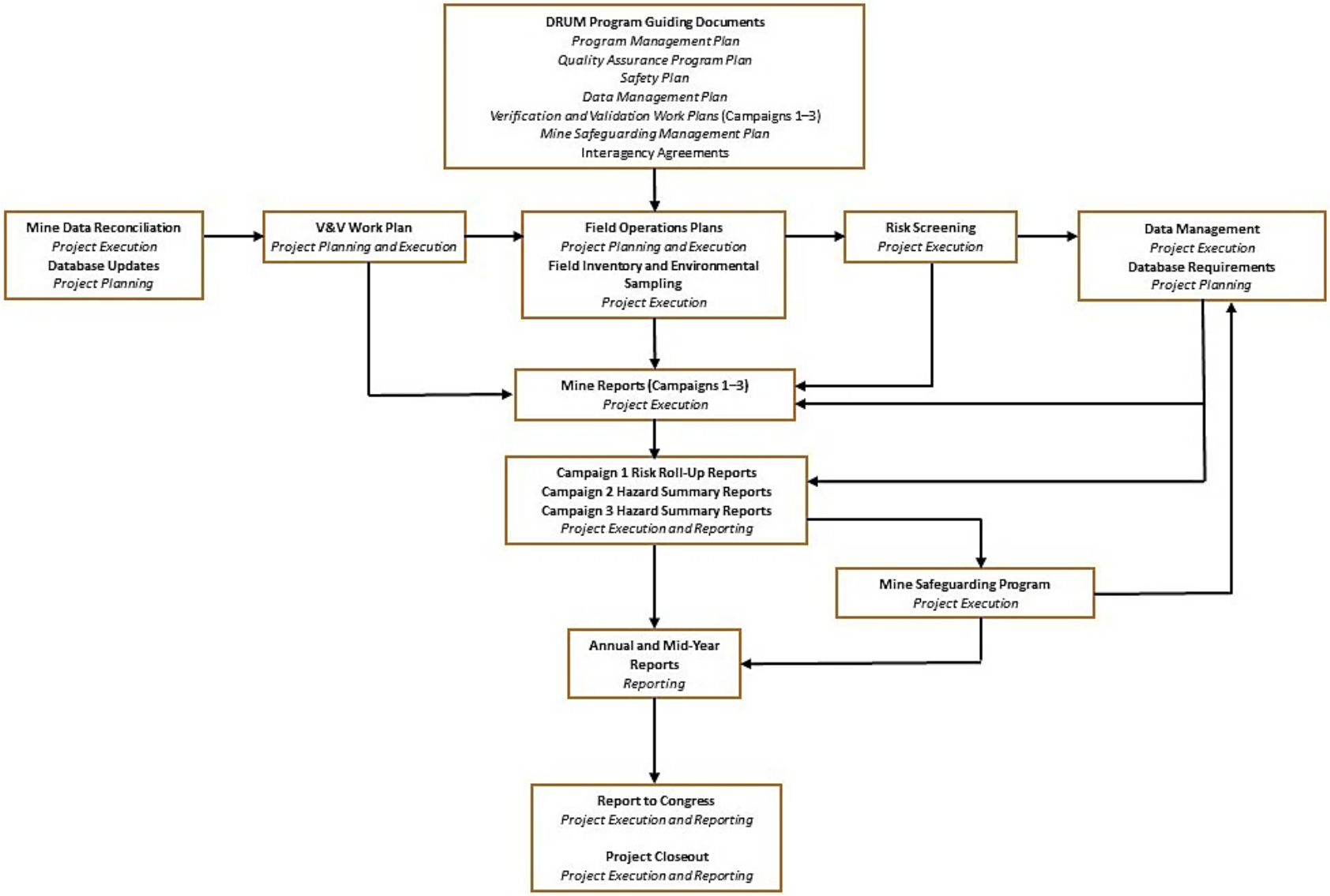
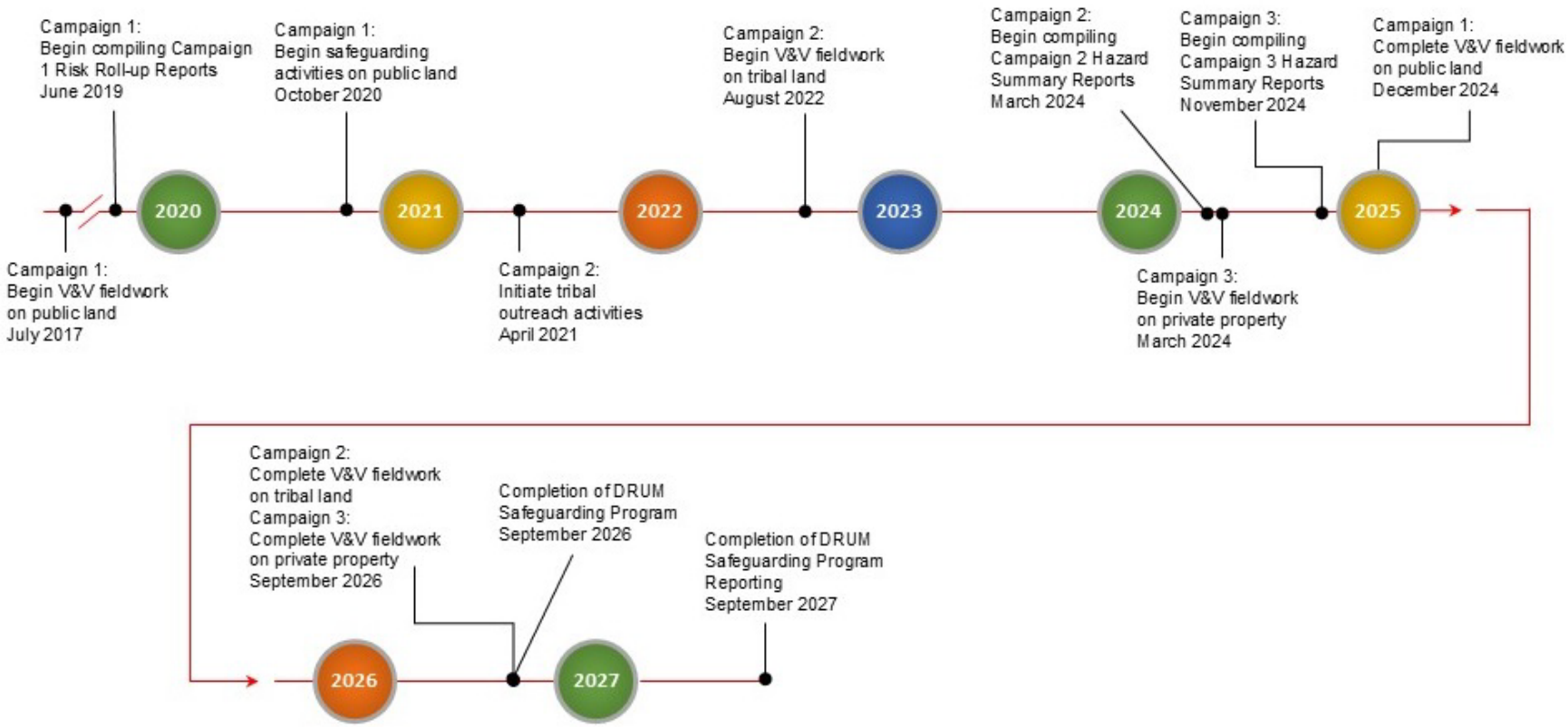


Figure 1. DRUM Program Flow Diagram



Note: V&V field activities for Campaigns 2 and 3 will not occur beyond September 30, 2026, even if not all mines have been completed.

Figure 2. DRUM Safeguarding Program Timeline

4.0 Safeguarding Program Goals and Objectives

The DRUM Program aligns with Goal 1 of the LM *Fiscal Year 2025–2035 Strategic Plan* (DOE 2025f) (Strategic Plan), "to protect human health and the environment." The DRUM Program's mission directly supports this goal by completing a multiphased approach to screening abandoned defense-related uranium mines, evaluating potential mine-related risks and hazards, and developing plans to protect the public from those risks and hazards.

To this end, the DRUM Program currently employs, or will employ, numerous strategies to fulfill its mission and meet Strategic Plan challenges, including the following:

- Work collaboratively with other federal agencies and state and tribal governments to exchange mine information and leverage resources to address land management concerns
- Close data gaps and improve data quality and content in DOE's inventory of AUMs by completing location and production record reconciliation
- Collect site-specific data at each mine, including inventory and environmental sampling, to identify safety hazards or the potential release of contaminants
- Conduct site-specific screening-level evaluations, relative scoring, and ranking of mine risks and hazards
- Document the results of site-specific evaluations of potential risks and hazards
- Improve the data quality and content of the DRUM Program database and agency databases
- Provide federal, tribal, and state land management agencies and private landowners with risk roll-up reports (Campaign 1) or hazard summary reports (Campaigns 2 and 3) documenting and prioritizing the risks and hazards identified during V&V field visits and presenting potential safeguarding actions

The overarching goal of the safeguarding program is to protect the public from physical safety hazards at DRUM sites by accomplishing the following objectives:

- Restrict human access while conserving ecological habitat to the extent possible
- Construct physical barriers at hazardous entries to underground mines and at dangerous mining-related highwalls
- Accomplish safeguarding in a manner that protects cultural and ecological resources by complying with all relevant federal, state, tribal, and local laws and regulations
- Complete safeguarding in a collaborative manner that maximizes effectiveness and utilization of expertise

5.0 Safeguarding Program Collaborative Approach

In order to execute the safeguarding program goals and objectives most effectively, LM will collaborate with partner agencies during all aspects of program organization and implementation, including the following:

- Funding
- Scheduling
- Risk assessment and partner agency concurrence
- EC documentation
- Contracting and construction
- Notification of hazard mitigation
- Safeguard projects on private property

LM's safeguarding program incorporates data collected during V&V activities and leverages existing resources provided by LM, the LMS contractor, land management agency partners, and state and tribal AML programs. LM will rely on Bat Conservation International (BCI) to implement project-specific tasks when partner agencies are unavailable.

5.1 Collaborative Partnerships

As the basis for these collaborative partnerships, LM has developed the following agreements:

- A Cooperative Agreement with the Colorado Division of Reclamation, Mining, and Safety
- A Cooperative Agreement with the Utah Abandoned Mine Reclamation Program
- A Cooperative Agreement with the Navajo Abandoned Mine Lands Reclamation Department
- A Cooperative Agreement with BCI

LM recognizes that partner agencies have multiple responsibilities, limited resources, and competing priorities. Therefore, the project organization and implementation processes described herein are designed to be flexible, which is possible given overlap in expertise, resources, capabilities, staffing, and task management options. As a partner agency's ability to commit resources changes over time, the capability to cross-utilize resources on a project-specific basis allows them to participate to varying degrees and capacities.

Figure 3 describes the capabilities that the partners involved in the safeguarding program provide, and Figure 4 illustrates safeguard project organization and implementation.

Abbreviation: NEPA = National Environmental Policy Act

Figure 3. Collaborative Partnership Capabilities

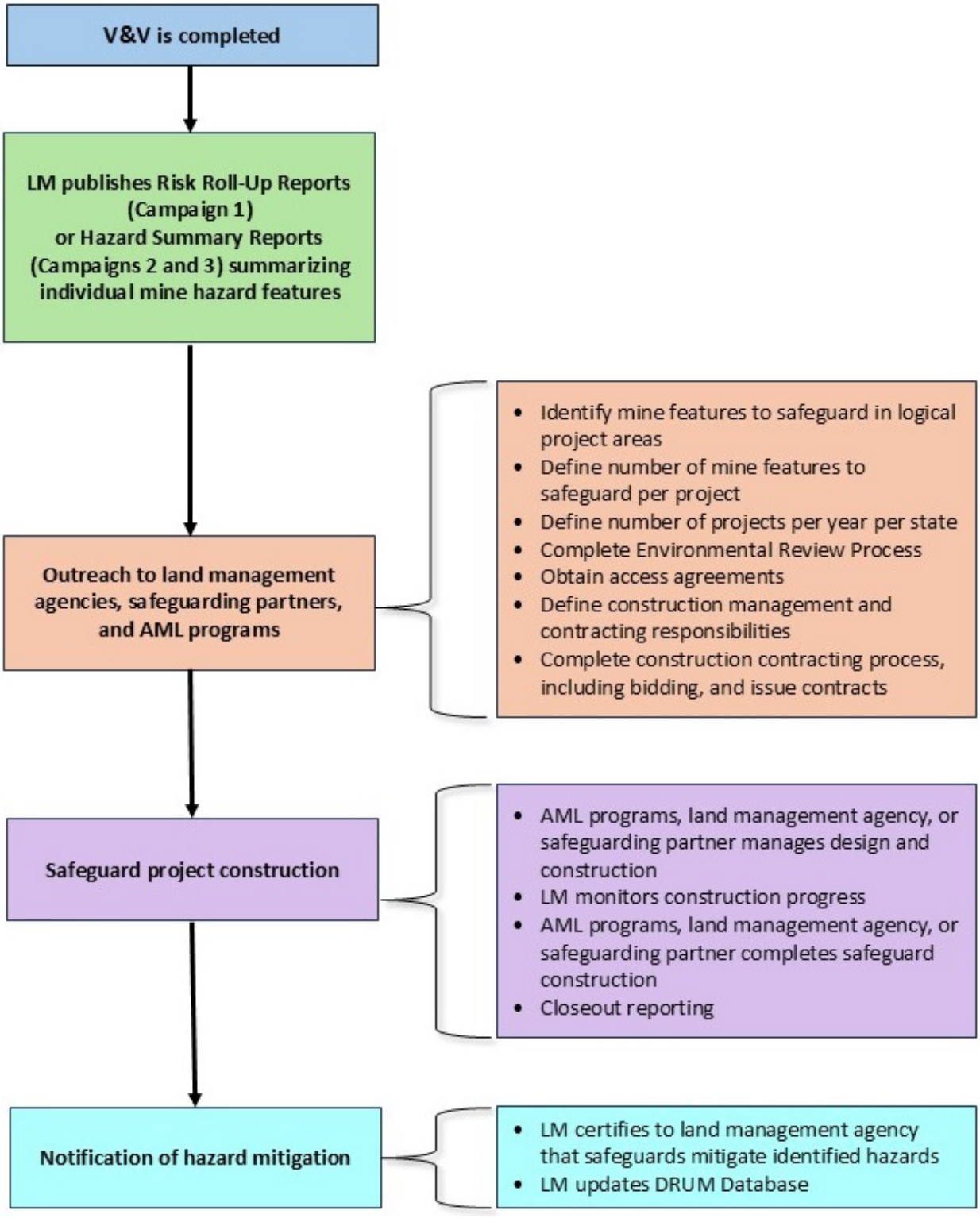


Figure 4. Typical Safeguard Project Flow Path

5.1.1 Funding and Timeline

LM is committed to funding the safeguarding program through September 2026, via the aforementioned agreements with partner land management agencies and state or tribal AML programs, which may in turn provide matching funds or in-kind resources consistent with the flexible nature of the partnership agreements.

5.2 Safeguard Project Organization

Project organization describes preconstruction activities and tasks coordinated by LM and completed by partner agencies as described in the following subsections.

5.2.1 Risk Assessment and Partner Agency Concurrence

LM evaluates the risk posed by individual mining-related physical hazards based on data collected during field V&V activities. These evaluations are summarized in risk roll-up reports (Campaign 1) and hazard summary reports (Campaigns 2 and 3) and provided to partner land management agencies to document and prioritize hazards prior to initiating safeguarding activities. LM subsequently works with partner land management agencies to secure concurrence with the physical hazard assessment, and concurrence in turn triggers safeguard preconstruction activities.

5.2.2 Prioritization

Given the number and variety of hazardous mine features identified during field V&V activities, safeguard project completion is prioritized according to the following variables:

- Partner agency goals and objectives
- Number and severity of mine-related physical hazards in a geographic area
- Timing of land management agency concurrence with LM findings
- Availability of partner agency and state and tribal AML program staff
- Ability to complete environmental reviews and associated National Environmental Policy Act (NEPA) documentation within a defined time period
- Ability of the purchasing organization to process contracting documents within a defined time period
- Availability of partner agency and state and tribal AML program matching funds or in-kind services

LM strives to prioritize safeguard projects in consultation with land management agencies before initiating environmental reviews in order to establish a time-dependent list of project priorities. Ideally, all identified physical hazards will be safeguarded. However, if sufficient funding is not available, an evaluation of the degree of risk each individual feature poses may be undertaken in consultation with partner agencies to prioritize safeguard projects.

5.2.3 Location Delineation

LM may define the physical boundaries of a safeguard project area in conjunction with partner agencies. Safeguard projects will be organized geographically in order to (1) facilitate efficient access by construction contractors, (2) allow all hazards within a project area to be addressed in a single mobilization, and (3) facilitate follow-up administration by the affected land management agency. Safeguard project locations will be identified in advance to allow adequate time to complete all administrative tasks, including environmental reviews, project design, and safeguard construction procurement.
Risk roll-up reports (Campaign 1) and hazard summary reports (Campaigns 2 and 3) are a logical starting point for delineating safeguard project areas. Other factors that may be considered when defining safeguard construction project boundaries include the following:

- Proximity of mines to one another
- Watershed boundaries
- Mining district boundaries
- Ranger district boundaries
- BLM field office boundaries
- NPS, wilderness, or other restricted use area boundaries
- Tribal boundaries
- Private property boundaries
- Proximity of concurrent state or tribal AML projects
- Partner agency funding opportunities

The number of mine features to safeguard in a project area may be influenced by construction costs, common land management administration, and timing limitations such as seasonal closures due to wildlife or other environmental considerations.

5.2.4 Preconstruction EC Review

NEPA (42 USC 4321 et seq.) requires an EC review and documentation for any action on federal land, any federally funded action, or any federal decision with impacts to the environment. EC reviews determine the required level of NEPA documentation, as well as other federal, state, and local environmental requirements, including National Historic Preservation Act (NHPA) (54 USC 300101 et seq.) and Endangered Species Act (16 USC 1531 et seq.) consultation. EC reviews ensure that cultural, ecological, and natural resources are protected during safeguard project construction. Completing required EC reviews in advance of safeguard construction planning and specification development ensures that protections are implemented most effectively.

The federal agency taking the safeguarding action or making the decision must conduct and document the environmental review. Information from partner agencies' NEPA documents may be used, as appropriate, in DOE's NEPA evaluations for DRUM safeguarding actions. DOE is responsible for completing all reviews for actions on state land, tribal land, and private property.

NEPA responsibilities will be determined well in advance of scheduled construction. Section 10.0 provides additional information on EC requirements.

Safeguard project EC considerations include the following:

- Coordinate construction with plant or wildlife conservation restrictions
- Include avoidance and mitigation measures whenever possible
- Design safeguards to be consistent with identified resource concerns (e.g., bat habitat)
- Incorporate environmental permit conditions in construction specifications
- Include environmental consultation-related conditions in construction specifications
- Align revegetation materials and practices with land management agency practices
- Thoughtfully design and execute work near historical structures and features
- Accommodate compliance requirement tracking

5.2.5 Safeguard Design

Safeguard designs must be customizable for use in varying conditions and circumstances. State and tribal AML programs and some land management agencies have developed safeguard designs that have proven to be versatile, effective, and durable. Using existing safeguard designs has many benefits, including the following:

- Saves design time and budget
- Adapts to unique site conditions
- Allows for clear, concise project specifications
- Provides bidding efficiencies because contractors are familiar with materials and installation
- Creates construction management efficiencies
- Allows for implementation of best practices where no design standard is applicable

In addition, LM will adapt and accept existing state, tribal, or land management agency AML program safeguard construction specifications as design standards.

Safeguard construction will adapt to compliance requirements specified for a given hazardous mine feature. For instance, wildlife-friendly safeguards will be constructed at locations where habitat is known or suspected. Table 2 describes typical safeguard project types, their attributes, and other safeguard construction considerations.

Table 2. DRUM Safeguard Project Types and Attributes

Safeguard Type	Safeguard Description	Feature Type	Equipment	Potential Repair of Existing Needs Maintenance Safeguards	Closure Type Advantages	Closure Type Disadvantages	Worker Safety Considerations
Grate	Steel bars configured in a grid across mine entry	Adit, shaft, vent, subsidence	Welding equipment, handheld drill, small track excavator, concrete mixing equipment	Repair of vandalized bars or attachment points	Can be modified for many hazard circumstances; accommodates wildlife habitat	Relatively expensive to construct; does not mitigate potential radon emissions	Work under the brow inside mine entry; potential radiation and rockfall hazards
Polyurethane foam with backfill	Pour-in-place structural foam covered by earthen backfill to ground surface	Adit, shaft, vent, subsidence	Polyurethane foam mixing equipment, hand tools, small track excavator	Repair of safeguard subsided into underlying mine feature	Low maintenance requirements; relatively inexpensive	Feature may be open below base elevation of foam, creating subsidence potential; does not accommodate wildlife habitat	Work adjacent to vertical features
Backfill	Placement of earthen material within feature	Adit, shaft, vent, subsidence	Hand tools, small track excavator	Repair of void created by settled backfill	Complete filling of vertical features; substantial filling of horizontal features; inexpensive	Potential for backfill to settle over time; does not accommodate wildlife habitat	Initial work is conducted under the brow inside mine entry or adjacent to vertical features
Bulkhead	Block wall constructed inside mine entry	Adit	Hand tools, small track excavator, mortar mixing equipment	Repair of breached bulkhead materials	Can fit most adit conditions; can be modified to accommodate wildlife habitat; relatively inexpensive	None	Work under the brow inside mine entry; potential radiation and rockfall hazards
Fence	Steel or barbed wire fencing constructed adjacent to a hazardous feature	Highwall, trench, subsidence	Small track-mounted or handheld drill, hand tools, welding equipment, concrete mixing equipment	Repair of cut or failed fence	Relatively expeditious	Moderately expensive; relatively susceptible to vandalism	Work adjacent to vertical features

5.2.6 Safety Considerations

Safety of personnel responsible for safeguard installation is a paramount consideration during safeguard design and construction. National safety protocols for government agency personnel and their contractors at abandoned mines have not been established. However, some state and tribal AML programs have established safety criteria for their staff and safeguard installation contractors. Therefore, LM, the LMS contractor, and other LM contractors will follow established state and tribal AML program protocols when those offices contract and manage safeguard construction activities.

Generally, safeguard construction project health and safety protocols address both surface and underground circumstances. LM and LMS personnel do not work underground and therefore follow surface safety protocols. However, when program staff and their contractors work on the surface and underground, they will follow both surface and underground protocols. Partner organization and contractor personnel working at DRUM sites under or inside a mine opening or brow or belowground independently accept responsibility for their actions, and their acceptance of independent responsibility will be documented in agreements and contracts. Section 12.0 addresses safety and health plans and procedures in greater detail.

5.2.7 Contracting

Partner land management agencies, state and tribal AML programs, or BCI may contract safeguard construction. Because safeguard construction contracting is time consuming, contracting timelines must be factored into preconstruction planning and construction project schedules.

Safeguard construction contracts are project-specific. However, safeguard construction contracting will utilize existing contracting systems and contract language with modifications as necessary. Standard contract language provides guidance for construction performance, contractor and owner relationships and responsibilities, management of changes in working conditions or specifications, holding and releasing performance bonds, and courses of action and remedies in case of contractual disputes.

5.2.8 Safeguard Project Organization on Private Property

For mine features on private property, LM provides funds, oversight, and administrative functions to implement individual safeguard projects efficiently and effectively. Generally, these mine features will be addressed in conjunction with safeguard projects on public land; however, federal land management agencies will not be involved. Table 3 describes primary and secondary organizational responsibilities for safeguard project implementation tasks on private property.

Table 3. Organizational Responsibilities for Safeguard Projects on Private Property

Task	Primary Responsibility	Secondary Responsibility
Landowner consent	State or tribal AML program	Nonprofit organization
Preconstruction EC review	State or tribal AML program	LMS contractor
Safeguard design	State or tribal AML program	Nonprofit organization
Contracting	State or tribal AML program	Nonprofit organization
Construction project management	State or tribal AML program or nonprofit organization	State agency or nonprofit organization

Obtaining landowner consent is required for safeguard construction at private features and constitutes an additional preconstruction task. Many state AML programs have a consent process that includes indemnification for the contractor and contracting agency. When required, the consent document is attached to the property title and recorded with the appropriate county clerk.

5.3 Safeguard Project Implementation

Project implementation refers to individual safeguard construction projects through postconstruction project closeout. This section includes an overview of typical individual safeguard construction projects described in Table 2, construction project management responsibilities, key construction safety considerations, and quality assurance sampling.

5.3.1 Safeguard Construction

A single organization will be responsible for project management of any given safeguard construction project to ensure consistency in contract implementation and construction quality. This single organization will be responsible for all aspects of the project from contract award to final acceptance of the completed safeguards.

Construction project management includes the following five responsibilities:

1. Ensure that each safeguard is constructed to design specifications
2. Ensure contractor compliance with all contract requirements, including EC and safety considerations
3. Evaluate requested changes to design specifications and commensurate cost changes
4. Accept or require modification of completed safeguards
5. Approve payment for successfully completed safeguards

The agency responsible for safeguard construction project management will provide an on-the-ground project manager. The project manager is responsible for communicating project progress and ensuring that all work is performed to design specifications in compliance with contractual obligations.

5.3.2 Construction Safety Considerations

This section and Section 12.0 describe safety requirements and documents that govern safeguard project safety protocols within the safeguarding program's collaborative approach. Contracting organizations require construction contractors to adopt these health and safety protocols, key components of which address the following:

- Surface safety
  - Gamma radiation
  - Heavy equipment operation
  - Rockfall associated with excavated highwalls
  - Dust inhalation
  - Noise in the work zone
  - Unstable structures
  - Incident prevention
  - Incident reporting
- Underground safety
  - Alpha radiation
  - Radon
  - Subsurface atmospheric conditions (gases, barometer)
  - Mine back and rib stability
  - Dust inhalation
  - Noise in the work zone
  - Incident prevention
  - Incident reporting

5.3.3 Evaluation of Safeguards for Quality Assurance

LM will maintain a quality assurance presence during safeguard construction to ensure that the highest quality safeguards are consistently constructed. Safeguards under construction will be evaluated at previously identified critical construction points to ensure that the quality and resultant integrity of constructed safeguards meet project specifications. LM will evaluate a limited subset of features safeguarded during each project. Reports of the quality assurance findings will be provided to the agency or contractor responsible for construction project management. The agency or contractor responsible for construction management will ensure that any deficiencies noted by LM are remedied at all affected safeguards.

5.4 Postconstruction Project Closeout

The agency or contractor responsible for construction project management will notify LM that it has accepted all constructed safeguards at the completion of each project. This safeguard project closeout indicates that the agency or contractor responsible for construction project management has evaluated the installation of each safeguard and certifies that each safeguard meets project specifications and expectations. The notification to LM will include a list of each hazardous mine feature safeguarded, the corresponding LM identification number, the type of safeguards installed, and the final cost of each safeguard installed.

5.4.1 Notification of Hazard Mitigation

Unless the LM quality assurance oversight detects substantial uncorrected issues with the safeguard construction process, LM will accept the safeguards as complete. LM will update the hazard status of individual safeguarded mine features in the DRUM Program database and notify the appropriate land management agency of project completion and physical hazard mitigation.

6.0 Safeguarding Program Administration

In addition to involvement in interagency communications, partner agency concurrence, and safeguard project development, design, and construction, LM will actively participate in all program administrative tasks, including cost administration, safeguard project acceptance, and notification of hazard mitigation, as described in the following subsections.

6.1 Cost Administration

LM will provide funding to land management agencies and state and tribal AML programs using agreements describing tasks, responsibilities, and project costs (see Section 5.1). Cooperating agencies will report progress, accomplishments, and expenditures to LM as described in these agreements following stablished federal practices. LM will track costs and expenditures.

6.2 Safeguard Project Acceptance

The contracting partner responsible for safeguard project construction will notify LM when each safeguard project has been completed, ensuring that any LM quality assurance issues have been addressed (see Section 5.3.3). This oversight process ensures that LM and partner agencies are mutually assured that constructed safeguards meet design specifications and that safeguard project goals are accomplished.

6.3 Notification of Hazard Mitigation

Following partner agency acceptance of constructed safeguards, LM will complete a safeguard closeout report documenting the mitigation of hazards identified during V&V activities and tabulated in risk roll-up or hazard summary reports. The closeout report will be in spreadsheet format for presentation to the appropriate partner agency. LM will complete and issue similar reports following construction at existing safeguards requiring maintenance. In conjunction with

closeout reporting, LM will update the DRUM Program database. Section 9.0 describes reporting in more detail.

LM anticipates that affected land management agencies will concur that the completed safeguards have mitigated the hazards identified in risk roll-up and hazard summary reports, and that notification of hazard mitigation will terminate DOE involvement at those features.

7.0 Education and Outreach

The hazards and risks associated with AUMs provide opportunities for safety-related public service messaging to local communities. The National Association of Abandoned Mine Land Programs (NAAMLP) and state and federal AML programs have organized and participated in the nationwide "Stay Out Stay Alive" campaign. The safeguarding program provides an opportune moment to expand educational efforts by emphasizing the unique issues associated with AUMs. Community outreach during safeguard project planning may include participation in or organization of the following:

- Public scoping meetings
- County commissioner meetings
- Tribal council meetings
- Public service announcements
- School presentations
- Historical interpretive signs
- Signage at project areas

The DRUM Program's unique objectives afford a variety of opportunities to exchange technical information with other mining-industry professionals and organizations, including the following:

- Presenting papers at conferences
- Publishing papers in journals
- Actively participating in AUMWG and NAAMLP
- Maintaining an active website
- Facilitating relationships with historical preservation organizations

8.0 Safeguarding Program Organization

The DRUM Program structure defines the organizational elements used to plan and implement the safeguarding program. BLM, USFS, NPS, state and tribal AML programs, and private and nonprofit organizations provide support to the safeguarding program. The following subsections describe these agencies and organizations and their respective roles.

8.1 Office of Legacy Management

LM is a DOE Headquarters office managed from Washington, D.C.; Grand Junction and Westminster, Colorado; and Morgantown, West Virginia. The safeguarding program operates out of the LM Field Support Center at Grand Junction, Colorado, and is managed by the Uranium Mine Team supervisor, who is responsible for program and project management, contractor oversight and performance evaluation, interagency coordination, and overall DRUM Program success. The LM Uranium Mine Team consists of federal employees and contractors who directly support the DRUM Program. The team works collaboratively to define and accomplish program goals to ensure program success.

8.2 LMS Contractor

The LMS contractor supports LM by executing the safeguarding program aspects of the DRUM Program administered by the DRUM subtask. The LMS lead for the safeguarding program is the Uranium Related Programs manager, who is supported by direct staff and mission support personnel from the following organizations: Data Management; Environmental Compliance; Quality Assurance; Education, Communications, History, and Outreach (ECHO); and Records Policy and Program.

8.3 Partner Agencies

Partner agencies, including state and tribal AML programs, have various roles within the safeguarding program. LM engages these agencies through agreements and memoranda of understanding (MOUs), which define general roles and responsibilities (see Section 5.1). Land management agencies also support DRUM safeguarding efforts via their enabling legislation. LM collaborates with partner agencies to develop safeguard projects and scope and to define work tasks and schedules. LM provides direction to partner agencies, and partner agency management in turn provides direction to their respective staff to execute the work.

8.3.1 State and Tribal Agencies

LM's Cooperative Agreements with some state AML programs facilitate activities and funding to initiate and complete safeguard projects. LM will establish agreements with additional state and tribal AML programs as the safeguarding program initiates activities in affected areas.

Some state and tribal AML programs have preexisting administrative agreements with partner land management agencies (e.g., USFS and BLM). These agreements provide funding mechanisms and a general scope of responsibility for abandoned mine feature safeguarding and may be used to facilitate DRUM feature safeguarding on certain public lands.

8.3.2 U.S. Bureau of Land Management

BLM state offices are the primary contacts for safeguarding efforts on BLM-managed public land. BLM state offices and subsidiary field offices will work with LM to provide mine feature hazard priority concurrence, support for environmental reviews, NEPA documentation,

safeguard construction activity input, and safeguard construction access coordination. BLM authorities that support the safeguard program include the following:

- The Federal Land Policy and Management Act of 1976 (43 USC 1701 et seq.). BLM has broad authority to manage public land and to protect public health and welfare from risks associated with abandoned mines on these public lands. BLM is authorized to enter into agreements with other federal agencies to carry out its responsibilities.
- The Surface Resources Act of 1955 (30 USC 611 et seq.). BLM has broad authority to address an abandoned mine opening on an active mining claim staked after 1955 provided the proposed safeguard work does not endanger or materially interfere with actual, established prospecting, mining, or processing operations or reasonably incidental uses. BLM is authorized to take steps to protect public safety and prevent further unnecessary and undue degradation caused by abandoned mines. BLM has the governing NEPA responsibility and authority for mines on BLM land and will determine the need for NEPA evaluation.

8.3.3 U.S. Forest Service

The USFS national office is the primary contact for safeguarding efforts on National Forest System land. The national office facilitates LM's interaction with USFS regional and district offices to provide mine feature hazard priority concurrence, support for environmental reviews, NEPA documentation, safeguard construction activity input, and safeguard construction access coordination. USFS authorities that support the safeguarding program include the following:

- The Federal Land Policy and Management Act of 1976. USFS has broad authority to manage the National Forest System and to protect public health and welfare from the risks associated with abandoned mines on these public lands. USFS is authorized to enter into agreements with other federal agencies to carry out its responsibilities.
- The National Forest Management Act of 1976 (PL 94-588). USFS has broad authority to restore the land disturbed by historic mining activities and to protect public safety from the risks associated with abandoned mines on these public lands. USFS has the governing NEPA responsibility and authority for mines on National Forest System land and will determine the need for NEPA evaluation.

8.3.4 National Park Service

The NPS Intermountain Regional AML coordinator will be the primary contact for safeguard efforts on NPS public land (i.e., national park units). The NPS Natural Resource Stewardship and Science Directorate Geologic Resources Division as well as individual park units work with LM to provide mine feature hazard priority concurrence, support for environmental reviews, NEPA documentation, safeguard construction activity input, and safeguard construction access coordination. NPS authorities that support the DRUM Program include the following:

- The National Park Service Organic Act (54 USC 100101 et seq.). NPS has broad authority to manage public land and to protect public health and welfare from risks associated with abandoned mines on national park units. NPS is authorized to enter into agreements with other federal agencies to carry out its responsibilities. NPS has the governing NEPA responsibility and authority for mines on national park units and will determine the need for NEPA evaluation.

8.3.5 Other Agencies

LM and nonprofit organizations will work with federal, state, or tribal agencies to facilitate safeguarding program tasks. In some instances, these and other federal, state, and tribal agencies may provide input on the environmental review process, NEPA documentation, construction, or other contract support. As described in Section 5.0, collaboration with other agencies with expertise and knowledge promotes an efficient one-government approach to program and project management.

8.3.6 Abandoned Uranium Mines Working Group

The AUMWG federal agencies, led by LM, include DOE, EPA, BLM, the U.S. Department of the Interior, USFS, the U.S. Department of Agriculture, BIA, and NPS. The AUMWG agencies use a coordinated approach to share expertise, exchange technical and administrative information, and leverage resources to address problems posed by AUMs. The *Abandoned Uranium Mines Working Group Addressing Health and Safety Risks of Abandoned Uranium Mines Multiagency Strategic Plan* (AUMWG 2024) calls for the physical inventory, assessment, safeguarding, reclamation, and remediation of those AUMs posing the greatest risks to human health, physical safety, and the environment. At the end of fiscal year 2025, the function of the AUMWG will be absorbed into a broader federal committee.

9.0 Reporting

The safeguarding program's reporting functions track milestones and document program achievements. Project-specific reporting is completed by the safeguard project contracting agency and is provided to LM monthly during the life of each project. LM reporting requirements include the following.

9.1 Status Reporting

LM and the LMS contractor report safeguarding program progress and project status to partner agencies and programs in monthly meetings and teleconference calls. These updates address programmatic issues, safeguard project planning and scheduling, environmental review preparation, and construction activities. Section 14.2 provides additional information regarding general program communication with partner agencies and private landowners.

9.2 Project Closeout Reporting

Project closeout reports are prepared within 90 days of completion of each safeguard project. The report may simply communicate that all safeguarding was performed as described within the corresponding environmental analysis.

9.3 Annual Reporting

As part of the DRUM annual report, LM provides a summary of safeguarding program activities and achievements for a specific calendar year. The annual report also accounts for changes to the DRUM Program database as hazardous features are safeguarded. Details will also be highlighted in AUMWG's annual stakeholder report.

10.0 Environmental Compliance

LM conducts environmental protection under the umbrella of the Environmental Management System (EMS) managed jointly by LM and the LMS contractor. The EMS conforms with International Organization for Standardization (ISO) 14001:2015, *Environmental Management Systems—Requirements with Guidance for Use*, and mandates compliance with applicable environmental regulations to ensure that air, water, land, and other natural and cultural resources are protected. The EMS is described in the *Environmental Management System/Energy Management System Description* (DOE 2024f) and integrated with the LMS contractor's *Integrated Safety Management System Description for LMS in Support of DOE Legacy Management Sites* (DOE 2024g).

Beyond the broad system activities, there are two components of EMS responsibilities: EC and environmental sustainability. The EC component implements federal, state, tribal, and local regulatory requirements, agreements, and permitted activities as described in the *Environmental Protection Manual* (DOE 2025e) and *Environmental Instructions Manual* (DOE 2025d). The environmental sustainability component promotes and integrates sustainability initiatives as described in the *EMS Sustainability Teams Manual* (DOE 2024e) into all phases of safeguarding activities.

The authorities related to the EMS for the DRUM Program are described below. LM, the LMS contractor, and other contractor organizations manage work in a manner that protects natural resources in accordance with federal, state, local, and tribal laws and regulations; DOE policy; DOE directives; and Executive Orders.

10.1 Environmental Reviews and NEPA

The process described in Section 5.3.3 of NEPA (42 USC 4321 et seq.) requires federal agencies to conduct environmental reviews and prepare documentation for all projects that may impact the environment. The federal agency taking an action or making a decision (the lead agency) must conduct and document environmental reviews. Effective and efficient safeguarding program implementation relies on thorough and timely completion of environmental reviews and NEPA documents. Environmental reviews determine the level of NEPA documentation required and evaluate the need for consultations or other environmental requirements such as permits. Primarily, the safeguarding program will rely on the expertise of partner agencies and offices to complete environmental reviews and NEPA documents well in advance of construction contracting. Some documents, consultations, and permits require a substantial amount of time to complete; therefore, environmental review responsibilities will be determined well in advance of scheduled construction.

DOE's NEPA responsibilities are summarized in DOE Policy 451.1, *National Environmental Policy Act Compliance Program*, and DOE's NEPA implementation procedures are described in Title 10 *Code of Federal Regulations* Section 1021 (10 CFR 1021), "National Environmental Policy Act Implementing Procedures."

10.2 Cultural Resources

Federal laws and guidance, including Section 106 of the NHPA, provide protocols for any DRUM action that has potential to affect historic properties, culturally significant Native nation places or artifacts, and other cultural resources. These potential impacts are identified during the NEPA review for the proposed action, although earlier review may be appropriate. During the project planning process, partner agencies and tribes (local and historically affiliated) are consulted regarding whether the proposed actions could impact cultural resources and how to avoid, minimize, or mitigate such impacts. Partnering agencies conduct preconstruction cultural resources surveys, and the lead federal agency makes formal NHPA determinations. The survey findings are included in the NEPA documentation and reported to the State Historic Preservation Office (SHPO) and appropriate Tribal Historic Preservation Offices for their concurrence. A location-specific inadvertent discovery plan is prepared when appropriate. The LM/LMS *Cultural Resources Management Plan* (DOE 2022a) provides information on cultural resource laws and regulations, outlines a consistent approach for how LM will manage cultural resources, and includes considerations related to Native nation people.

10.3 Other Environmental Requirements

Natural resources potentially affected by safeguard construction activities include vegetation, wildlife, special-status species, and water resources. Many of these resources are protected by federal laws, including the Endangered Species Act, the Migratory Bird Treaty Act (16 USC 703–712), the Bald and Golden Eagle Protection Act (16 USC 668), the Clean Water Act (33 USC 1251 et seq.), the Clean Air Act (42 USC 7401 et seq.), and the Resource Conservation and Recovery Act (42 USC 6901–6992k). Preconstruction bat surveys and other plant, wildlife, and habitat surveys are performed by BCI. Survey reports are included in the NEPA documentation and influence the scope of work for safeguarding actions. The environmental and NEPA review would identify environmental requirements and the associated mitigation measures that must be followed during DRUM actions. Environmental concerns specific to the partnering agencies, tribes, or both would be considered during the planning and consultation phase of work.

10.4 Environmental Sustainability

The environmental sustainability component of the EMS promotes and integrates initiatives such as energy and natural resource conservation, waste minimization, and the use of sustainable products and services in all phases of work. U.S. General Services Administration vehicle management is integrated with EMS Vehicle and Fuel Use Team requirements. To support other EMS sustainability goals, DRUM personnel and partner agencies and offices practice water conservation, waste minimization, pollution prevention, and recycling.

11.0 Quality Assurance

The LMS *Quality Assurance Manual* (DOE 2024i) describes a Quality Management System (QMS) that incorporates the requirements of ISO 9001:2015, *Quality Management Systems—Requirements*; DOE Order 414.1E, *Quality Assurance*; and other customer-requirement documents. The QMS describes a "Plan-Do-Check-Act" cycle that promotes continuous improvement in all work activities. Process controls are applied based on the significance of the work being performed and the identified risk or consequence of failure. All work performed for LM by the LMS contractor and partnering agencies shall comply with applicable regulatory, commitment, and guidance documents. Location-specific work conducted at mine sites under the LMS contract shall also comply with additional state, local, and tribal regulations, as appropriate. Any work performed by or for the LMS contractor must comply with the QMS requirements, which are based on the principle that work shall be planned, documented, and performed under controlled conditions and completed, closed, and periodically assessed to establish work-item quality and process effectiveness and to promote continuous improvement. Elements of the QMS apply to all activities and all LM contractor work. The achievement of quality is the responsibility of those who manage and, most importantly, those who perform the work. Each person is expected to do their job in accordance with procedures and other requirements.

11.1 Quality Assurance Program Plan

The *Defense-Related Uranium Mines Quality Assurance Program Plan* (DOE 2024c) is intended for use by partner agencies and LMS contractor personnel performing various tasks, such as evaluating safeguard construction activity, collecting new data, and preparing reports for the DRUM Program. The ultimate success of the safeguarding program depends on the quality of the safeguards constructed and the ability to effectively communicate program goals and outcomes with partner agencies to assure appropriate decision making. Successful program implementation depends upon a comprehensive understanding of the various subtasks of the program. All parties involved in the safeguarding program (i.e., land management agencies; AML programs; other data users, data producers, and decision makers) are involved in the planning process to ensure that their needs are adequately defined and addressed.

11.2 Quality Assurance Requirements

The safeguard installation process includes establishing performance objectives, designing construction observation methods and procedures, monitoring procedures, and data reporting to satisfy the performance objectives. In order to verify that all information has been properly collected and recorded for each safeguard, appropriate DRUM Program personnel will perform quality assurance/quality control (QA/QC) checks at the following steps of safeguard project implementation: location delineation, construction, and data input. These QA/QC checks will be documented to provide accountability and assurance that all quality checks have been completed.

11.2.1 Data Management

High-quality data are important to the DRUM Program, and effective decision making requires reliable information. Safeguarding program final hazard disposition data, including visual representations (e.g., photographs, maps, schematics), automated tools, and manual processes

that check for completeness, accuracy, and internal consistency will be subjected to QA/QC. Only data that meet DRUM Program quality standards will be loaded into LM systems.

11.2.2 Operating Experience Program

The LMS Operating Experience Program captures and disseminates lessons learned from past activities to improve work processes, facility or equipment design and operation, quality, safety, and cost effectiveness. The DRUM Program will document lessons learned and incorporate operating experience from other programs. Further information on the LMS Operating Experience Program is found in the *Operating Experience (OpEx) Procedure* (DOE 2024h).

11.3 Assessments

Assessments evaluate the effectiveness of an organization on the basis of the following criteria: how well it meets customer and performance expectations; executes mission objectives; identifies strengths, improvement opportunities, and problems; uses resources effectively; and follows an integrated management system. Assessments should be conducted at a frequency commensurate with the risk and importance of the activity or dictated by a requirement. The *Assessment Program* (DOE 2024a) provides specific information.

12.0 Safety and Health

Implementation of the safeguarding program will be undertaken by LM and the LMS contractor; nonprofit organizations; partner federal, state, and tribal agencies; and subcontractors to these organizations. As described in Section 5.2.6, each agency, contractor, and subcontractor is responsible for the development, implementation, and documentation of safety and health protocols employed during the performance of safeguarding program-related tasks.

LM or the LMS contractor will perform work in accordance with the *Worker Safety and Health Program (10 CFR 851)* (DOE 2024k), the *Integrated Safety Management System Description*, the *Environmental Management System/Energy Management System Description*, the *LMS Safety and Health Program* (DOE 2023a), the *Radiation Protection Program Plan* (DOE 2024j), the *Radiological Control Manual* (DOE 2023c), and any other safety and health plans and procedures as applicable.

13.0 Risk Management

LM guidance directs that a contingency be applied to all LM activities because of the uncertainties associated with long-term program management. This contingency includes assessing the probability of a major event negatively impacting the program and the uncertainty associated with the assumptions and costs of performing the planned activities. An analysis of the potential for risk not covered in budget estimates and schedules provides the program manager an opportunity to develop mitigating measures to reduce the probability of a risk to program goals.

13.1 Statement of Risk

The DRUM Program is currently authorized to perform safeguard construction work at hazardous mine features. The biggest uncertainty for achieving program goals is likely to be the availability of requested outyear funding. Contracting capabilities and environmental review responsibilities are two additional uncertainties. The safeguarding program's potential risks and mitigation measures are summarized in Table 4 and described in the following subsections.

Table 4. Program Risk Screening

Potential Risk	Mitigation Measures
Funding	Outyear planning, scope or schedule reduction
Partner agency contracting capabilities	MOUs, operation plans, alternative contracting options
Environmental review responsibilities	Program-specific staffing

13.2 Anticipated Program Risks, Uncertainties, and Major Obstacles

- Long-term funding of the safeguarding program is an anticipated program risk. Two factors are integral to mitigating this risk:
  - DOE authority to fund and conduct safeguarding activities:
    - LM leadership will define program limitations in terms of congressional or statutory authority, available financial resources, and program time frames
  - Long-term LM priorities:
    - LM will develop strategic planning to ensure that the safeguarding program is integral to its mission
    - LM may work with state and tribal AML programs and land management agencies to evaluate cost sharing arrangements to accommodate funding issues
- Partner agency contracting capabilities present a potential risk to completing individual projects as planned, resulting in potential programmatic delays. Some factors related to this risk include the following:
  - A successful safeguarding program requires an efficient purchasing system that can complete timely contracting processes to secure safeguarding services, hold performance bonds, process change orders, and process construction-related and closeout construction contracts. State and tribal AML programs are best positioned to accomplish the construction contract purchasing process. AML programs should strive to complete focused agreements with their affiliated purchasing systems to establish a timely and efficient system of completing safeguard construction contracts.
  - BCI has the capability to issue safeguard construction contracts. BCI contracting capabilities may be utilized to supplement both short-term and long-term construction needs, particularly when state and tribal AML programs are either unavailable or foresee time constraints in their associated purchasing processes.

- Environmental review responsibilities and timing:
  - Completion of environmental reviews is a potential constriction in safeguard project timelines. LM and partner agencies will adapt existing AML safeguarding compliance procedures to provide an avenue for expedient completion and approval of NEPA documents. Alternatively, LM may help develop regional NEPA documents.
  - SHPO review and approval of safeguard construction projects may create a constriction in safeguard project implementation. These organizations work independently of state and tribal AML programs. Utilization of mining-specific specialists to complete historic preservation investigations and reporting and to act as SHPO liaisons with contracting and land management agencies may alleviate time and resource constraints.

14.0 Program Communications

The safeguarding program requires effective and comprehensive communication among LM, the LMS contractor, nonprofit organizations, partner agencies, and private landowners. This section describes effective communications within and among these organizations.

14.1 Internal LM Communication

LM will have regular team meetings to address programmatic issues, review current activities, and plan for future work. A network drive provides a repository for safeguarding program reports, environmental review documents, contracts, and other relevant program information.

14.2 Partner Agency and Private Landowner Communication

LM will communicate with partner agencies and private landowners through meetings, conferences, briefings, telephone calls, emails, and the LM website as appropriate. LM will collaborate with partner agencies to determine the scope of work to be performed, including long- and short-term planning and implementation of individual safeguard projects. At a minimum, LM will provide semiannual updates to brief partner agencies on program- and project-specific status, planning needs, new developments, and coordination.

LM, state or tribal AML programs, and BCI will initiate communication with private landowners regarding site access agreements, environmental reviews, construction planning, implementation, and closeout processes. State or tribal AML programs will include LM in all program-specific communications. The agency or organization completing monitoring and maintenance will communicate directly with private landowners regarding site access for any maintenance construction planning and implementation and include LM in all relevant communications.

14.3 Safeguarding Team Communication

Safeguarding team meetings will be held monthly to complete program- and project-specific planning, discuss specific work products, identify program strengths and needs, exchange ideas, and discuss issues key to the program's success. Project status tracking and reporting described in Section 9.1 will help measure overall program success.

14.4 Internal LMS Communication

The LMS safeguarding liaison will coordinate internal LMS communications with other groups such as Environmental Compliance and Safety and Health to identify and resolve issues, avoid crises, and achieve objectives.

14.5 Public Relations

The LMS Public Affairs program will collect, collate, and provide program- and project-specific public relations information directly to LM and the LMS safeguarding program manager. LM will, at its discretion, disseminate this information to the public. The LMS Public Affairs program includes national, intergovernmental, and local stakeholder involvement; public affairs and outreach; and community involvement required for the acquisition, maintenance, dissemination, and delivery of program and project knowledge and information. The *Public Affairs Manual* (DOE 2023b) describes the Public Affairs program's responsibilities, requirements, and procedures.

14.6 Freedom of Information Act (FOIA)

The DOE Office of Information Resources is responsible for administering policies, programs, and procedures to ensure the agency's compliance with FOIA (5 USC 552). All FOIA requests received by the program are directed to the FOIA coordinator and follow LM protocols. The investigatory records, specifically mine locations captured by the DRUM Program using GPS, could reasonably be expected to endanger the life or physical safety of any individual if disclosed before safeguard installation. Before safeguarding, mine-related physical hazards are considered attractive nuisances because they are both dangerous and inviting or intriguing to the public, specifically recreators and tourists.

Moreover, abandoned mine sites may contain mineral and cultural resources and may serve as habitat for threatened and endangered species. Disclosure of specific mine location information may lead to unauthorized extraction, vandalism, and theft and may have adverse consequences for human safety, cultural resource protection, and wildlife protection. As a result, the locations of hazardous mine features should not be disclosed before the functionality of constructed safeguards is assessed and monitored.

14.7 Stakeholder Inquiries

Public inquiries will be sent to the Uranium Mine Team supervisor (or delegated individual) to coordinate a response. The Uranium Mine Team supervisor will engage the LM ECHO team as necessary. Some inquiries must be coordinated with the DOE Office of Congressional and Intergovernmental Affairs in accordance with the *Processing Records Requests* procedure (DOE 2022b).

15.0 Program Completion

The DRUM Program will execute the safeguarding program by September 30, 2026, with the completion of the DRUM Program scheduled by September 30, 2027.

15.1 Program Closeout

A project completion report may be required by the Uranium Mine Team supervisor when the safeguarding program ends. Safeguarding program accomplishments will be included in DRUM Program congressional overview reports that will be submitted as individual DRUM Program campaigns are completed.

Records will be retained in the LM Business Center at Morgantown, West Virginia, until the established retention period has expired or transfer to another facility is required to comply with approved disposition. Physical program records will be retained in the format in which they were created unless a need for a particular record calls for digitization—in whole or in part—at which point the electronic copy will be maintained and considered the official record. It is strongly recommended that records be "born" in electronic format and managed electronically. If record transfer is required, Information Management personnel will perform the necessary tasks, as applicable, including acknowledgment of receipt.

16.0 References

10 CFR 1021. U.S. Department of Energy, "National Environmental Policy Act Implementing Procedures," *Code of Federal Regulations*.

5 USC 552. "Freedom of Information Act," *United States Code*.

16 USC 668. "Bald and Golden Eagle Protection Act," *United States Code.*

16 USC 703–712. "Migratory Bird Treaty Act," *United States Code*.

16 USC 1531 et seq. "Endangered Species Act," *United States Code*.

30 USC 611 et seq. "Surface Resources Act," *United States Code*.

33 USC 1251 et seq. "Clean Water Act," *United States Code*.

42 USC 2011 et seq. "Atomic Energy Act," *United States Code*.

42 USC 4321 et seq. "National Environmental Policy Act," *United States Code*.

42 USC 6901–6992k. "Resource Conservation and Recovery Act," *United States Code*.

42 USC 7401 et seq. "Clean Air Act," *United States Code*.

42 USC 9601 et seq. “Comprehensive Environmental Response, Compensation, and Liability Act,” *United States Code*.

43 USC 1701 et seq. “Federal Land Policy and Management Act of 1976,” *United States Code*.

54 USC 100101 et seq. “National Park Service Organic Act,” *United States Code*.

54 USC 300101 et seq. “National Historic Preservation Act,” *United States Code*.

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DOE (U.S. Department of Energy), 2024d. *Defense-Related Uranium Mines Verification and Validation Work Plan Campaign 1*, LMS/DRM/S13690-3.8, Office of Legacy Management, May.

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Appendix A

Safeguard Project Development

A1.0 Safeguard Project Development

Figure A-1 and Figure A-2 generally describe the safeguard project development cycle over time (including projects that do not require new NEPA documentation). New safeguard projects will be initiated annually to ensure the program will proceed in a timely, uninterrupted manner.

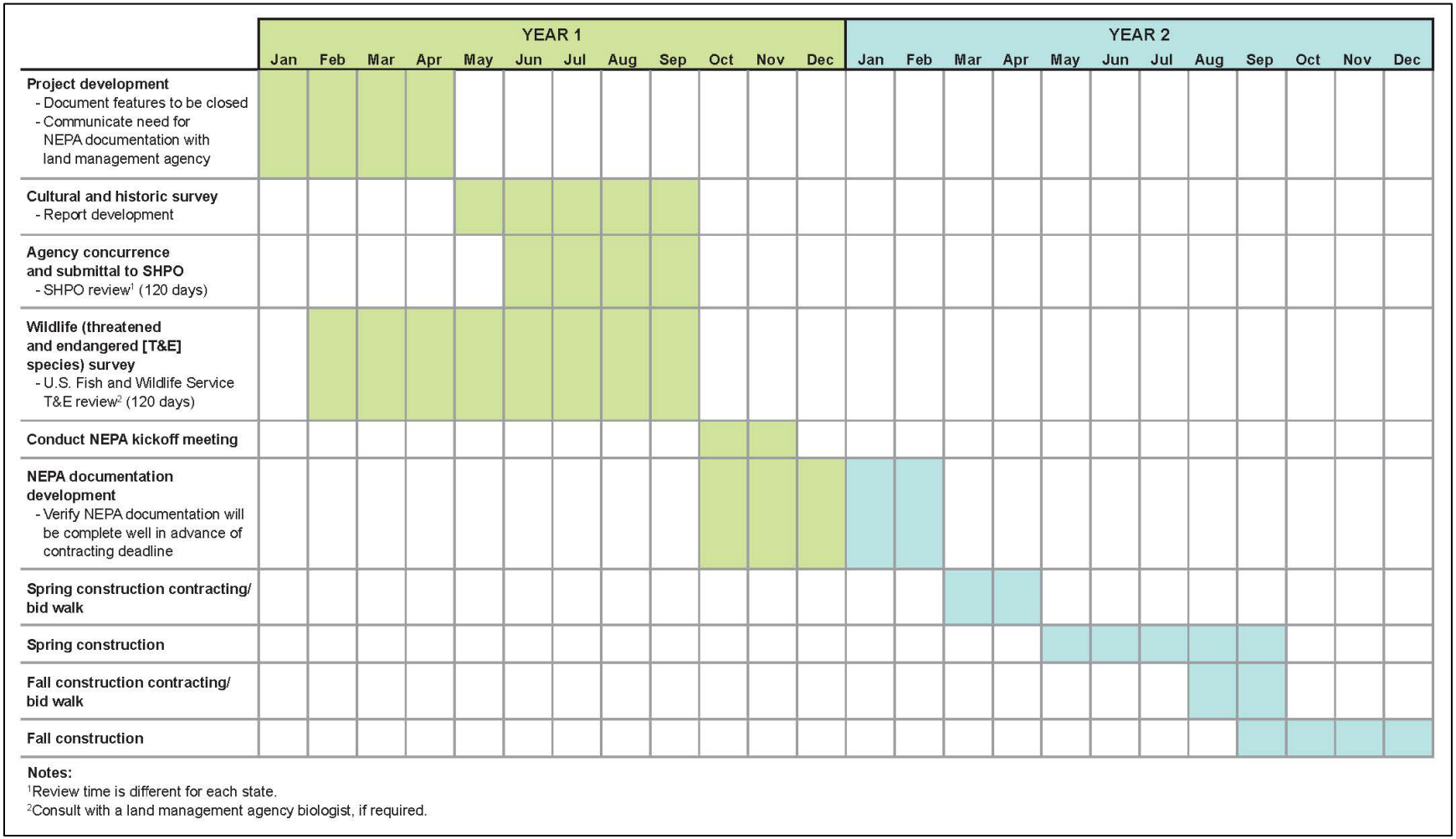
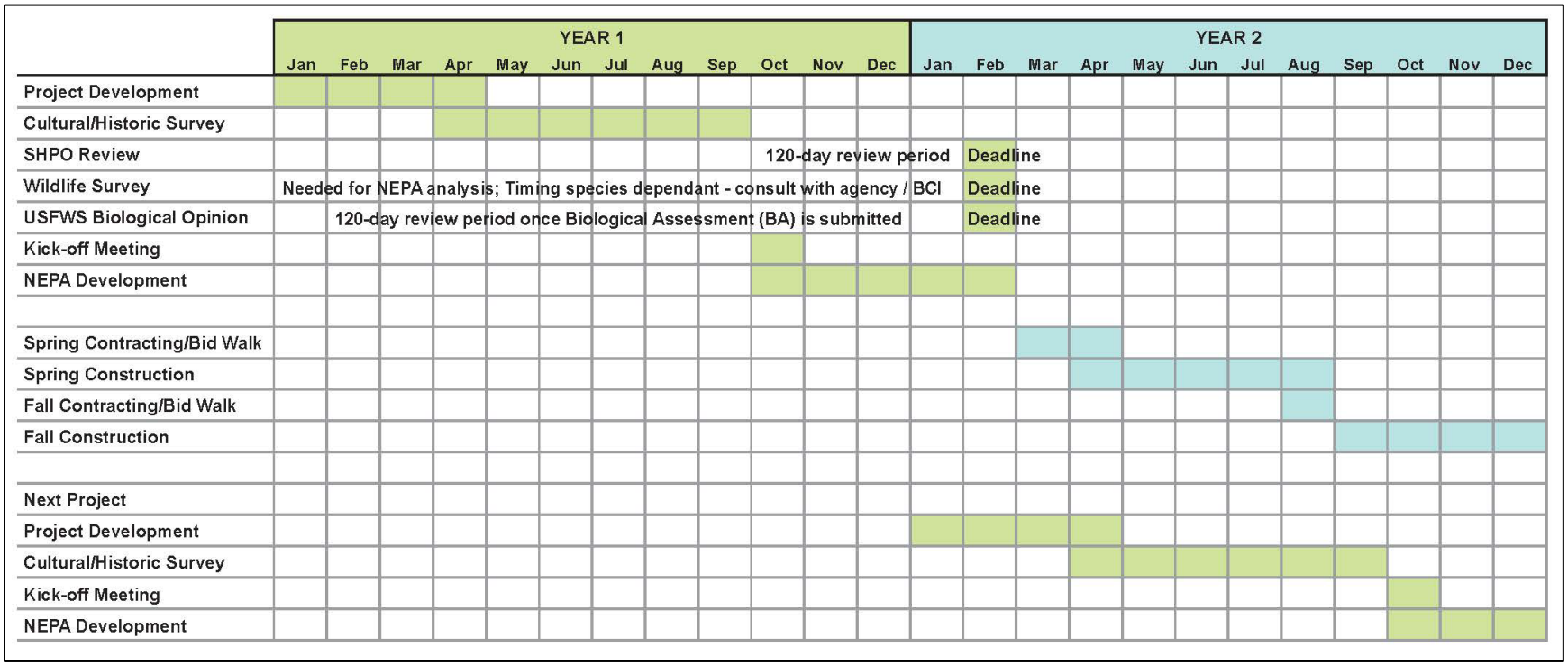


Figure A-1. Safeguard Project Timeline



Abbreviation: USFWS = U.S. Fish and Wildlife Service

Figure A-2. Typical Project Development Schedule