LM-GUIDE-3-20-2.0-0.0
LMS/POL/S07617-0.0

Guidance for Institutional Controls for Long Term Surveillance and Maintenance at DOE Legacy Management Sites

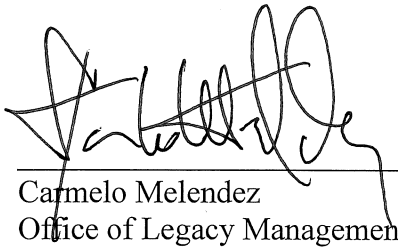
U.S. DEPARTMENT OF ENERGY | Legacy Management

This page intentionally left blank

Guidance for Institutional Controls for Long Term Surveillance and Maintenance at DOE Legacy Management Sites Document History

Version No./ Revision No.	Revised	Description of Change
0.0	December 2018	The *ICs Guidance* is now the *Guidance for Institutional Controls for Long-Term Surveillance and Maintenance at DOE Legacy Management Sites.* This document has been rewritten and reorganized to better emphasize the application of institutional controls based on the regulatory driver. Initial issue.

Approved:



Carmelo Melendez
Office of Legacy Management Director
U.S. Department of Energy

2/13/19
Date

This page intentionally left blank

Contents

Figures

Tables

Appendixes

Abbreviations

AEA	Atomic Energy Act
AIM	Archives and Information Management
BRMP	Beneficial Reuse Management Plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	*Code of Federal Regulations*
CRS	certified realty specialist
DCU	data collection utility
D&D	Decontamination and Decommissioning
DOE	U.S. Department of Energy
DOJ	U.S. Department of Justice
EC	environmental covenant
EO	Executive Order
EPA	U.S. Environmental Protection Agency
FIMS	Facilities Information Management System
FUSRAP	Formerly Utilized Sites Remedial Action Program
IA	interagency agreement
IC	institutional control
ICTS	Institutional Controls Tracking System
LCB	life-cycle baseline
LM	Office of Legacy Management
LMS	Legacy Management Support
LTS&M	long-term surveillance and maintenance
LTSP	Long-Term Surveillance Plan
LTS	long-term stewardship
LUC	land use control
NCP	National Oil and Hazardous Substances Pollution Contingency Plan (also known as the National Contingency Plan)
NPL	National Priorities List
NRC	U.S. Nuclear Regulatory Commission
NWPA	Nuclear Waste Policy Act
PM	protectiveness measure

RCRA	Resource Conservation and Recovery Act
RECO	real estate contracting officer
UECA	Uniform Environmental Covenants Act
UMTRCA	Uranium Mill Tailings Radiation Control Act
USACE	U.S. Army Corps of Engineers
USC	*United States Code*
UU/UE	unlimited use/unrestricted exposure

1.0 Introduction

During World War II and the Cold War, the federal government managed a vast network of mining operations and industrial facilities for nuclear weapons material acquisition, research, production, and testing, as well as other scientific and engineering research. Some radioactive and chemical contamination, other environmental contamination, and hazardous facilities and materials remained after the decommissioning and remediation of these sites. The U.S. Department of Energy (DOE) Office of Legacy Management (LM) was established in December 2003 to manage DOE's post-closure responsibilities and ensure the future protection of human health and the environment at many of these sites. As of March 2018, LM manages 92 sites in 25 states and Puerto Rico.

In support of LM's mission and Goal 1 of LM's *2016–2025 Strategic Plan* (DOE 2016a), which is to protect human health and the environment, LM is committed to supporting and conducting long-term surveillance and maintenance (LTS&M) activities in accordance with the various laws, regulations, requirements, policies, and guidance that apply to these sites. More than half of the sites currently in LM's inventory do not allow unrestricted use due to residual contamination from historical activities. Institutional controls (ICs) are required to limit human and environmental exposures to residual contamination by controlling land use, restricting access to potential hazards, and making the public aware of potential dangers from the residual contamination. ICs include legal instruments (such as land use restrictions), physical or engineering controls (such as fences, signs, and disposal cells), and methods for providing information to people about a site's cleanup history, including information on the remedy and current LTS&M activities.

Except for those sites that fall under the purview of U.S. Environmental Protection Agency (EPA) guidance authorities such as the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or Resource Conservation and Recovery Act (RCRA), the LM ICs strategy is based upon DOE Policy 454.1 Chg 1, *Use of Institutional Controls*, and DOE Guide 454.1-1, *Institutional Controls Implementation Guide for Use with DOE P 454.1*, in addition to the various statutory and regulatory requirements for ICs. ICs must be tailored to site conditions, the anticipated future land uses, and the site-specific expected exposures and risks that may occur. ICs are usually in place before a site transitions to LM's portfolio. ICs do evolve over time due to changing site conditions and potential human health and other environmental risks. LM's use, maintenance, and monitoring of ICs will continue to expand as more sites are transitioned into LM's inventory to ensure the long-term protection of human health and the environment at or near those sites.

This document provides guidance and information about LM's ICs Program for LM site managers and Legacy Management Support (LMS) personnel. The goal is to promote a common understanding of the role of ICs at LM sites and to describe the various documents and other methods utilized for successful application and management of ICs. Since many ICs are put in place before a site transitions into LM's inventory, this document is not intended to provide a step-by-step description of how to develop and implement ICs. Rather, it presents the framework for how LM manages ICs from the time a site transitions into LM's inventory and how LM uses, monitors, and maintains ICs at these sites to fulfill its mission and regulatory requirements. This guidance focuses on providing practical information and includes consideration of other issues related to ICs that support LTS&M activities at LM sites. It is intended to offer LM personnel

flexibility in their approaches to maintenance and monitoring of ICs without diminishing the ability of LM site managers to be creative in the application, compliance, and effective use of ICs to address site-specific issues and risks at the various LM sites.

The following sections are included below: General Scope and Purpose of ICs; LM's Programmatic Framework; Roles and Responsibilities; ICs Guidance for LM Sites Under UMTRCA Title I, UMTRCA Title II, D&D Program, and Other Regulatory Authorities; ICs Guidance for LM sites Under CERCLA and RCRA Authorities; Tracking of Institutional Controls; ICs and Beneficial Reuse; Records Management and ICs; Real Property File Plan; Definitions; References; and Bibliography.

2.0 General Scope and Purpose of ICs

ICs are required at a site where there are potential risks to human health and the environment due to residual contamination from historic activities. ICs can be identified and implemented at any time throughout the cleanup process as the risks are assessed and closure conditions are defined. "Risk" is generally defined as the likelihood that a receptor (such as a human, animal, or plant) will be affected physically by a stressor (such as contaminated air, soil, or water) to which it is exposed through physical contact, ingestion, or inhalation. Risk can be measured in a variety of different ways depending on the contaminant, the dose or maximum contaminant levels or alternative concentration limits or supplemental standard depending on the contaminant, the type of exposure, and the applicable laws and regulations that apply for that respective site.

Wherever feasible, site cleanup efforts are conducted to achieve an unrestricted use endpoint. An unrestricted use scenario typically assumes residential land use where the associated groundwater could be used as a drinking water source and where sensitive receptors, such as children, are routinely exposed to the soil and water. The risks are calculated by making certain assumptions about a number of exposure parameters (for example, the duration of exposure, volume of groundwater ingested daily, and age of the child). If the risks from the expected exposure scenario are unacceptable, ICs are required to mitigate or eliminate the potential exposure to that risk. For example, if the risk driver is associated with the ingestion of contaminated groundwater, ICs are placed in order to prohibit the installation of drinking water wells, which will prevent this exposure from occurring and reduce the risks to acceptable levels. For example, ICs will most likely be in place at sites cleaned to an industrial/commercial land use, instances where residual contaminated material remains onsite such as with a disposal cell.

DOE Policy 454.1, *Use of Institutional Controls*, requires an assessment to assure that the ICs do not circumvent or substitute for permanent solutions when such solutions are reasonably achievable. Such an assessment includes evaluating whether the ICs in place satisfy regulatory requirements and whether the terms of these ICs address or need to be modified to reflect changes in ownership, land use, or other site conditions that may impact their effectiveness. When risk remains, ICs are used to mitigate or eliminate exposure to the residual contaminants and permit certain land uses that are protective of human health, the environment, and the remedy.

3.0 LM's Programmatic Framework

LM's mission is to fulfill DOE's post-closure responsibilities for legacy sites and to ensure current and future protection of human health and the environment. Appendix A of the *LM Site Management Guide* (DOE 2018b) lists the 2018 LM inventory of 92 sites where LM conducts LTS&M activities in furtherance of its overall mission. "LTS&M" is defined in LM's *2016–2025 Strategic Plan* at https://energy.gov/lm/downloads/lm-2016-2025-strategic-plan as:

> "Site-specific physical or engineering controls institutions, information, and other mechanisms that ensure protection of people and the environment at LM sites where cleanup has occurred. The LTS&M scope includes land-use controls, monitoring, maintaining in-place remedies, monitoring systems and information management, and requesting adequate funding to implement the specific plans. 'Long-term stewardship' is often used synonymously with LTS&M…"

Due to LM's unique mission, LM does not own most of the sites for which it has LTS&M responsibilities. Thus, LM works with various federal, state, local, and private entities to execute its obligations associated with former DOE-owned sites. These parties include, for example, the U.S. Bureau of Land Management; the U.S. Forest Service; U.S. Fish and Wildlife Service; various tribal, state, and local governmental entities; and private parties. Table 1 provides an overview of the cleanup statutes, regulations, and programs that apply to LM sites. For each type of law, regulation, or program, the table lists the regulatory authority, fundamental characteristics, common elements of LM sites, and number of each type of site currently managed by LM.

As noted earlier, LM receives its sites through a transition process. The site transition begins approximately 2–3 years before LM commences LTS&M activities. LM has developed and incorporated certain processes for site transition under some of the specific regulatory programs that affect its sites. Those documents are identified below:

- For sites transitioning from the DOE Office of Environmental Management: *Development of Site Transition Plan, Use of Site Transition Framework, and Terms & Conditions for Site Transition* (DOE 2005) (available at https://energy.gov/sites/prod/files/mou.pdf).
- For sites transitioning from the U.S. Army Corps of Engineers (USACE) under the Formerly Utilized Sites Remedial Action Program (FUSRAP): *Memorandum of Understanding between the U.S. Department of Energy and the U.S. Army Corps of Engineers Regarding Program Administration and Execution of the Formerly Utilized Sites Remedial Action Program* (DOE and USACE 1999) (memorandum of understanding and attached letters available at https://energy.gov/sites/prod/files/2017/04/f34/FUSRAP_MOU.pdf).
- For sites transitioning under Uranium Mill Tailings Radiation Control Act (UMTRCA) (PL 95-604) authority: *Process for Transition of Uranium Mill Tailings Radiation Control Act Title II Disposal Sites to the U.S. Department of Energy Office of Legacy Management for Long Term Surveillance and Maintenance* (DOE 2016b).

If other sites transition to LM that are not subject to the above programs, authorities, or guidance, LM follows a process similar to that identified for transitioning sites, with the necessary modifications to address site-specific issues.

Table 1. Laws, Regulations, and Programs Associated with LM Sites

Law, Regulation, or Program	Regulatory Agencies	Fundamental Characteristics and Common Elements	No. of Sites Currently Managed by LM
CERCLA or RCRA	EPA and/or State and/or other federal agency under EO 12580	These sites are regulated in accordance with CERCLA, RCRA, or other hazardous or solid waste programs with respect to the cleanup process and standards applied. ICs are identified early in the cleanup process and are refined as cleanup progresses to site closure. EPA has issued several guidance and policy documents associated with ICs. The primary two documents are: *A Site Manager's Guide to Identifying, Evaluating and Selecting Institutional Controls at Superfund and RCRA Corrective Action Cleanups* (EPA 2000) and *Institutional Controls: A Guide to Planning, Implementing, Maintaining and Enforcing Institutional Controls at Contaminated Sites* (EPA 2012). The EPA guidance is discussed in more detail in Section 6.0 of this document.	8
UMTRCA Title I processing and disposal sites	NRC and/or State	The legislation enacting UMTRCA identifies the Title I sites. These sites have different characteristics and can include a disposal cell or be a former location for a uranium processing (milling) site. Disposal Cell Sites: These sites are mostly tailings piles moved from the processing site to isolated, geologically stable locations, although a small number of sites were stabilized in place at the former processing location. All of them are LM-owned sites, except the sites located on tribal land (for example, the Navajo Nation). The contaminants of concern are generally limited to radiological and trace metal constituents, such as uranium, molybdenum, and selenium. These sites are regulated under a general license issued by NRC. NRC must approve LM's LTSP that identifies the LTS&M requirements, which include but are not limited to ICs. Processing Sites: These sites have been transferred to various third party owners, and DOE works closely with these owners to establish, maintain, and monitor the ICs required to protect human health and the environment. Contaminated soils have undergone active remediation, which can include removal of all soils above a defined standard, or, in some cases, residual contamination was left in place and ICs (deed restrictions or environmental covenants) are in place to prohibit disturbance of these soils and protect exposures from contaminated groundwater. Such ICs may be proprietary or governmental controls, such as a state's environmental covenant law. Contaminated groundwater may also be present at these sites and can persist for many years beyond completion of active soils remediation. NRC (or Agreement State) has regulatory authority over processing-related contaminated groundwater at these sites. The GCAP is one of the primary regulatory documents that identify the ICs associated with the site.	21
UMTRCA Title II disposal sites	NRC and/or State	Title II sites are uranium milling sites that were regulated under an active NRC license when UMTRCA was enacted in 1978. Private companies or other third parties (licensees) remediate these sites under the terms of a specific NRC license. Upon license termination, ownership of the byproduct materials is transferred to DOE in accordance with the laws and regulations under an NRC general license and approved LTSP. These sites usually require annual inspections, and the ICs are critical to managing the disposal cells and contaminated groundwater.	6

Table 1. Laws, Regulations, and Programs Associated with LM Sites (continued)

Law, Regulation, or Program	Regulatory Agencies	Fundamental Characteristics and Common Elements	No. of Sites Currently Managed by LM
D&D program sites	LM and/or State, in some cases	At the time of transition to LM, the main regulatory driver for these sites was DOE Order 5400.1 (which has been superseded by DOE Order 458.1 Admin Chg 3, *Radiation Protection of the Public and the Environment)*. D&D program sites include decommissioned reactors, decontaminated buildings, and landfills. These sites require ongoing LTS&M activities and can have ICs.	5
FUSRAP	DOE, USACE, EPA, and/or State	FUSRAP sites were formerly used by the USACE MED and AEC under contract to, or owned by, the government. Research, processing, and storage of radioactive materials were performed at these sites. The program began in 1974 with initial surveys of these sites, which were not licensed by NRC. DOE proceeded with decontaminating the sites at the conclusion of the contract work performed. Most of these sites were originally subject to the cleanup standards in 40 CFR 192. In 1997, Congress transferred responsibility for administration and execution of FUSRAP from DOE to USACE under the Energy and Water Development Appropriations Act of 1998 (PL 105-62). In the appropriations acts for Fiscal Years 1999 and 2000 (PLs 105-245 and 106-60, respectively), USACE was directed to conduct remedial actions in accordance with CERCLA (42 USC 9601 et seq.) and the NCP (40 CFR 300). These laws assigned responsibility to USACE for characterization, remediation, and verification of cleanup goals on FUSRAP sites, while DOE retained responsibility for determining site eligibility and managing site records. DOE can become responsible for LTS&M activities at these sites when those activities are not assumed by private, public, or other federal entities. USACE is the lead agency for these sites until the site is transitioned into LM's inventory for LTS&M activities. LM cooperates with USACE on transition activities. If the site is federally owned, USACE assumes responsibility for LTS&M activities for 2 years from site closeout, if those activities are required. For all other sites, LM is responsible for LTS&M activities starting 2 years from the date of the closure report, if required. For planning and budgeting purposes, LM evaluates its responsibilities and obligations for these sites, including any ICs, at the time that the site transitions from USACE to LM and annually during the LCB process for the current LM inventory of FUSRAP sites.	31
NWPA Section151	NRC and/or State	One site (Parkersburg, West Virginia, Disposal Site) was remediated under Section 151 of the NWPA, which contains provisions for transferring privately owned disposal sites to the federal government, if the site activities were conducted for the benefit of the government. NRC is the regulator for this site.	1
State Water Quality Standards	State	One site (Geothermal Test Facility, California, Site) was remediated under the State Water Quality Standards. Cleanup was regulated by the Colorado River Basin Regional Water Quality Control Board, a California state agency, under the Waste Discharge Requirement Order of 1989.	1
Nevada Offsites		Locations in the continental U.S. where underground nuclear tests were conducted or sites that were evaluated for such tests that are located off of the Nevada National Security Site (formerly the Nevada Test Site).	9
MED/AEC Legacy Sites		Sites that were associated with the program during World War II to produce the first nuclear weapons as well as AEC sites associated with early weapons development.	10

Note:
The number of sites currently managed by LM is from the *LM Site Management Guide* (DOE 2018b).

Table 1. Laws, Regulations, and Programs Associated with LM Sites (continued)

Abbreviations:
AEC = U.S. Atomic Energy Commission
CFR = *Code of Federal Regulations*
D&D = Decontamination and Decommissioning
EO = Executive Order
GCAP = Groundwater Compliance Action Plan
LCB = life-cycle baseline
LTSP = Long-Term Surveillance Plan
MED = Manhattan Engineering District
NCP = National Oil and Hazardous Substances Pollution Contingency Plan (also known as the National Contingency Plan)
NRC = U.S. Nuclear Regulatory Commission
NWPA = Nuclear Waste Policy Act
USC = *United States Code*

The long-term management of each LM site is designated as one of three categories based on the actual or anticipated LTS&M activities associated with that site:

- **Category 1:** These activities are typically limited to records-related activities and stakeholder support.
- **Category 2:** These activities typically include routine inspection (any site visit needed to verify the integrity of the ICs), monitoring and maintenance, records-related activities, and stakeholder support.
- **Category 3:** These activities typically include operation and maintenance of active remedial action systems, routine inspection (any site visit needed to verify the integrity of the ICs), monitoring and maintenance, records-related activities, and stakeholder support.

LM's approach to ICs—including planning, establishing, maintaining, tracking, and enforcing them—is applicable regardless of the regulatory driver and closely follows the continuous improvement concepts in DOE's Integrated Safety Management System and the Environmental Management System. The IC process mirrors the core concepts of the Plan-Do-Check-Act cycle (Figure 1). This process supports the life-cycle baselines (LCBs) that are developed for the sites each year. When the IC process is carefully considered and executed, the ICs will effectively protect human health and the environment, have a fully documented rationale and supporting documentation, and will be maintained to ensure ongoing protectiveness and compliance.

ICs are integral to LM's mission to fulfill DOE's post-closure responsibilities and ensure the future protection of human health and the environment. They are additional layers of protection related to the remedy that are evaluated and developed during remedy selection and put in place during remedy implementation. LM continually works to accomplish this by:

- Restricting the uses of land, facilities, and personal property to prevent or limit inadvertent human or environmental exposure to residual contamination or other hazards.
- Ensuring regulatory compliance.
- Protecting the environment, including the cultural and natural resources.
- Appropriately limiting access to LM's sites to keep the sites and facilities secure.
- Ensuring prompt notification of and response to degraded site conditions that could result in increased risks at the site.

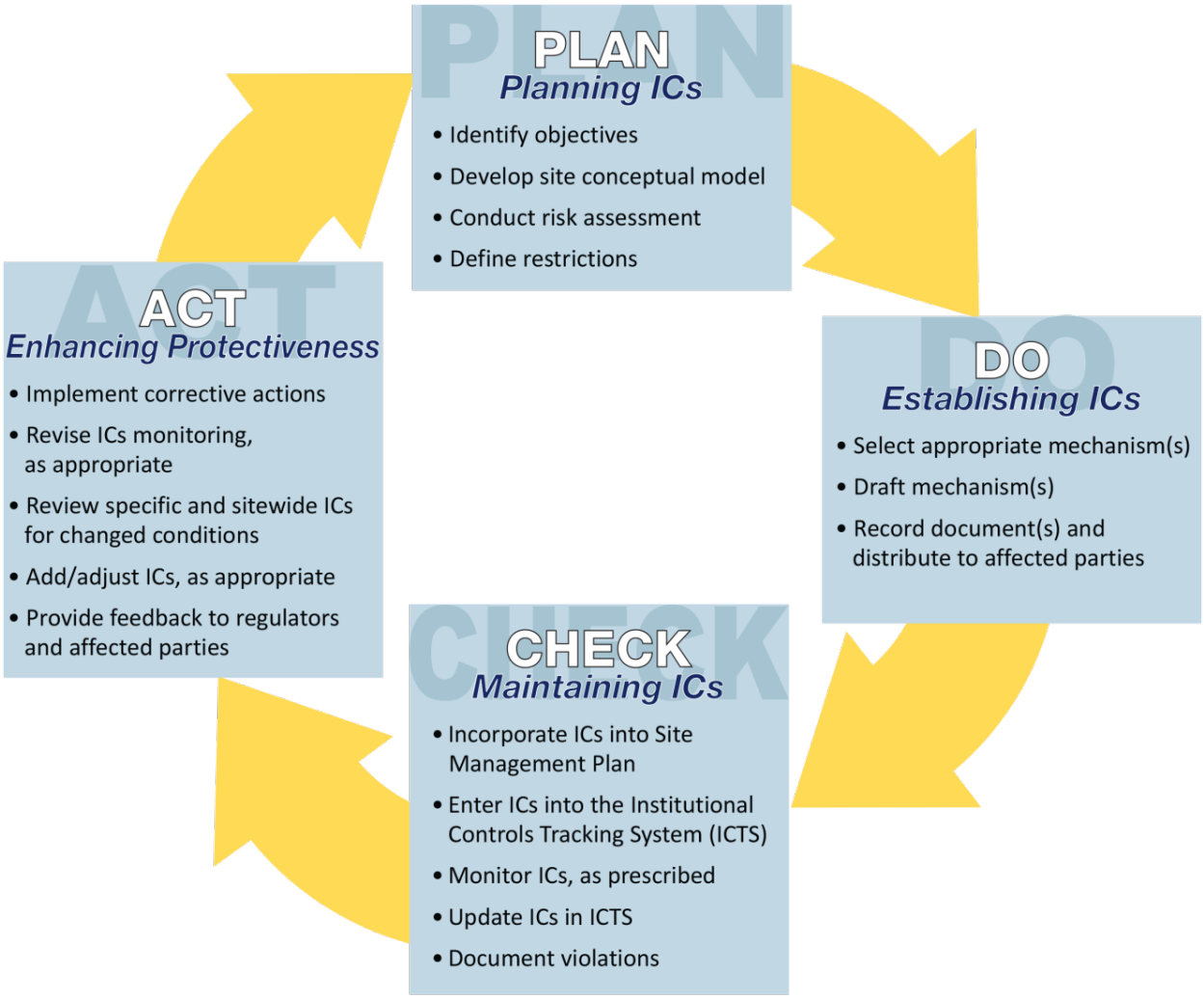


Figure 1. Plan, Do, Check, Act Cycle

ICs are developed before and during the transition period. LM utilizes a graded approach to determine what types and levels of ICs and protectiveness measures (PMs) most effectively address the risk. For example, if unacceptable risks are associated with the ingestion of contaminated groundwater, ICs are planned, developed, and implemented at the site to prevent the installation of drinking water wells. For sites transitioning to LM, it is imperative for the LM site manager and the supporting LMS contractor personnel to understand the exposure points and land use assumptions on which site closure was based and to ensure the ICs remain protective over the long term. This understanding is also critical for evaluating the potential impacts of any future changes in land use or other site conditions that may impact risks.

ICs are based upon an assessment of what ICs are required and what type of legal instrument or document can best fulfill the intent of the IC. The categorization and definition of ICs depend on the regulatory authority for site cleanup. Where the regulatory authority's laws, regulations, and requirements differ from DOE's policies and guidance for ICs, LM defers to the applicable requirements and guidance for ICs associated with those regulatory authorities used for cleanup

and closure of the site. For example, LM sites under CERCLA authority follow the EPA guidance on ICs.

In addition, LM's unique mission as a federal land manager and steward can include additional responsibilities for PMs that are designed to protect the cultural, natural, or historical resources at a site.

The following sections detail the roles and responsibilities of LM and LMS contractor personnel for LM's IC program and provide a framework for ICs in accordance with the requirements and guidance documents associated with the current regulatory authorities for LM sites. They include information about the applicable laws, regulations, policies, and guidance; planning considerations; monitoring and maintenance needs; and enforcement mechanisms and authorities.

4.0 Roles and Responsibilities

The LM ICs Program requires support from all levels of the organization in order to successfully implement the controls and assure protection of human health and the environment. Table 2 discusses the roles and responsibilities of LM and LMS contractor personnel in this program.

Table 2. LM and LMS Roles and Responsibilities for ICs

LM		LMS	
LM Director	• Assigns qualified property management staff. • Ensures federal accountability for the proper stewardship of real and personal property assets. • Provides annual program direction, guidance, and oversight for implementation of property management requirements. • Reviews and approves Five-Year Site Plans, Site Sustainability Plans, and FIMS data submittals.	LMS Program Manager	• Provides overall direction for the LMS contract. • Reviews and accepts management plans, including long-term stewardship (LTS) Plans and other document submittals.
Director of Site Operations	• Oversees and assigns specific LM-wide program initiatives. • Ensures federal accountability for the proper stewardship of real and personal property assets. • Provides annual program direction, guidance, and oversight for implementation of property management requirements. • Reviews and approves Five-Year Site Plans, Site Sustainability Plans, and FIMS data submittals.	LMS Projects and Programs Manager	• Provides overall direction for the LMS task assignments related to LTS&M of LM sites.
		LMS Task Assignment Managers	• Responsible for individual task assignments and LMS site leads report to the assigned task assignment manager.
LM Asset Management Team Lead	• Plans and executes the overall management of LM assets, including ICs in coordination with LM site managers. • Formulates and integrates goals, planning, and project control for asset management functions. • Manages LM's leased and government-owned facilities. • Plans for future growth of existing facilities and new offices as the LM mission expands.	LMS Asset Management Manager	• Responsible for providing real and personal property resources to LM and LMS project staff to support LTS&M activities. • Serves as the point of contact for asset management of real and personal property and reuse programs. • Accountable for the quality, accuracy, completeness, and overall success of real and personal property activities.

Table 2. LM and LMS Roles and Responsibilities for ICs (continued)

LM		LMS	
LM Site Managers	• Identify, use, implement, oversee, integrate, document, maintain, and terminate ICs at their sites. • Accountable for the proper stewardship of real property assets at their sites. • Evaluate beneficial reuse opportunities at their respective sites. • Work with the CRSs, RECOs, LMS site leads, and LMS RPS. • Ensure that property and IC needs are defined and deadlines to meet needs are understood. • Evaluate environmental considerations, regulatory requirements, NEPA analyses, engineering and real estate ICs, natural resource impacts, and cultural resource impacts at their respective sites. • Develop and implement IC maintenance, as necessary. • Monitor ICs to ensure the controls are effective and engage appropriate regulators or other parties if ICs need to be enforced. • Communicate with the site regulator; other federal, tribal, state, and local government entities; and other affected stakeholders on ICs and site conditions. • Ensure that the ICs are inventoried and documented in site closure documents (for example, the LTSP or Record of Decision). • Create, add, and implement PMs as necessary.	LMS Site Leads	• Assist LM site managers in the identification, use, implementation, oversight, integration, documentation, maintenance, and termination of ICs at their respective sites. • Accountable to LM site managers, LMS senior managers, and LMS task assignment managers for the proper stewardship of real property assets. • Work with LMS RPS to ensure that site-specific real property actions are defined and that the deadlines to meet needs are understood. • Assist LM site managers in evaluating environmental considerations, regulatory requirements, NEPA analyses, engineering and real estate ICs, beneficial reuses, natural resource impacts, and cultural resource impacts at their respective sites. • Work with LMS RPS to verify that site-specific IC actions are defined and deadlines to meet those needs are understood. • Responsible for supporting LMS real property with IC tracking, including validating all ICs associated with their respective sites. • Identify any changed conditions, such as land use, that may impact the effectiveness of the current ICs and/or the need to modify or add additional ICs. Provide this input to the LM site manager. • Develop a budget for costs associated with the development, implementation, monitoring, and maintenance of ICs at their respective sites. • Monitor ICs at their respective sites to confirm the ICs are effective and relevant parties are aware of them. • Document all pertinent decisions regarding findings or observations related to ICs, and confirm that the required resolutions are implemented and documented.

Table 2. LM and LMS Roles and Responsibilities for ICs (continued)

LM		LMS	
LM RECO	• Executes, on behalf of the federal government and within the limits prescribed in his or her certificate of appointment, real estate agreements and instruments to acquire, manage, and dispose of real property assets. • Complies with the requirements in statutes, regulations, Executive Orders, policy letters issued by the Office of Federal Procurement Policy, DOE acquisition letters, financial assistance letters, DOE directives, and other federal agencies' procurement policies and procedures. • Manages real property in accordance with his or her certificate of appointment. • Disposes of real property in accordance with his or her certificate of appointment. • Shares all CRS responsibilities. • Directs all real property actions to which LM is a party. • Executes all instruments with a real property interest on behalf of LM.	LMS RPS	• Ensures that LM assets are used with full consideration of economy, efficiency, current and future programmatic needs, and the applicable laws and regulations. • Supports the CRS during the phases of IC and PM implementation, modification, and revocation. • Works with LM and LMS project personnel to verify that site-specific language is in documents, including the ICs. Drafts instruments for site needs, and submits them to the appropriate CRS for approval before LM submittal to other parties for final execution. • Reports real property actions and statistics, and ensures that reporting is consistent with FIMS and other databases that serve as sources for real property asset tracking. • Ensures that record copies are submitted to the AIM organization as the official record holder. • Responsible for real and personal property activities assigned to them by the LMS Asset Management manager. • Interfaces directly with RECOs and CRSs, LM and LMS project personnel, and external government and nongovernment parties, as directed by LM. • Supports LM in maintaining documents and databases associated with real property to maintain their accuracy and completeness by ensuring that all real property within LM's purview is reported in accordance with DOE Order 430.1C, *Real Property Asset Management*, and all other DOE real property requirements.

Table 2. LM and LMS Roles and Responsibilities for ICs (continued)

LM		LMS	
LM CRS	• Reviews and approves federal and contractor real estate actions to acquire, manage, and dispose of interests in real estate prior to execution, including review of IC related documents. • Ensures that applicable real estate laws, regulations, and policies are observed in the decision-making process and resulting agreements or instruments. • Negotiates, or manages the negotiations for, actions to acquire, manage, or dispose of interests in real estate in support of a DOE program office decision to pursue any particular real estate action. • Supports coordination of real estate activities that include, but are not limited to: — Acquiring real property assets and interests by lease or purchase, and managing real property assets and interests. — Assisting LM site managers in selecting, establishing, modifying, or revoking the appropriate IC instruments and mechanisms. • Ensures compliance with CERCLA and RCRA real estate requirements.	LMS RPS	• Same responsibilities as above.
LM Environmental Compliance Lead	• Identifies and interprets regulatory requirements. • Assists with the NEPA process, which includes review of land use. • Promotes cultural resource identification and preservation at LM sites. • Promotes natural resource and wildlife identification and management at LM sites. • Submits regulatory compliance reports required by regulations and permits, including those that may be associated with ICs. • Obtains regulatory permits, and provides oversight. • Conducts compliance reviews and assessments.	LMS Environmental Compliance Manager	• Assists in completing tasks associated with NEPA, which includes review of land use. • Assists LMS site leads in complying with cultural resource laws, regulations, orders, and policy statements by helping plan and budget cultural resource activities.

Table 2. LM and LMS Roles and Responsibilities for ICs (continued)

LM		LMS	
LM NCO	• Develops, makes recommendations, and implements procedures that ensure compliance with NEPA. • Advises LM personnel and the LMS NEPA coordinator on NEPA-related matters. • Coordinates compliance actions and strategies with the appropriate LM and LMS personnel. • Has signatory authority for NEPA categorical exclusions.	LMS NEPA Staff	• Has primary responsibility for assisting LM by completing tasks associated with NEPA.
LM Reuse Asset Manager	• Determines the compatible uses on LM sites and assists LM site managers in evaluating potential beneficial land reuse options, environmental considerations, regulatory impediments, NEPA analyses, engineering and real estate ICs, natural resource impacts, and cultural resource impacts. Such uses must be compatible with ICs at the sties.	LMS Beneficial Reuse Lead	• Assists the LM Reuse Asset manager in meeting the reuse requirements and initiatives including ICs and how they may impact use.
LM Cultural Resources Staff	• Promotes identification and preservation of cultural resources.	LMS Cultural Resource Staff	• Provides assistance to the LM Cultural Resources Program manager

Abbreviations:
AIM = Archives and Information Management
CRS = certified realty specialist
FIMS = Facilities Information Management System
ICTS = Institutional Controls Tracking System
LTS = long-term stewardship
NCO = National Environmental Policy Act compliance officer
NEPA = National Environmental Policy Act
RECO = real estate contracting officer
RPS = Real Property staff

5.0 ICs Guidance for LM Sites Under UMTRCA Title I, UMTRCA Title II, D&D Program, and Other Regulatory Authorities

5.1 LM's IC Framework

Except for those sites that fall under CERCLA or RCRA regulatory authority or are covered by EPA's guidance authorities as described in Section 6.0, the LM ICs strategy is based on DOE Policy 454.1 Admin Chg 1, *Use of Institutional Controls*, and DOE Guide 454.1-1, *Institutional Controls Implementation Guide for Use with DOE P 454.1*, in addition to the various statutory and regulatory requirements for ICs.

As used in DOE Policy 454.1, ICs include legal instruments (such as land use restrictions), physical or engineering controls (such as fences, signs, and disposal cells), and methods for providing information to people about a site's cleanup history, including information on the remedy and current LTS&M activities. DOE Policy 454.1 uses this broader application of ICs to encompass the diverse nature of controls and measures used throughout the various programs and regulatory authorities across the DOE complex in a consistent yet flexible policy framework integrated into an overall program.

In DOE Guide 454.1-1, LM is specifically tasked with identification, implementation, evaluation, maintenance, and documentation of ICs, including communication of IC failures and resolutions. LM's responsibility includes ensuring that ICs remain in place as long as they are required at LM sites and that these controls and measures remain effective even if there is a change in site ownership or land use at the site.

Both DOE Policy 454.1 and DOE Guide 454.1-1 recognize that federal, state, and local laws, regulations, and other drivers require maintenance and management of ICs at all LM sites. While DOE Policy 454.1 and DOE Guide 454.1-1 set forth the DOE IC categories and types, LM has modified some of these IC categories to provide LM with the flexibility needed to fulfill its mission. There are three general types of LM ICs:

- **Administrative Controls**: Legal controls
- **Informational Controls:** Methods of preserving the risk and hazard information for current and future generations
- **Physical Controls:** Physical barriers and engineering or structural features

These IC categories are not mutually exclusive, and one category can contain aspects of another category. LM uses this broad context of titles and protections to incorporate common terminology and uses of ICs under the different laws and regulations that apply to LM sites. Table 3 lists these LM IC categories and provides examples of the kinds of restrictions imposed and the definitions associated with each category.

Table 3. LM IC Categories and Types

Types of ICs	Restrictions	Definition
Administrative Controls IC Category		
Proprietary Controls	*State statutory and common law:* • Easements and covenants • Deed restrictions	Proprietary controls tend to affect a single parcel of property and document the land use restrictions through private agreements—usually between a landowner (grantor) and a second party (grantee). The grantor agrees to restrict access and activities to protect human health and the environment from residual contamination and ensure maintenance of the remedy, and the grantor has the right to enforce those restrictions. Because these types of agreements grant a property interest, the documents are usually recorded with the appropriate city or county clerk, and since these restrictions "run with the land," they are binding on future landowners or those who have a property interest. In general, state laws authorize these types of controls.
Governmental Controls	• Zoning ordinances • Overlay zone • Well-drilling restrictions • Building codes and permit requirements • Commercial fishing bans; sports and recreational fishing limits • Land withdrawal *Environmental and statutory mechanisms:* • Jurisdictional wetlands • Cultural resources • Historical site • Endangered species habitat • Floodplain regulations	Governmental controls impose restrictions on large areas of land or resource use through the authority of a government entity to protect the health, safety, and general welfare of the public. These controls are usually established and operate independently of regulatory authorities and are enforceable by the federal, tribal, state, or local governmental entities responsible for the restriction. Environmental and statutory mechanisms are federal, tribal, state, and local laws or regulations that affect a particular site but might not be directly associated with the site cleanup or LTS&M activities that protect human health, the environment, and the remedy. Regardless of the remedy or the requirements of the LTSP or LTS Plan, these types of laws apply to a site based on its location, specific site conditions (such as wetlands), or historic significance.
Regulatory Enforcement Mechanisms	• NRC general licenses issued under 10 CFR 40 • LTSPs accepted under 10 CFR 40 • LTS Plans or other Operations and Maintenance Plans • Groundwater Compliance Action Plans	These mechanisms are based in the regulatory authorities for cleanup of a particular site. They define the performance of certain activities (such as restricting access to contaminated groundwater) to maintain protectiveness, or they define those LTS&M actions required to maintain the protectiveness established during remediation. These documents can also identify physical or informational controls necessary to maintain protectiveness of the remedy. If supplemental limits were applied, these documents may contain those site-specific concentrations. LTSPs are required for UMTRCA sites and are legal instruments that limit certain site activities or require the performance of specific activities associated with the response action or remedial program at LM sites.

Table 3. LM IC Categories and Types (continued)

Types of ICs	Restrictions	Definition
Informational Controls IC Category		
Informational Devices	• Health advisories • Fish consumption advisories • Deed notices • State registries of waste sites • Tracking systems • Signs	Informational devices are mechanisms designed to provide information to current and future generations about past site activities and to maintain awareness of residual contamination, sensitive resources, and the associated restrictions on land use or resources. In general, informational devices do not provide enforceable restrictions.
PMs	• Fact sheets • Webpages • DOE Wellhead Security	As stated above, PMs are developed to provide additional information about an LM site, such as information about historic operations, or to provide additional information to the public and stakeholders about the residual contamination and status of LTS&M activities.
Physical Controls IC Category		
Physical Controls	• Disposal cells • Fences • Site markers • Survey and boundary monuments • Wellhead security • Signs • Site markers	Physical controls are designed for site-specific conditions to protect the remedy and isolate residual contamination or site hazards from the biosphere. They are manmade structures or barriers that limit access to a site. For example, signs and site monuments are classified as physical controls, as they can be used to define the site boundary, provide the public with historic information or information on residual contamination, and provide an LM point of contact for further information.

Abbreviations:
CFR = *Code of Federal Regulations*
LTS = long-term stewardship
NRC = U.S. Nuclear Regulatory Commission

5.1.1 ICs at LM Sites on Tribal Lands

LM has several sites on tribal lands in the western United States. Most tribes are sovereign nations with authority and jurisdiction over land use and associated restrictions. Sites on tribal lands are held in trust by the United States of America for the U.S. Bureau of Indian Affairs. On most LM sites located on tribal lands, ICs have not been formally established; however, alternative or informal use restrictions are honored in order to protect human health and the environment when residual contamination remains on site. LM works with tribal representatives to identify the needed restrictions and the areas affected by those restrictions and to identify a process to evaluate the restrictions periodically to ensure that they are in place and working as intended. LM and their respective tribal counterparts collaborate to develop mechanisms to establish the restrictions, processes to ensure the restrictions are known to those affected by them, and enforcement procedures to ensure the restrictions are maintained until they are no longer needed. Site managers should work with their tribal counterparts to help identify the best mechanisms to protect human health and the environment.

An example is sites located on the Navajo Nation, where the Nation holds title to the land through a trust. DOE and the Navajo Nation executed a Custodial Access Agreement that conveys to the federal government title to the residual radioactive materials stabilized at the repository site and ensures that DOE has perpetual access to the site.

In addition, LM has obtained a Care and Custody Agreement or a similar agreement that ensures LM the right of access to conduct LTS&M activities at these sites. LM currently holds, or is negotiating, cooperative agreements with the Navajo Nation, Hopi Nation, Spokane Tribe, Northern Arapahoe Tribe, and Eastern Shoshone Tribe to conduct LTS&M activities and ongoing groundwater remediation at sites that affect these tribes. LM and its representatives work in cooperation with tribal agencies to prevent access to and use of tribal lands as part of facilitating remedial action for protection of human health and the environment.

5.2 Planning and Development of ICs

In situations where unrestricted use or unrestricted release of property is not desirable, practical, or possible, the ICs are necessary and important to LM's efforts to protect human health and the environment. LM utilizes a graded approach to determine what types and levels of ICs and PMs should be used to address the risks.

ICs are identified and developed in conjunction with the closure objectives for a site, and they are usually in place prior to a site's transition to LM. During the site transition process, LM reviews and evaluates the ICs and how to best support and maintain them under the various laws, regulations, and other authorities consistent with the site's remedy and closure.

There are a number of LM sites that LM does not own, but ICs are required as part of the remedy or closure. LM works closely and actively participates with the respective property owners and regulators on applicable and appropriate ICs in order to protect human health and the environment and promote long term stewardship of the site. For these sites, LM would most likely have some type of site access but not have the authority to enforce ICs; however, site-specific circumstances might warrant action by DOE.

For sites where LM is or will be the owner, LM takes an active role in the identification and development of ICs in conjunction with the other federal, state, tribal, and local government agencies as well as affected landowners and other stakeholders that are part of the cleanup process. LM's goal is to protect human health and the environment by utilizing strategies that will be protective and sustainable over the long term, since many LM sites are required to have LTS&M activities indefinitely. Common ICs at LM sites include restrictions on land use, soil excavation, and groundwater use.

LM is required to develop Long-Term Stewardship (LTS) Plans to incorporate applicable statutes and regulations for a site to support the site's monitoring and maintenance activities as well as other PMs and items which support the long term needs of a site. For example, for those sites under the UMTRCA Title I and Title II authorities, U.S. Nuclear Regulatory Commission (NRC) regulations require that a Long-Term Surveillance Plan (LTSP) be developed and approved to meet the NRC general license, which describes the site, final site conditions, LTS&M activities, reporting requirements, and criteria for follow-up inspections, site maintenance, and emergency measures. The LM *Guidance for Developing and Implementing Long-Term Surveillance Plans for UMTRCA Title I and Title II Sites* (DOE 2012) identifies and discusses ICs as part of development of the LTSP.

Regardless of the underlying regulatory authority for site cleanup, LM manages ICs in the most cost-effective way possible. During site transition, the LM site manager should consider the costs for implementing, monitoring, and maintaining LM's IC responsibilities associated with closure of the site.

Included in the planning and development of ICs, LM annually updates a 75-year LCB for each site. The LCB provides management with insights related to the costs and resources expected at each site, and the LCB process includes identifying support for specific activities, such as development of ICs during transition of a site to LM's portfolio, and monitoring and maintenance of ICs in order to assess each site's near-term and long-term mission needs. The LTS&M resource needs are based on historical costs in addition to the projected costs in the LCB.

5.3 Surveillance and Maintenance of ICs

LM employs an integrated approach to monitoring, physically assessing, and maintaining ICs as part of its regular site inspections. Monitoring and maintenance activities are performed in accordance with the approved LTS Plans for each respective site, and these activities can vary based on the laws, regulations, and programmatic requirements for each site depending on its regulatory authority or program as identified in Table 1.

Category 2 and Category 3 sites are visited regularly to assess any current or potentially changing conditions that might affect the protectiveness the remedy or impact human health and the environment. These activities provide opportunities to evaluate whether the assumptions made at the time the ICs were selected are still valid. The results of the regular inspections provide the basis for determining (a) whether the ICs should remain in place, (b) whether the ICs are no longer working effectively and need to be changed or modified, (c) whether or not the ICs are still needed to achieve their original purpose, and (d) whether an IC can be terminated or discontinued. As the potential site risks can extend indefinitely, the ICs at LM sites are not

usually terminated or discontinued but are modified to meet the changed site conditions to sustain protectiveness.

5.4 Enforcing ICs on LM Sites Under UMTRCA Title I, UMTRCA Title II, Decontamination and Decommissioning (D&D) Program, and Other Regulatory Authorities

There are several enforcement mechanisms for ICs on LM sites, depending on the category of the IC and its purpose in protecting human health and environment. There can be multiple parties with rights to enforce the ICs under various mechanisms. That is why it is important when layering ICs to understand not only the respective party's role in the creation and implementation of the ICs but also who has the right to enforce these instruments if the ICs are violated. Table 4 explains the potential enforcement process related to DOE Policy 454.1, *Use of Institutional Controls*. For example, an LM site might be subject to a state's environmental covenant (EC) law, which is a proprietary control, and have ICs identified within the LTSP or other required operations and maintenance plan, which is a regulatory enforcement mechanism. Most regulatory programs provide a process for dispute resolution that starts with the LM site manager and site regulator and then escalates to the heads of their respective departments.

When enforcement action is required, the LM site managers might need to consider whether and when the U.S. Department of Justice (DOJ) needs to be notified of such actions. While LM has access to the DOE Office of General Counsel if enforcement actions escalate to imposition of fines or stipulated penalties, DOJ would most likely need to be notified and involved in the resolution of such actions. The LM site managers should work with their respective team leads and the DOE Office of General Counsel to determine if and when to engage DOJ in an enforcement action.

Table 4. Potential Enforcement Mechanisms Associated with LM IC Categories and Types

Types of ICs	IC Authority and Examples	Potential Enforcement Processes
Administrative Controls IC Category		
Proprietary Controls	*State statutory and common law:* • Easements and covenants (for example, the EC at the Naturita processing site, State of Colorado EC, UECA) • Deed restrictions (for example, the Durango processing site)	The grantor of a proprietary control might be able to seek legal action against the grantee for prohibited activities. Even if it is not the grantor, DOE or any other state or federal agency might be able to enforce the proprietary control in states that have adopted legislation similar to the state's EC statutes if the definition of "agency" includes federal, state, and local governmental authorities. Most enforcement actions occur through lawsuits for breach of contract or enforcement under a state's law; however, many proprietary controls are also required in documents that are regulatory enforcement mechanisms, where the process for dispute resolution must be exhausted before filing a lawsuit.
Governmental Controls	• Zoning ordinances (for example, the Lakeview disposal site) • Well-drilling restrictions (for example, the Riverton processing site) • Building codes and permit requirements (for example, the New Rifle processing site) • Land withdrawal (for example, the Grand Junction disposal site LTSPs and LTS Plans) *Environmental or statutory mechanisms:* • Jurisdictional wetlands (for example, the Maybell West disposal site) • Cultural resources (for example, the Shiprock disposal site) • Endangered species habitat (for example, the Gunnison disposal site) • Floodplain regulations (for example, the Old Rifle processing site)	These controls are usually established and operate independently of the regulatory authority for cleanup, and they are enforceable by the governmental entity responsible for the restriction through an administrative process or legal action. The implementation and enforcement of these laws vary by jurisdiction. In addition, if a proprietary control is a requirement in these documents, the governmental entity can separately enforce it under the provisions of these documents, as well as the proprietary control document. The statute or regulation that requires the restriction identifies the enforcement authority. For example, the U.S. Fish and Wildlife Service enforces the Endangered Species Act of 1973 (16 USC 1531 et seq.).
Regulatory Enforcement Mechanisms	• NRC general licenses issued under 10 CFR 40 • LTSPs accepted under 10 CFR 40 • LTS Plans • Groundwater Compliance Action Plans	Depending on who is the lead regulatory authority, NRC and/or a state can enforce these controls on DOE through an administrative process under the applicable statute or regulation.

Table 4. Potential Enforcement Mechanisms Associated with LM IC Categories and Types (continued)

Types of ICs	IC Authority and Examples	Potential Enforcement Processes
Informational Controls IC Category		
Informational Devices	• Health advisories • Fish consumption advisories • Deed notices (for example, Salt Lake City processing site) • State registries of ECs (for example, Colorado, Pennsylvania) • Tracking systems • Signs	While informational devices typically are not enforceable, the site-specific circumstances might warrant action by DOE or another regulator.
Protectiveness Measures	• Fact sheets • Webpages • DOE Wellhead Security	LM can incorporate other measures that assist in fulfilling LM's stewardship mission and support LM's long-term responsibility to convey information about its sites.
Physical Controls IC Category		
Physical Controls	• Disposal cells • Fences • Site markers • Survey and boundary monuments • Wellhead security • Signs	Enforcement is accomplished through regular inspections to ensure the control is protective of human health and the environment, as designed.

Abbreviations:
CFR = *Code of Federal Regulations*
UECA = Uniform Environmental Covenants Act
USC = *United States Code*

6.0 ICs Guidance for LM Sites Under CERCLA and RCRA Authorities

6.1 Legal Framework for CERCLA and RCRA ICs

LM sites under CERCLA authority fall into two categories: sites that are listed on the "Superfund" National Priorities List (NPL) and sites that are not listed on the NPL. For sites on the NPL, DOE is the lead agency at federal facilities under the National Oil and Hazardous Substances Pollution Contingency Plan, which is also known as the National Contingency Plan (NCP)[1], and EPA—or EPA and DOE jointly—select the remedy. EPA is responsible for site listing and de-listing (deletion) decisions and for following federal CERCLA guidelines in Section 120(g), "Transfer of Authorities," and Section 120(h), "Property Transferred by Federal Agencies." In addition, EPA is responsible for entering into an interagency agreement (IA) (i.e., Federal Facility Agreement) with the appropriate federal lead cleanup agency, and that agency must meet its lead agency responsibilities. States play an important role at federal facility NPL sites and can be parties to the IA based on other EPA and state agreements. IAs in place during site cleanup are passed on to LM during site transition.

For those sites not on the NPL, Executive Order (EO) 12580, *Superfund Implementation*, delegates lead agency responsibility to DOE with respect to certain CERCLA response authorities for releases of hazardous substances on—or where the sole source of the release is from—sites under DOE's jurisdiction, custody, and control. LM takes over these responsibilities during the site's transition into its inventory.

RCRA is the primary law governing disposal of solid and hazardous waste. RCRA, which amended the Solid Waste Disposal Act of 1965 (PL 89-72), sets national goals for:

- Protecting human health and the environment from the potential hazards of waste disposal.
- Conserving energy and natural resources.
- Reducing the amount of waste generated.
- Ensuring that wastes are managed in an environmentally sound manner.

Three distinct, yet interrelated, programs are established by RCRA to achieve these goals:

- The solid waste program, under RCRA Subtitle D, encourages states to develop comprehensive plans to manage nonhazardous industrial solid waste and municipal solid waste, sets criteria for municipal solid waste landfills and other solid waste disposal facilities, and prohibits the open dumping of solid waste.
- The hazardous waste program (https://www.epa.gov/hw), under RCRA Subtitle C, establishes a system for controlling hazardous waste from the time it is generated until its ultimate disposal—in effect, from "cradle to grave."
- The underground storage tank program (https://www.epa.gov/ust), under RCRA Subtitle I, regulates underground storage tanks containing hazardous substances and petroleum products.

[1] See 40 CFR 300.5.

RCRA is prospective in application, unlike CERCLA, which is retroactive in liability to all former owners, operators, generators, or transporters of hazardous substances. EPA has authorized states to implement certain RCRA provisions in lieu of the federal government for certain hazardous waste programs. Most states have lead regulatory authority under RCRA. Some LM sites were subject to RCRA permit requirements if those sites had operations that treated, stored, and/or disposed of hazardous or solid waste and were remediated under RCRA Corrective Action.

FUSRAP's mission is to conduct actions that ensure the protectiveness of human health and the environment from long-lived radiological contaminants associated with past support to the Manhattan Engineer District and early U.S. Atomic Energy Commission activities. Until 1997, DOE cleaned up and managed FUSRAP sites under its Atomic Energy Act (AEA) authority. In 1997, responsibility for administration and execution of FUSRAP cleanup transferred from DOE to USACE, and that responsibility includes site characterization and remediation, as well as verification that the cleanup goals have been achieved at FUSRAP sites. DOE retained responsibility for determining site eligibility and managing site records. USACE conducts remediation of FUSRAP sites under CERCLA authority, as delegated by EO 12580, *Superfund Implementation*.

The NCP describes the regulations that implement CERCLA activities at both NPL and non-NPL sites, including those sites that are part of FUSRAP and were or are currently being remediated under the provisions of the Energy and Water Development Appropriations Act, 1998 (PL 105-62) and the Energy and Water Development Appropriations Act, 1999 (PL 105-245). The NCP incorporates ICs into the evaluation of remedial alternatives as part of a comprehensive strategy to achieve overall protection of human health and the environment. The NCP states that EPA expects to use treatment to address the principal threats posed by sites; use engineering controls for materials that pose relatively low risk or where treatment is impracticable; and use a combination of the two to protect human health and the environment, as specified in Title 40 *Code of Federal Regulations* (CFR) Section 300.430[a][1] [iii][A], [B], and [C]. In appropriate situations, a combination of treatment, containment, and ICs may be necessary. Sites currently being remediated by USACE under FUSRAP will use the CERCLA prescribed methodology for developing institutional controls. Those institutional controls are developed in coordination with the USACE prior to transition of the site to LM.

Sites under RCRA authority where the remedy does not allow for unrestricted use require implementation of ICs to protect human health and the environment. Under RCRA, authorized states are the primary decision makers, which results in a wide variety of state-specific regulatory mechanisms. EPA expects the use of a combination of methods (such as treatment, engineering controls, and other ICs) under RCRA to achieve protection of human health and the environment.

6.2 EPA Policy and Guidance on ICs

Since LM has several sites that are under CERCLA and RCRA authorities, for those sites only, LM follows the EPA guidance and policy documents on ICs. EPA has issued two main guidance documents and a number of policies that address planning, implementing, maintaining, and enforcing ICs with respect to site cleanup under CERCLA and RCRA at federal facilities. EPA defines ICs as non-engineered instruments, such as administrative or legal controls, that help to

minimize the potential for exposure to contamination or protect the integrity of a response action by limiting land or resource use. ICs:

- Are generally to be used in conjunction with, rather than in lieu of, engineering measures such as treatment or containment.
- Can be used during all stages of the cleanup process to accomplish various cleanup-related objectives.
- Should be layered (namely, use multiple ICs) or implemented in a series to provide overlapping assurance of protection from contamination.

EPA uses "land use controls" (LUCs) to define all types of controls, including engineering ICs, used at sites where the cleanup does not meet the standards for unrestricted use.

6.3 EPA IC Categories

Four categories of ICs are identified in EPA's guidance document (*Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites* [EPA 2012]) as well as in DOE Order 430.1C, *Real Property Asset Management*. The EPA IC categories are (1) proprietary controls, (2) governmental controls, (3) enforcement and permit tools with IC components, and (4) informational devices. The instruments associated with each IC category differ based on the parties involved in the process of establishing and enforcing these restrictions. The key concern in all cases is that the ICs prevent or mitigate the potential exposures and risks associated with the site contaminants.

Figure 2 provides an illustration of the EPA IC categories and includes some examples of the kinds of instruments and documents that fit into these categories. Table 5 lists the EPA IC categories and provides examples of the kinds of restrictions imposed and the definitions associated with each category.

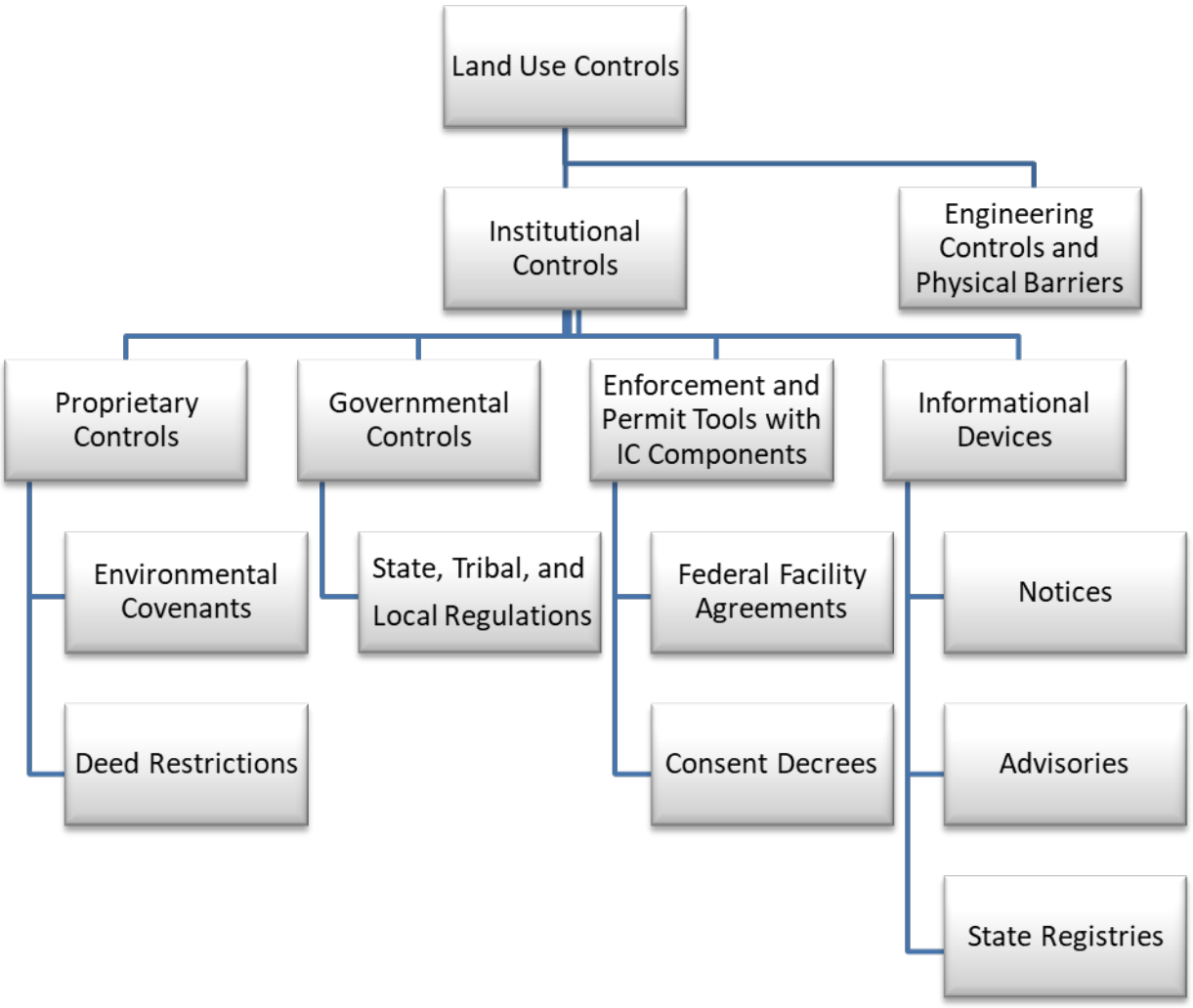


Figure 1. EPA IC Categories and Types

Table 5. EPA IC Categories and Types for CERCLA and RCRA Sites

IC Categories	Restrictions	Definition
Proprietary Controls	*State statutory and common law:* • Easements and covenants • Deed restrictions	Proprietary controls tend to affect a single parcel of property and document the land use restrictions through private agreements—usually between a landowner (grantor) and a second party (grantee). The grantor agrees to restrict access and activities to protect human health and the environment from residual contamination and to maintain the remedy, and the grantor has the right to enforce those restrictions. Because these types of agreements grant a property interest, the documents are recorded in the real property records of the appropriate city or county to give notice that these restrictions "run with the land" and are binding on future landowners or those who have a property interest. In general, state laws authorize these types of controls. For example, UECA has been adopted by 32 states, the District of Columbia, and the U.S. Virgin Islands. UECA was introduced in Alaska in 2018. UECA allows for the long-term enforcement of cleanup controls (such as restrictions on certain uses, prohibitions on using wells, protection of concrete caps, maintenance of monitoring equipment, and so on) to be contained in a statutorily defined EC that is binding on subsequent purchasers of the property and listed in the local land records. Several other states have adopted similar statutory EC laws that provide the same processes and protections as UECA. For reference, Table A- in Appendix A provides a list of those states that have enacted UECA laws, with the applicable citations, and Table A- provides a list of those states that have enacted laws similar to UECA that may be applicable to LM sites. The EPA guidance document, *A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites* (EPA 2012), notes that there are differences in the way ICs are applied at federally owned facilities with respect to transfer of property to nonfederal ownership. CERCLA, Section 120(h), "Property Transferred by Federal Agencies," requires a federal agency transferring property to a nonfederal agency to provide a covenant in the deed of transfer warranting that all remedial action necessary to protect human health and the environment has been taken before the date of transfer with respect to any hazardous substances remaining on the property, which can include identification of ICs in the deed of transfer from the federal agency to the nonfederal party. Under certain circumstances, this covenant can be deferred so the property can be transferred before all remedial actions are complete, with approval from the state in which the site is located. These covenants ensure the long-term effectiveness and permanence of the remedy because the federal agency remains ultimately responsible for monitoring, maintaining, and enforcing the ICs, even if these properties transfer out of federal ownership.

Table 5. EPA IC Categories and Types for CERCLA and RCRA Sites (continued)

IC Categories	Restrictions	Definition
Governmental Controls	*Governmental "police power"[a]:* • Zoning ordinances • Special Zoning District or Overlay • Well-drilling restrictions • Building codes and permit requirements • Commercial fishing bans; sports and recreational fishing limits • Federal ownership • Groundwater use restrictions	Governmental controls impose restrictions on large areas of land or on resource use through the police power authority of a government entity to protect the health, safety, and general welfare of the public.
	Environmental and statutory mechanisms: • Jurisdictional wetlands • Cultural resources • Historical sites • Endangered species habitats • Floodplain regulations	These statutory mechanisms are usually established and operated independently of the regulatory authorities utilized for cleanup, and they are enforceable by the federal, tribal, state, or local governmental entities responsible for the restriction.
Informational Devices	• Health advisories • Fish consumption advisories • Deed notices • State registry of sites with environmental covenants • Tracking systems • Recorded notices • Community involvement • Signs	Informational devices generally do not provide enforceable restrictions, although they inform the public about the site's history, residual risks, and the need to limit potential exposures. Most sites have some form of informational devices as part of the overall ICs layering strategy, such as site signage, the Superfund Enterprise Management System maintained by EPA, or a state EC registry.

Table 5. EPA IC Categories and Types for CERCLA and RCRA Sites (continued)

IC Categories	Restrictions	Definition
Enforcement and Permit Tools with IC Components	*Federal and state statutory law associated with the remedy:* • Superfund Consent Decrees, Unilateral Administrative Orders, Administrative Orders on Consent, Federal Facility Agreements, memorandums of agreement, and memorandums of understanding • RCRA orders and permits • Orders issued under state authority	These agreements are usually associated with the cleanup of a site, and they are based in federal or state law and enforced by the respective governmental agencies that are signatories to the document. These legal instruments can limit certain site activities or require the performance of specific activities associated with the response action or remedy at LM sites.
EPA LUCs		
EPA LUCs	• Disposal cells • Fences • Gates • Wellhead security	LUCs include both ICs as discussed above and engineering controls. Engineering ICs are designed for site-specific conditions to protect the remedy and isolate residual contamination or site hazards from the biosphere. They are manmade structures or barriers that limit access to a site.
LM Protectiveness Measures		
LM PMs	• Fact sheets • Webpages • Site markers	These measures, which are strictly informational and unenforceable, provide additional information at LM sites to inform the public and stakeholders about the site. LM can incorporate other measures at its sites to support its mission. These activities help LM fulfill its stewardship mission and support LM's long-term responsibility to convey information to the public and stakeholders.

Note:
[a] "Police Power" means state police power, which comes from the Tenth Amendment to the Constitution, which gives states the rights and powers "not delegated to the United States." States are granted this power to establish and enforce laws protecting welfare, safety, and health of the public.

Abbreviation:
UECA = Uniform Environmental Covenants Act

6.4 Long-Term Stewardship and Protectiveness Measures

EPA's IC guidance aims to ensure that the ICs placed on sites are effective and protective of human health and the environment. Long-term surveillance procedures should be in place to ensure the effectiveness of the ICs. Because of LM's mission to support the LTS&M activities at these sites and the long periods over which monitoring must occur to ensure there is no exposure from the residual contaminants, LM can incorporate other measures at its sites to support this mission. These activities also assist LM in fulfilling its stewardship mission and support LM's long-term responsibility to convey information about the site's history and associated information. Examples of PMs are fact sheets and webpages markers, which are used to convey site knowledge to the public and describe the historical significance of LM sites.

6.5 Planning and Development of ICs

EPA encourages full life-cycle planning for ICs to ensure their long-term protectiveness and encourages planning for ICs as early as possible in the remedial action process. ICs are developed based on identification of the potential residual risks or hazards at a site before, during, and after the remedial actions are performed. A baseline risk assessment is conducted as part of the Remedial Investigation and Feasibility Study process to help determine what risks need to be addressed by the remedial action. Interim ICs can be established during remediation to address short-term risks that will be eliminated by the final remedy. A risk evaluation is often conducted after completion of the remedial actions to estimate the residual site risks and determine the need for post remediation ICs. A similar process is followed during the RCRA Facility Investigation and Corrective Measure Study process to identify and assess the potential risks and exposures to human health and the environment. During these planning stages, EPA encourages communication with the state and local land-use planning authorities, as well as the public and other affected stakeholders, regarding the anticipated future land use and potential ICs.

LM generally performs an oversight role in the planning and development of ICs because most of the ICs are already identified or in place before a site transitions to LM. When sites are transitioning into LM, it is imperative that the assumptions regarding future site use are identified and documented. In the event that the land uses or exposure assumptions change, it is LM's responsibility to ensure that the site remains protective of human health and the environment, which could involve modifying the ICs.

6.6 Choice of Instrument and Layering of ICs

When ICs are identified and selected, the question arises as to what instrument or document should be used to establish them. *A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites* (EPA 2012) provides some general considerations, including the IC duration, the number of parcels to be restricted, whether landowners are willing to place ICs on their properties, and whether there is cooperation from state and local governments and agencies. Other considerations include who will be responsible for maintaining the ICs over the long term and the legal and practical limitations for LTS&M activities related to the ICs. Examples of instruments include an environmental covenants restriction that runs with the land so that the ICs are binding on future landowners, a permit to conduct certain activities at a site coupled with ICs that contain certain restrictions, an

Administrative Order on Consent that requires monitoring the ICs, and local zoning laws associated with the groundwater use restrictions.

As stated above, EPA encourages layering of ICs to ensure continuity of the remedial action and remedy. Some instruments can be enforced, while other instruments are notices. The layering of ICs should be robust enough to prevent or mitigate exposures and be commensurate with the risk to human health or the environment from exposures to residual contamination at a site and the length of time the ICs will be required (namely, temporary versus perpetual).

6.7 Monitoring and Maintaining ICs

A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites (EPA 2012) also provides useful information about how each type of IC is monitored and maintained to ensure its long-term effectiveness, based on the regulatory determinations associated with a site that are made during the CERCLA or RCRA cleanup. The IC maintenance activities assist in ensuring that the ICs are in place and functioning as intended. LM conducts periodic monitoring and maintenance of the ICs consistent with the site decision documents.

The types of ICs implemented at a site establish the baseline for any type of monitoring and maintenance activities to be performed. A typical site inspection might include determining whether the ICs are intact and undamaged, verifying compliance with required land use, and evaluating whether the ICs need to be modified or changed based on the current conditions at the site.

For CERCLA sites, the needed ICs are typically identified as part of remedy selection process and documented in the Record of Decision. The requirements for LTS&M activities at the site are incorporated in the post-closure documents, such as a Site Management Plan, ICs Plan, or Operations and Maintenance Plan. In addition, CERCLA sites that do not meet the standards for unrestricted use require reviews every 5 years until such standards are met. The five-year reviews include an assessment of all environmental remedies (including any ICs) and an evaluation of the status of site short-term and long-term protectiveness. One of the main reasons for reviewing these sites is that changes in land use can render the ICs less effective or unnecessary. LM does not always receive notice of land use changes in the areas surrounding sites that require LTS&M activities—particularly at sites not owned by LM. Periodic assessments are recommended, which should include a review of the current land uses and whether those uses have a direct effect on any potential risks and existing ICs at the site.

For example, some sites have adjacent residential communities that have grown over time, and such growth can affect the protectiveness of the ICs implemented at the time of site closure. In addition, the local zoning ordinances can change over time to accommodate different land uses that might not be consistent with the land use on which the ICs are based. In those situations, a periodic review of the zoning laws is useful to assess whether additional controls are needed to protect human health and the environment. For RCRA sites, the monitoring and maintenance requirements can be incorporated into a permit, Corrective Action Plan, or other separate document.

6.8 Enforcing ICs

There are several enforcement mechanisms for ICs on LM sites, depending on the type of ICs and their purpose in protecting human health and the environment. There can be multiple parties with rights to enforce the ICs under various mechanisms. For example, an LM site might be under an EPA Consent Decree (an enforcement tool), be subject to a state EC law (a proprietary control), and have a deed restriction that is required by CERCLA 120(h), "Property Transferred by Federal Agencies" (also a proprietary control). The preferred method and fastest way to obtain compliance with ICs is through voluntary compliance of the parties. Most Federal Facility Agreements or similar regulatory agreements provide a process for dispute resolution that starts with the LM site manager and site regulator and escalates to the heads of their respective departments.

Enforcement can occur in a number of ways based on the IC instruments and the authorities for their enforcement at the site. Some parties might be able to enforce multiple IC instruments under various statutes and regulations. Thus, it is important when layering ICs to understand the respective parties' roles in the creation and implementation of ICs and which party has the right to enforce these instruments if the ICs are violated. Table 6 is based on EPA's guidance and provides information to assist in understanding the potential enforcement processes related to ICs.

State-enacted EC laws are not generally seen as a regulatory "taking" associated with a property interest, since the state has an obligation to protect the public. The landowner, or grantor, must agree to have these restrictions placed on his or her property; however, the state retains enforcement authority for these covenants and/or restrictions. If landowners do not cooperate with placing environmental restrictions on their property, some states have the ability to place unilateral restrictive notices on environmentally impacted property to advise future landowners of the potential environmental hazards or restrictions. Most enforcement actions occur through lawsuits for breach of contract under a state's law, but sometimes a specified process for dispute resolution must be exhausted before filing a lawsuit.

Governmental controls are usually established and operate independently of the regulatory authorities, and they are enforceable by the governmental entity responsible for the restriction through an administrative process or legal action. Generally, state laws and local ordinances provide restrictions related to groundwater quality and water use, especially in the western states. The implementation and enforcement of these laws vary by jurisdiction.

There are a variety of environmental and statutory mechanisms in force at LM sites. These mechanisms are land use restrictions unrelated to site contamination that are required by state or federal law. Each one might be enforced by a different entity. The statute or regulation that requires the restriction identifies the enforcement authority. For example, the U.S. Fish and Wildlife Service enforces the Endangered Species Act of 1973 (Title 16 *United States Code* Section 1531 et seq. [16 USC 1531 et seq.]).

Table 6. Potential Enforcement Mechanisms Associated with EPA IC Categories for CERCLA and RCRA Sites

IC Categories	IC Authorities and Examples	Potential Enforcement Processes
Governmental Controls	*Governmental police power:* • Zoning ordinances (for example, zoning for commercial and industrial land use at the Colonie site) • Groundwater use restrictions (for example, the State of Texas municipal setting designations or groundwater-restricted areas established at the Monticello site) • Building codes or permit requirements associated with changes in land use • Well-drilling restrictions • Commercial fishing bans; sports and recreational fishing limits *Environmental and statutory mechanisms:* • Jurisdictional wetlands (for example, the Weldon Spring site) • Cultural resources (for example, the Monticello site) • Endangered species habitats (for example, the Rocky Flats site) • Floodplain regulations (for example, the Fernald Preserve site) • Historical sites	DOE would work with the appropriate parties to assist in any potential enforcement that may need to be pursued. Under state or local government jurisdiction, enforcement might be possible through an administrative process or legal action. For other federal laws and regulations and appropriate requirements associated with the remedy, enforcement might be possible through another federal agency.
Proprietary Controls	*Statutory and common law:* • Federal ownership • Easements and covenants (for example, the Declaration of Restrictive Covenant at the Pinellas County site or the State of Colorado ECs, UECA) • Deed restrictions (for example, the Falls City site, Grand Junction processing site, or Monticello site)	The grantor of a proprietary control might be able to seek legal action against the grantee for prohibited activities. DOE, EPA, the state, or another party might be able to enforce the proprietary control under state property law if it is a party to the agreement or a third-party beneficiary to the restriction, easement, or EC (for example the Declaration of Restrictive Covenants at Pinellas County site or the State of Colorado Restrictive Notice). Even if it is not the grantor, DOE or any other state or federal agency might be able to enforce the proprietary control in states that have adopted legislation similar to the state EC statutes if the definition of “agency” includes federal, state, and local governmental authorities. Most enforcement actions occur through lawsuits for breach of contract or under a state’s law; however, many proprietary controls are also required in enforceable documents and in permit tools with IC components, where a specific process for dispute resolution must be exhausted before filing a lawsuit.

Table 6. Potential Enforcement Mechanisms Associated with EPA IC Categories for CERCLA and RCRA Sites (continued)

IC Categories	IC Authorities and Examples	Potential Enforcement Processes
Informational Devices	• Health advisories • Fish consumption advisories • Deed notices that do not have enforcement provisions (for example, the Weldon Spring site) • State registries (for example, the New Jersey site) • Tracking systems (for example, state registries of properties with ECs, such as the Weldon Spring site) • Recorded notices • Community involvement • Signs	Information or notification must be provided to the public and stakeholders regarding residual onsite contamination. While informational devices typically are not enforceable, the site-specific circumstances might warrant action by DOE or another regulator.
Enforcement and Permit Tools with IC Components	*Federal and state statutory law associated with the remedy:* • Consent Decrees, Federal Facility Agreements, Administrative Orders on Consent, Unilateral Administrative Orders, memorandums of agreement, and memorandums of understanding (for example, the Monticello site) • RCRA orders and permits • Orders issued under state authority (for example, the New Brunswick site)	A variety of legal instruments require the responsible parties or signatories to control the use of land or resources. Most of these instruments have provisions for violations of these orders that are enforced by the lead regulatory authority for a site (such as EPA or the state) and include stipulated penalties, dispute resolution provisions, and emergency response provisions. In addition, as noted above, if a proprietary control is a requirement in the instrument, the lead regulatory authority can separately enforce the control under the provisions of the instrument, as well as under the proprietary control document.

Abbreviation:
UECA = Uniform Environmental Covenants Act

In 2006, EPA issued a memorandum with the subject "*Enforcement First" to Ensure Effective Institutional Controls at Superfund Sites* (EPA 2006a). While focusing on EPA's authority at Superfund sites, this memorandum provides insight into how EPA seeks to ensure compliance with the ICs placed at Superfund sites and ensure the ICs continue to be effective and protective of human health and the environment. EPA's options can include modifying the scope of work or the work plan, when necessary, to maintain and carry out the remedy set forth in the Record of Decision.

When enforcement action is required, LM site managers might need to consider when DOJ needs to be notified of such actions. While LM has access to the DOE Office of General Counsel if enforcement actions escalate to imposition of fines or stipulated penalties, DOJ would most likely need to be notified and engaged in the resolution of such actions. LM site managers should work with their respective team leads and the DOE Office of General Counsel to determine if and when to engage DOJ in an enforcement action.

7.0 Tracking of Institutional Controls

LM currently has a data collection utility (DCU), which it maintains to collection information on ICs at LM sites. The DCU has fields for the instrument type, the type of IC, the exact language from the instrument on what the IC is at the site, and the parties to these documents. The DCU is in the process of being updated and validated.

Utilizing the DCU data, LM is in the process of developing an ICs Tracking System (ICTS), which will provide a reporting mechanism for all LM ICs information. Many LM sites are already tracked in similar systems with EPA or by the respective state where a site is located.

8.0 ICs and Beneficial Reuse

ICs and beneficial reuse considerations vary by the regulatory authority under which the LM site was cleaned up and the LTS&M activities that are being conducted. LM's *Beneficial Reuse Management Plan* (BRMP) (DOE forthcoming) identifies, summarizes and explains LM's beneficial reuse criteria, screening and general procedures. The BRMP provides the framework for the Beneficial Reuse Management Program, including the goals, objectives, and matrix under which LM measures implementation of the program.

Sites are assessed during their transition to LM and are periodically reassessed for disposal and reuse potential, including potential additional uses of the land, while LM maintains ownership. Examples of beneficial reuse can include utilizing an LM site for renewable energy, repurposing it for commercial or industrial redevelopment, or creating areas that protect endangered wildlife and critical habitats. LM evaluates every reuse opportunity in accordance with the site's ICs and determines whether the proposed reuse is inconsistent with any of the required restrictions. In developing the appropriate regulatory documents or real property instruments that allow reuse, LM specifically addresses all of the restrictions to ensure compliance and protectiveness. The instruments can also contain any monitoring and maintenance requirements related to the changed conditions resulting from reuse activities.

In addition, LM periodically reviews the LTS&M requirements for LM-owned land and determines if any property is excess to LM's mission or needs. LM disposes of the land or property asset as the preferred reuse option. Before selecting this option, LM considers whether the land or property asset can be released and transferred to others while remaining protective of human health and the environment. If residual contamination is still a concern, LM ensures that the ICs will remain in place and in effect for as long as necessary. When considering the transfer, sale, lease, or change of management for any property or property right, LM must assess whether the property is subject to ICs, whether restrictions are in place on the property or property rights, consideration for any potential impacts to site security and the integrity of the remedy, and whether the restrictions are adequate and effective for protection of human health and the environment. Parties with economic development interests, local reuse authorities, local municipalities, LM realty officers, and LM site managers should be involved in identifying potential future reuses and considering the most protective and appropriate ICs for the long term.

9.0 Records Management and ICs

LM strives to preserve and disseminate knowledge about its sites, including knowledge of the site-specific ICs. As identified in Tables 3 and 5, ICs are often incorporated into realty documents and instruments. There are two types of LM files associated with real estate transactions: site records and real property files. Records, including site records, must be presented to the Archives and Information Management (AIM) team for proper retention. The LM Asset Management organization will often maintain real property working copies, including the copies of IC records, pertaining to LM sites and the associated interests and rights under LM's control. The LM Asset Management organization's working copies are maintained in a separate instance of Documentum.

Note

Real Property Management *(LMS/POL/S04335) provides the current processes for LM and LMS real property management, including record management.*

10.0 Real Property File Plan

Because LM maintains a real property interest in enforceable ICs, copies of all IC documents are maintained in the real property records as source documents. The file plan used by real property is designed to differentiate among the types of ICs, including enforceable ICs, notices, and notifications that provide information on past site activities or potential site contamination. Although there is a category in the real property working files for engineering controls, the most current and significant information regarding engineering and physical controls is entered in the Facilities Information Management System (FIMS). FIMS maintains current information on all physical and engineered controls that must be monitored and maintained for protectiveness of human health and the environment, as well as all source documents (DOE 2018a).

11.0 Definitions

The following terms and their definitions are provided as a reference for this guide. Many of these terms have multiple definitions, depending on the source document utilized. DOE Order 430.1C, *Real Property Asset Management*, was the source document utilized for most of these terms.

acquisition: The process of gaining ownership or control of real property or of an interest in real property.

assessment: A periodic review of an IC's effectiveness and the potential for its modification or termination.

Atomic Energy Act (AEA): Section 161(g) of the Atomic Energy Act of 1954, as amended (42 USC 2201(g)), provides the Secretary of Energy with the authority to acquire, purchase, lease, and hold real and personal property and to sell, lease, grant, and dispose of such real and personal property "as provided in this Act." Further transactions are not subject to the U.S. General Services Administration's disposal requirements under the Federal Property and Administrative Services Act of 1949, as amended (PL 152). The DOE Office of General Counsel has interpreted "as provided in this Act" to require that any disposal under Section 161(g) must relate to property that: (a) DOE has acquired in connection with carrying out its objectives under the AEA; or (b) property that will be used or disposed to carry out such functions and objectives. Section 161(g) does not impose any fair market value requirement, since the authorized means of disposal includes "grant," as well as "sell" and "lease." A transfer at no cost is considered a sale at less than the fair market value for the purposes of notification.

beneficial reuse: For LM, the productive use of an LM-managed site that no longer has a mission after remediation by LM or other entities while remaining protective of human health and the environment. Reuse activities maintain protective use of lands and remedies, including revitalization of real property and disposal of land. The two main elements of reuse are:

- **Protectiveness:** The activities are compatible with long-term maintenance of the remedy and ensure protection of public health and the environment.
- **Environmentally Sound:** The activities ensure good stewardship of natural resources.

certified realty specialist (CRS): A DOE employee in the realty specialist series who is certified in one or more of the three specialty areas: (a) acquisition, (b) leasing, or (c) land management and disposal. Federal employees so certified are authorized to prepare and implement real estate actions within their certified specialty areas and to provide the required review and approval before execution by a DOE official with delegated authority for real estate actions. Detailed guidance and procedures for becoming a CRS are available at: https://powerpedia.energy.gov/wiki/Certified_Realty_Specialist

community monitoring: Actions by local residents who have a vested interest in their community and can report valuable information related to IC or PM compliance when made aware of the restrictions.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 USC 9601 et seq.): CERCLA provides broad federal authority to respond directly to releases or threatened releases of hazardous substances that might endanger public health or the environment. CERCLA:

- Provides prohibitions and requirements concerning closed and abandoned hazardous waste sites.
- Ensures the liability of persons responsible for release of hazardous waste at these sites.
- Provides a trust fund to enable site cleanup when no responsible party can be identified.

CERCLA authorizes two kinds of response actions:

- Short-term removal actions, where actions can be taken to address releases or threatened releases requiring prompt response.
- Long-term remedial response actions that permanently and significantly reduce the dangers associated with releases or threats of releases of hazardous substances that are serious but not immediately life threatening. These actions can be conducted only at sites listed on EPA's NPL.

Consent Decree: A legal document, approved by a judge, that formalizes a settlement reached between EPA and the responsible parties through which the responsible parties will conduct all or part of a cleanup action at a Superfund site, cease or correct actions or processes that are polluting the environment at a site, or otherwise comply with an EPA-initiated enforcement action. The Consent Decree describes the actions to be taken by the responsible parties.

conveyance: Transfer of title to property (any variety of deed, such as a quitclaim or warranty) or an interest in property (such as an easement). Any conveyance can include restrictions on land use or activities.

cost: A monetary valuation of effort, material, resources, time and utilities consumed, risks incurred, and opportunity forgone in production and delivery of a good or service.

covenant: A promise by a landowner made to another party to take or refrain from taking certain actions. Covenants fully describe the restrictions that apply to specific parcels of property, are recorded in county records, and are binding on all future landowners. They contain provisions for notification, modification, and termination. Several states have enacted laws that empower the state to place restrictions on land to protect the remedy, human health, and the environment.

deed: A written instrument by which a person transfers ownership of real property to another.

deed notice: Commonly a non-enforceable, purely informational instrument within a deed or recorded with a deed. For LM's purposes, deed notices can provide background information about a former site's activities and provide information about residual contamination at the site. In some states, a deed notice can be enforceable and might be considered the mechanism of choice to convey ICs.

deed restriction: The restrictions in any proprietary conveyance.

disposal: Permanent transfer of DOE control and custody of real property assets to a third party who thereby acquires the rights to control, use, or relinquish the property.

easement: The right to use land belonging to another for a specific purpose, with the owner retaining title. The owner's use is restricted to activities that will not interfere with the purposes for which the easement was granted.

enforcement: An action taken by an authority, whether governmental or third party, to enforce the terms and conditions of an IC. Such enforcement can be through a legal or regulatory process.

event: Elements or attributes that describe the details of an IC event (for example, an inspection, finding of an IC failure, resolution of an IC failure, site-wide assessment of ICs).

excess real property: Real property assets no longer required to support LM's needs, present or future missions or functions, or the discharge of its responsibilities. A real property asset can remain in LM's custody and control with residual or incidental use pending final disposal between the time it was determined to be excess and removal of the asset from LM's real property inventory. Excess real property carries a designation of "Yes" in the **Excess Indicator** field in FIMS.

grantee: The person to whom an interest in real property is conveyed.

grantor: The person who conveys an interest in real property.

institutional controls: (ICs): Institutional controls (ICs) are defined in a variety of different ways depending on the regulatory authority or program applicable to a particular site. The following are some of the interpretations of what ICs means within DOE Orders, Guidance and Policy:

DOE O 430.1C, *Real Property Asset Management*, states: *non-engineering measures intended to affect human activities in such a way as to prevent or reduce exposure to hazardous substances. Institutional controls are almost always used in conjunction with, or as a supplement to, other measures such as waste treatment or containment. There are four categories of institutional controls: governmental controls; proprietary controls; enforcement and permit tools with institutional controls components; and information devices. For this Order, institutional controls are those governmental controls such as deed notifications, easements, use restrictions, leases and other property interests that are inventoried as records and notes in records in the Facilities Information Management System.*

DOE Policy 454.1 and Guidance states: *The term "institutional controls" has diverse, and often not consistent, meanings, depending on the driver for the controls. DOE P 454.1 does not define the term "institutional controls" but rather, applies the term broadly so as to encompass all topic-specific regulations and guidance documents and the various institutional controls used throughout DOE in a consistent yet flexible, policy framework. Under DOE P 454.1 "institutional controls" may include administrative or legal controls, physical barriers or markers, and methods to preserve information and data and inform current and future generations of hazards and risks. DOE P 454.1 does not intend to alter the definition of*

"institutional controls" in existing laws, regulations or guidance documents, but instead to emphasize that: 1) diverse uses, requirements and definitions of institutional controls exist; 2) institutional controls may overlap and differ; and 3) institutional controls need to be integrated effectively on a site-wide basis. See *Institutional Controls Implementation Guide for Use with DOE P 454.1, Use of Institutional Controls,* also known as "DOE Guidance," page I-2.

FIMS Dictionary states: *Land not owned by DOE but upon which DOE imposes/enforces administrative or legal controls (e.g. easements or use restrictions), physical barriers or markers, and other methods to preserve information and data to inform current and future generations of hazards and risks.*

Institutional Controls Tracking System (ICTS): The ICTS is a tracking system developed for LM to contain all IC-related information. The ICTS will be used to collect data on ICs at LM sites; generate checklists for use by LM and LMS personnel as they monitor, inspect, and maintain ICs on the frequency specified by the LM site manager; and serve as the electronic repository for specifics about IC events, such as periodic assessments of IC efficacy and details of IC findings, failures, and resultant resolutions.

instrument: General term used for a legal real property document that conveys land or an interest in land.

Integrated Safety Management System: This system describes the processes through which the LMS contractor integrates safety into LMS work practices at all levels so that the mission is accomplished while protecting workers, the public, and the environment. The process of integrating safety begins during project planning, continues through work execution, and ends with a formal post work review. The LMS *Integrated Safety Management System Description* (LMS/POL/S14463) was written to meet the expectations identified in DOE Policy 450.4A, *Integrated Safety Management Policy*.

land use controls (LUCs): A term used by EPA to define all ICs, including engineering controls and physical barriers.

layering: The use of different types of ICs at the same time to enhance awareness or protectiveness at or near a site.

l**ong-term stewardship (LTS):** Under DOE Order 430.1C, *Real Property Asset Management*, "long-term stewardship" includes the ICs and other mechanisms needed to ensure protection of human health and the environment at sites where LM has completed or plans to complete cleanup (for example, landfill closures, remedial actions, removal actions, and facility stabilization). This concept includes ICs, LUCs, monitoring, maintenance, and information management.

management: Under DOE Order 430.1C, *Real Property Asset Management*, the safeguarding of the government's interest in property in an efficient and economical manner consistent with the best business practices (41 CFR 102-71.20).

monitoring: A means of observing, checking, or keeping a continuous record of a process or quantity.

National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR 300): The NCP is the federal government's strategy for responding to oil spills and hazardous substance releases. These requirements outline the steps that EPA must take when responding to situations when oil has been discharged into or on the navigable waters of the United States or when hazardous substances, pollutants, or contaminants have been released into the environment. The NCP is the primary regulation of the Superfund Program.

Nuclear Waste Policy Act (NWPA) (42 USC 10101 et seq.): NWPA supports the use of deep geologic repositories for the safe storage or disposal of radioactive waste. NWPA establishes procedures to evaluate and select sites for geologic repositories and to facilitate the interaction of state and federal governments. NWPA assigns DOE the responsibility to select the site, build, and operate a deep geologic repository for disposal of high-level waste and spent nuclear fuel. It directs EPA to develop standards for protection of the general environment from offsite releases of radioactive material in repositories. NWPA directs NRC to license DOE to operate a repository only if it meets EPA's standards and all other relevant requirements.

overlay zone: A set of zoning regulations that supplement (overlay) those of the underlying district. Developments within an overlay zone must comply with the requirements of both zones or with the more restrictive of the two. Typically, overlay zones are used for large areas or for areas owned by multiple landowners and for addressing issues such as widespread groundwater contamination.

personal property: Items that can be moved or are not permanently affixed to or part of real property, including equipment, signs, and vehicles. Personal property includes those items that can be moved without seriously damaging the value of either the real property or the items themselves.

real estate: Under DOE Order 430.1C, *Real Property Asset Management*, land plus any natural or artificial (manmade) improvements that are attached or have been added.

real estate contracting officer (RECO): Under DOE Order 430.1C, *Real Property Asset Management*, a RECO is a CRS who has been issued a contracting officer's warrant to execute real estate actions within prescribed limits.

real property (real estate): Land and rights in land (such as easements and rights-of-way), improvements to the land (such as roads and wells), utility distribution systems, and those things attached to the land. The chief characteristics of real property are immobility and tangibility, which comprise the land and all things of a permanent and substantial nature affixed to it, whether natural (trees and natural resources) or man-made (roads and buildings).

record: All recorded information, regardless of form or characteristics, made or received by a federal agency under federal law or in connection with the transaction of public business and preserved or appropriate for preservation by that agency or its legitimate successor as evidence of the organization, functions, policies, decisions, procedures, operations, or other activities of the United States Government or because of the informational value of data in them. Includes recorded information created, manipulated, communicated or stored in digital or electronic form.

regulatory driver: The law, regulation, or program under which a site is remediated and/or closed.

residual contamination: Contamination remaining on a site after cleanup has been completed to the extent practicable. Typical residual contamination includes deep radioactive contamination below any usable water table and low-level groundwater contamination plumes.

Resource Conservation and Recovery Act (RCRA) (42 USC 6901 et seq.): RCRA establishes the framework for a national system of solid waste control. Subtitle D is dedicated to nonhazardous solid waste requirements, and Subtitle C focuses on hazardous solid waste. Solid waste includes solids, liquids, and gases that must be discarded to be considered waste. EPA translates this direction in RCRA into operating programs by developing regulations, guidance, and policy. States play the lead role in implementing nonhazardous waste programs under Subtitle D. EPA has developed regulations to set minimum national technical standards for how disposal facilities should be designed and operated. States issue permits to ensure compliance with EPA and state regulations.

run with the land: A term signifying that an instrument (in the case of ICs, a proprietary control) binds all subsequent owners to the conditions contained in the instrument, including any successors and assigns to the real property interests that might be transferred.

source document: The original document or a copy of the original document that substantiates LM's real property right (for example, a deed, easement).

stakeholder: An interested party who has an interest or concern in site conditions and maintenance. Owners of adjacent land can play an essential role in maintaining ICs by informing LM of site conditions and occurrences that might indicate compromised protectiveness. Stakeholders might also be available to acquire information on site conditions from remote sites if LM needs information quickly (for example, in response to severe weather, a wildfire, or an earthquake).

surveillance and maintenance: Activities under DOE Order 430.1C, *Real Property Asset Management,* that are conducted during a period of asset dormancy when the facility is inactive. These activities maintain the facility's safety envelope and can include periodic inspection and maintenance of structures, systems, and equipment to ensure that, at a minimum, any contamination is adequately contained and the potential hazards to workers, the public, and the environment are eliminated or mitigated and controlled.

transfer: Under DOE Order 430.1C, *Real Property Asset Management*, turning a real property asset or site over to another office within DOE for reuse or to support transition of it from one disposition phase to another.

transition: The transfer of sites managed under various DOE programs to LM for LTS&M activities from the parties responsible for site cleanup under a particular regulatory authority.

12.0 References

10 CFR 40. "Domestic Licensing of Source Material," *Code of Federal Regulations*.

40 CFR 192. "Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings," *Code of Federal Regulations.*

40 CFR 300. "National Oil and Hazardous Substances Pollution Contingency Plan," *Code of Federal Regulations.*

41 CFR 102. "Public Contracts and Property Management," Subchapter C, "Real Property," *Code of Federal Regulations.*

PL 89-72. "Solid Waste Disposal Act of 1965" as amended," Public Law.

PL 95-604. "Uranium Mill Tailings Radiation Control Act of 1978," Public Law.

PL 105-62. "Energy and Water Development Appropriations Act of 1998," Public Law.

PL 105-245. "Appropriations Act for Fiscal Year 1999," Public Law.

PL 106-60. "Appropriations Act for Fiscal Year 2000," Public Law.

PL 152. "Federal Property and Administrative Services Act of 1949" as amended, Public Law.

16 USC 1531 et seq. "Endangered Species Act of 1973," *United States Code*.

42 USC 2201. "Atomic Energy Act of 1954" as amended, *United States Code*.

42 USC 6901 et seq. "Resource Conservation and Recovery Act of 1976" as amended, *United States Code*.

42 USC 9601 et seq. "Comprehensive Environmental Response, Compensation, and Liability Act of 1980" as amended, *United States Code*.

42 USC 10101 et seq. "Nuclear Waste Policy Act of 1982," *United States Code*.

DOE (U.S. Department of Energy), 2005. *Development of Site Transition Plan, Use of Site Transition Framework, and Terms & Conditions for Site Transition*, memorandum of understanding between U.S. Department of Energy and Office of Environmental Management, February 15.

DOE (U.S. Department of Energy), 2012. *Guidance for Developing and Implementing Long-Term Surveillance Plans for UMTRCA Title I and Title II Sites*, LMS/S00336, Office of Legacy Management, November.

DOE (U.S. Department of Energy), 2016a. *2016–2025 Strategic Plan*, DOE/LM-1477, May.

DOE (U.S. Department of Energy), 2016b. *Process for Transition of Uranium Mill Tailings Radiation Control Act Title II Disposal Sites to the U.S. Department of Energy Office of Legacy Management for Long-Term Surveillance and Maintenance*, LMS/S05096, Office of Legacy Management, April.

DOE (U.S. Department of Energy), 2018a. *Facilities Information Management System User's Guide*, November 5.

DOE (U.S. Department of Energy), 2018b. *LM Site Management Guide*, Office of Legacy Management, March.

DOE (U.S. Department of Energy), forthcoming. *Beneficial Reuse Management Plan*, Office of Legacy Management, to be published.

DOE and USACE (U.S. Department of Energy and U.S. Army Corps of Engineers), 1999. *Program Administration and Execution of the Formerly Utilized Sites Remedial Action Program Memorandum of Understanding*, March 17.

DOE Guide 454.1-1, *Institutional Controls Implementation Guide for Use with DOE P 454.1, Use of Institutional Controls*, U.S. Department of Energy, October 14, 2005.

DOE Order 430.1C, *Real Property Asset Management*, U.S. Department of Energy, August 19, 2015.

DOE Order 458.1 Admin Chg 3, *Radiation Protection of the Public and the Environment*, U.S. Department of Energy, January 15, 2013.

DOE Policy 450.4A, *Integrated Safety Management Policy*, U.S. Department of Energy, April 25, 2011.

DOE Policy 454.1 Admin Chg 1, *Use of Institutional Controls*, U.S. Department of Energy, December 7, 2015.

EO (Executive Order) 12580. *Superfund Implementation*, January 23, 1987.

EPA (U.S. Environmental Protection Agency), 2000. *A Site Manager's Guide to Identifying, Evaluating and Selecting Institutional Controls at Superfund and RCRA Corrective Action Cleanups*, EPA 540-F-00-005, OSWER 9355.0-74FS-P, September.

EPA (U.S. Environmental Protection Agency), 2006a. "*Enforcement First" to Ensure Effective Institutional Controls at Superfund Sites*, OSWER 9208.2, March 17.

EPA (U.S. Environmental Protection Agency), 2012. *Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites*, EPA 540-R-09-001, OSWER 9355.0-89, December.

Integrated Safety Management System. LMS/POL/S14463, continually updated, prepared by Navarro Research and Engineering, Inc., for the U.S. Department of Energy Office of Legacy Management.

Real Property Management. LMS/POL/S04335, continually updated, prepared by Navarro Research and Engineering, Inc., for the U.S. Department of Energy Office of Legacy Management.

Uniform Environmental Covenants Act of 2003 (see Table A-1 in Appendix A).

13.0 Bibliography

The following supplemental references are provided related to this guide.

DOE (U.S. Department of Energy), 2005. Memorandum for Field Distribution, *Development of Site Transition Plan, Use of the Site Transition Framework, and Terms and Conditions for Site Transition*, Michael W. Owen and Paul M. Golan, February 15.

DOE (U.S. Department of Energy), 2005. *Site Transition Framework for Long-Term Surveillance and Maintenance*.

EPA (U.S. Environmental Protection Agency), 1995. *Policy on Decommissioning of Department of Energy Facilities under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).*

EPA (U.S. Environmental Protection Agency), 2002. *Reusing Superfund Sites: Commercial Use Where Waste Is Left on Site*, EPA 540-K01-008, OSWER 92300.0-100, Office of Emergency and Remedial Response, February.

This page intentionally left blank

Appendix A

States That Have Enacted UECA and States That Have Enacted EC Laws Similar to UECA

This page intentionally left blank

Table A-1. States That Have Enacted UECA

State	Date Adopted	Reference
Alabama	January 1, 2008	Alabama Code, Section 35-19-1 et seq. ADEM Administrative Code Section 335-5
Delaware	July 21, 2005	Delaware Code Ann. Tit. 7, Chapter 7, Subchapter II
District of Columbia	May 12, 2006	District of Columbia Code Title 8, Subtitle A, Chapter 6C, Section 8-671.01 et seq.
Georgia	2008	Georgia Code Ann., Section 44-16-1 et seq.
Hawaii	July 2006	Hawaii Revised Statutes, Section SOSC-1 et seq.
Idaho	2006	Idaho Code, Section 55-3001 et seq.
Illinois	January 1, 2009	Illinois Compiled Statutes, Chapter 765, Section122
Iowa	2006	Iowa Administrative Code, Section 567-14-1
Kentucky	2005	Kentucky Revised Statutes, Part 224, Subchapter 80
Maine	June 10, 2005	Maine Revised Statutes, Title 38, Section 3001 et seq.
Maryland	2005	Maryland Code, Environmental, Sections 1–801 et seq.
Minnesota	2007	Minnesota Statutes, Section 114E
Mississippi	March 31, 2008	Mississippi Code, Section 89-23-1 et seq.
Missouri	January 1, 2008	Missouri Ann. Statute, Sections 260.1000–260.1039
Nebraska	September 3, 2005	Nebraska Revised Statutes, Sections 76-2601–76-2613
Nevada	June 13, 2005	Nevada Revised Statutes, Section 445D.010 et seq.
Ohio	December 30, 2004	Ohio Revised Code, Sections 5301.80–5301.92
Oklahoma	January 1, 2007	Oklahoma Statutes, Title 60, Section 49.11 et seq.
Pennsylvania	February 19, 2008	Pennsylvania Statutes Ann., Title 27, Section 6501 et seq.
South Dakota	June 1, 2005	South Dakota Codified Laws, Section 34A-17-1 et seq.
Utah	2006	Utah Code, Sections 57-25–101 et seq.
Virgin Islands	June 28, 2006	Title Twenty-Eight Property, Chapter 18, Uniform Environmental Covenants Act of 2006, 28 Virgin Islands Code, Section 391 (2011)
Virginia	2010	Virginia Code Ann., Sections10.1–1238 et seq.
Washington	July 22, 2007	Washington Revised Code, Section 64.70.005 et seq.
West Virginia	2005	West Virginia Code, Section 22–228-1 et seq.

Table A-2. States That Have Enacted EC Laws Similar to UECA

State	Date Adopted	Reference
Arizona	1995, Amended 2003 2000, Amended 2003	Arizona Revised Statutes, Section 49-152 Arizona Revised Statutes, Section 49-158
California	1995, Amended 2002 2003, Amended 2007	California Health and Safety Code, Sections 25355.5, 25221, and 25395.99 California Civil Code, Section 1471 California Code of Regulations, Title 22, Section 67391.1
Colorado	Amended 2008	Colorado's Hazardous Waste Act, Sections 25-15-317 to 327 Colorado Revised Statutes (created by SB 145 and SB 37)
Connecticut	June 7, 1994 January 30, 1996	Connecticut General Statutes, Sections 22a-133n to 22a-133r Regulations of Connecticut State Agencies, Section 22a-133q-1
Indiana	2001, Amended 2009 2001, Amended 2009	Indiana Code, Section 13-11-2-193.5, Definition of “restrictive covenant” Indiana Code, Section 13-14-2-6 Indiana Code, Section 13-25-4-24 Indiana Code, Section 13-25-5-5-8.5(e)
Kansas	July 1, 2003	Kansas Statutes, Sections 65-1,221 through 65-1,235
Massachusetts	1988, Amended 2007	310 Code of Massachusetts Regulations, Sections 40.00 and 40.1070
Michigan	Amended December 14, 2010	Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, PA 451 of 1994; Section 20114c(3)
Montana	1999	Montana Code, Section 75·10.727
New York	December 14,2006	6 NYCRR, Part 375·1.8(h)(2)
North Carolina	1999, Amended 2007	North Carolina General Statutes, Sections 1438-279.9 and 1436-279.10
North Dakota	March 2005	North Dakota Century Code, Section 23·20.3.03.1
Oklahoma	1976, Amended 1978, 1993, 2000, 2004, 2005, and 2009	Oklahoma Statutes, Title 27A, Section 2-7·123
Oregon	1995	Oregon Revised Statutes, Section 465.210
Rhode Island	1995, Amended 2009	Rhode Island General Laws, Section 23-19.14-1 et seq.
South Carolina	2007	South Carolina Code Ann., Section 30-5-36 and Sections 27-50-10 to -110
Texas	Amended September 23, 1999 September 1, 2003	30 Texas Administrative Code, Section 335.551 et seq. 30 Texas Administrative Code, Section 350.1 et seq.

Appendix B

Planning Checklist for ICs

This page intentionally left blank

Planning Checklist for ICs

During the planning phase, the items listed below are considered and documented in the site records.

Site Name:_____

Institutional Controls Checklist for Protection of Human Health and Environment		
Action	**Complete**	**Documentation**
Description of media and contaminants exceeding UU/UE criteria (media, contaminants, concentration data)		
Standards, guidelines, and benchmarks used for screening		
Site-specific risk assessment assumptions, if applicable		
Expected future land use (end state)		
Consequences if no ICs		
Surface restrictions required		
Subsurface restrictions required		
Duration required for each restriction		
Criteria for release of each restriction, if applicable		
Map(s) with extent and distribution of media exceeding UU/UE criteria		
Map(s) showing extent of IC boundaries		
Surveillance, monitoring, and maintenance requirements and frequency		
How are failures detected?		
How will IC effectiveness be measured?		
Reporting requirements		
Requirements for notification of a failure		
Frequency of review of adequacy of ICs		
Institutional Controls Checklist for Protection of Engineering Control or Other Resource		
Action	**Complete**	**Documentation**
Description of feature requiring protection, including performance requirements of key components (e.g., permeability of cover material)		
Map/as-built showing location and construction information		
Expected future land use (end state)		
Consequences if no ICs		
Surface restrictions required		
Subsurface restrictions required		
Duration of ICs		
Map(s) showing extent of IC boundaries		
Frequency of Inspection		
How are failures detected?		
How will IC effectiveness be measured?		
Monitoring requirements		
Reporting requirements		
Requirements for notification of a failure		
Frequency of review of adequacy of ICs		

This page intentionally left blank