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Revision 0

Hanford Long-Term Stewardship Program and Transition:

Preparing for Environmental Management Cleanup Completion

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

United States Department of Energy
P.O. Box 550
Richland, Washington 99352

Project Hanford Management Contractor for the
U.S. Department of Energy under Contract DE-AC06-96RL13200

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Chris B. Willingham 8/6/03
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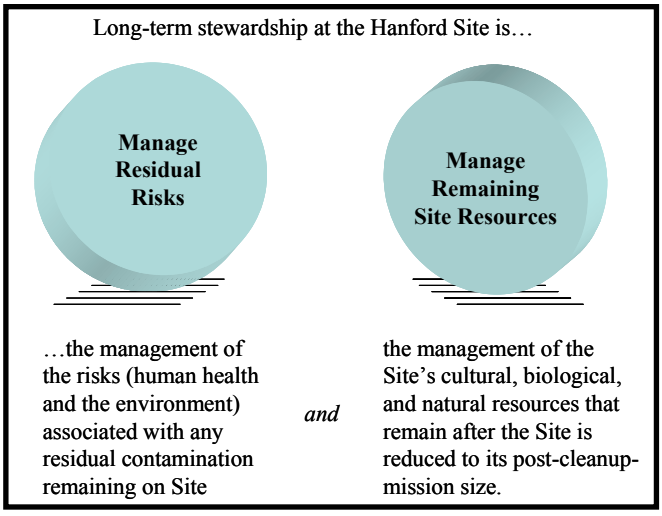
EXECUTIVE SUMMARY

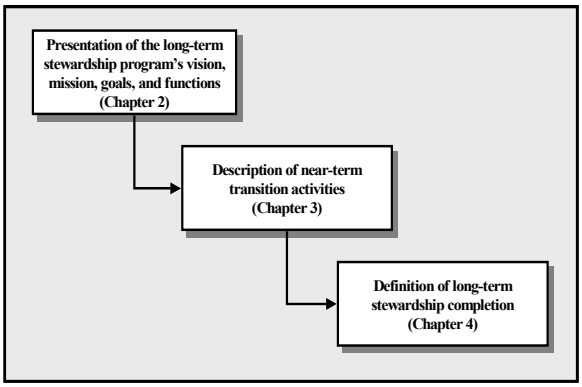
Fundamental decisions being made today will define the future landscape of the Hanford Site. As the U.S. Department of Energy (DOE) accelerates cleanup, reduces risks, and transfers major portions of the Site out of its administrative control, preparing for transition to long-term stewardship (LTS) will become a significant responsibility. At the Hanford Site, an LTS program will start at the end of the DOE, Office of Environmental Management (EM) cleanup mission to manage the risks associated with residual contamination and the Site's resources that remain after DOE disposes of surplus lands (see Figure ES-1). This document describes the future post-cleanup LTS program, identifies the near-term preparations for transition to LTS, and defines when LTS is complete. DOE is committed to a successful transition to, and conduct of, LTS. This document may be updated to reflect the evolving issues related to LTS.

ES-1. The Definition of Long-Term Stewardship.



It is important at this time for DOE to define the program that will enable DOE to meet its post-cleanup obligations and initiate actions to prepare for the transition to LTS. While the surface footprint of the active Site will shrink, some residual contamination will remain below soil covers, engineered "caps" will cover waste disposal sites, and a significant amount of contaminated groundwater is anticipated to remain. As a result, DOE will be required to maintain and monitor the soil covers, engineered caps, and an extensive network of groundwater monitoring wells, in addition to preventing excavations and unauthorized use of the groundwater and ensuring access to the Site is controlled as appropriate. These requirements are just a few of the obligations that the LTS program will address to protect human health and the environment after the completion of the cleanup mission.

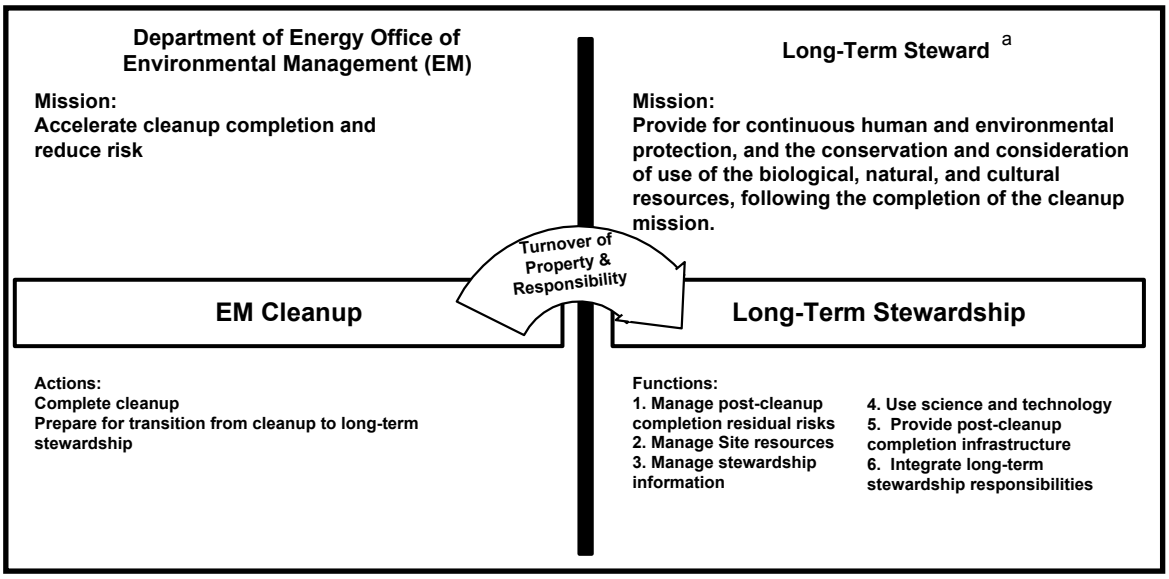
ES-2. The Long-Term Stewardship Framework.



This document, the *Hanford Long-Term Stewardship Program and Transition: Preparing for Environmental Management Cleanup Completion* (Hanford Long-Term Stewardship Program and Transition), establishes the framework for a successful LTS program and identifies the initial transition preparation activities that must begin now in order to create a successful future program (see Figure ES-2). This document also describes when LTS ends. The *Hanford Long-Term Stewardship Program and Transition* was built from the mission level to the implementation level, with input from DOE and regulatory agencies, Tribal Nations, Hanford Advisory Board workshops, and the products of other national stakeholder workshops on this subject, as well as comments received from the public on the working draft of this document. The *Hanford Long-Term Stewardship Program and Transition* is to be used as an internal DOE management tool. The strategies and actions presented in this document do not impose any legal or regulatory obligations.

Beginning with the end in mind, the *Hanford Long-Term Stewardship Program and Transition* is built on a vision that describes a broadly agreed-upon picture so the reader may understand and believe in a valued, mutual destination (Chapter 2). The LTS vision at the Hanford Site is that the vitality of human, biological, natural, and cultural resources be sustained over multiple generations. The LTS program's purpose is defined in its mission statement: "to provide for continuous human and environmental protection, and the conservation and consideration of use of the biological, natural, and cultural resources following the completion of the cleanup mission." The goals of the LTS program incorporate input provided during a series of public workshops regarding LTS. The values developed at the strategic level—the vision, mission, and goals—are integrated into six LTS functions (see Figure ES-3).

Figures ES-3. Preparing for the Transition to Long-Term Stewardship.



[a] The long-term steward for DOE-managed land will be a DOE program secretarial office other than the Office of Environmental Management. The long-term steward for land that is excessed from DOE will be the entity receiving the land (federal, state, or private entity). Although the functions shown in the figure are the functions anticipated for DOE's long-term stewardship program, a non-DOE long-term steward may perform similar functions. As a result, the planned transition activities described in this document will be applicable to land undergoing cleanup, whether the land will ultimately be managed by DOE or by another entity.

To prepare for the transition from cleanup to LTS, DOE identified the near-term actions (in the next 5 years) that need to be taken prior to the completion of the cleanup mission. These actions (Chapter 3), identified through a basic project programmatic risk analysis, illustrate DOE's continued commitment to ensuring that it meets its post-closure obligations in a compliant and cost-effective manner. Of the 16 actions identified, the 5 listed in Figure ES-4 are the high-priority actions that must be initiated in the near term. A DOE project plan will be developed for the near-term actions to describe the functions, roles, responsibilities, and schedule for the transition preparation. The transition actions will help to ensure the following:

- DOE's commitment to meet its long-term, post-cleanup obligations is reaffirmed and that its planning efforts to comply with those obligations are visible
- The interface between the cleanup program and the LTS program will be clearly defined
- Cleanup decisions will include careful and well-documented consideration of their long-term ramifications (e.g., long-term effectiveness and costs)
- Potential impediments to a safe and timely turnover from cleanup to LTS are anticipated and a risk management approach is developed and implemented.

Figure ES-4. High-Priority Transition Preparation Actions

- Action 1: Establish the interface between the cleanup program and the long-term stewardship program, and identify the necessary transition activities
- Action 2: Provide input to cleanup decisions
- Action 7: Assist in identifying information management requirements
- Action 10: Assist in reducing infrastructure to that minimum necessary to support long-term stewardship needs
- Action 11: Monitor and benchmark national long-term stewardship activities.

Note: Further information regarding these actions is presented in Chapter 3. These 5 actions are listed in the order in which they appear in Chapter 3 and their position is not intended to imply any further ranking among the high-priority actions.

While some portions of the Site may require LTS in perpetuity, LTS for other areas will eventually be considered complete when all remedial action objectives and cleanup goals have been achieved and all required long-term cleanup operations and maintenance activities have been completed (Chapter 4). DOE's LTS activities also may be considered complete when the ownership or administration of the land is transferred to a federal, state, or private entity. If such a transfer occurs, DOE retains liability as the potential responsible party, as required under the *Comprehensive Environmental Response, Compensation and Liability Act of 1980* (CERCLA).[1] DOE will take the requisite steps to ensure controls are in place in accordance with the applicable regulatory requirements and that the controls are transferred using the appropriate mechanism.[2]

[1] *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*, 42 USC 9601, et seq.

[2] Further information regarding the use of controls when land is transferred to another entity is provided in the *Sitewide Institutional Controls Plan For Hanford CERCLA Response Actions* (DOE/RL-2001-41, 2002, U.S. Department of Energy, Richland Operations Office, Richland, Washington).

DOE will continue to identify ways to better prepare for the transition, including evaluating the lessons learned at other DOE sites and from other agencies (e.g., U.S. Department of Defense) that are addressing, or have addressed, similar issues. This document is considered to be a "living document," one that will continue to be reviewed, evaluated, and updated, as appropriate. DOE is committed to maintaining the protection of human health and the environment and to meeting its long-term, post-cleanup obligations.

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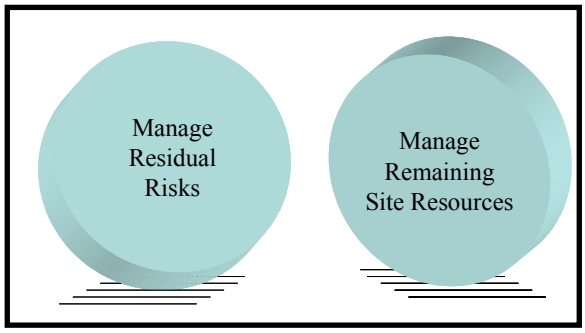
TERMS

AEA	*Atomic Energy Act of 1954*
ALE	Fitzner-Eberhardt Arid Lands Ecology Reserve
CCP	comprehensive conservation plan
CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
CFR	*Code of Federal Regulations*
CLUP	*Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement*
DOE	U.S. Department of Energy
Ecology	Washington State Department of Ecology
EIS	environmental impact statement
EM	U.S. Department of Energy, Office of Environmental Management
EPA	U.S. Environmental Protection Agency
FFTF	Fast Flux Test Facility
LTS	long-term stewardship
National Monument	Hanford Reach National Monument
NARA	U.S. National Archive Records Administration
NCP	"National Oil and Hazardous Substances Pollution Contingency Plan"
NPL	National Priorities List
NRC	U.S. Nuclear Regulatory Commission
PMP	*Performance Management Plan for the Accelerated Cleanup of the Hanford Site*
RCRA	*Resource Conservation and Recovery Act of 1976*
RIMS	Richland Integrated Management System
RL	U.S. Department of Energy, Richland Operations Office
ROD	Record of Decision
SMB	Site Management Board
TBD	To be determined
Tri-Party Agreement	*Hanford Federal Facility Agreement and Consent Order*
USC	*United States Code*
USF&WS	U.S. Fish and Wildlife Service
WBS	work breakdown structure

1.0 INTRODUCTION

Figure 1-1. The Elements of Long-Term Stewardship.



Long-term stewardship (LTS) at the Hanford Site begins at the completion of the U.S. Department of Energy (DOE), Office of Environmental Management (EM) cleanup mission and is the management of the risks (human health and environmental) associated with any residual contamination and the management of the Site's cultural, biological, and natural resources that remain after the Site is reduced to its post-cleanup-mission size (see Figure 1-1). This document describes the anticipated post-cleanup LTS program, the preparations planned to facilitate the safe and timely transition from the completion of the cleanup program to a future LTS program, and when LTS is complete. Although the completion of cleanup remains several decades away, actions are being taken now to ensure the following:

- DOE's commitment to meet its long-term, post-cleanup obligations is reaffirmed and that its planning efforts to comply with those obligations are visible
- The interface between the cleanup program and the LTS program will be clearly defined
- Cleanup decisions will include careful and well-documented consideration of their long-term ramifications (e.g., long-term effectiveness and costs)
- Potential impediments to a safe and timely turnover from cleanup to LTS are anticipated and a risk management approach is developed and implemented.

Definition of Long-Term Stewardship

The first element of LTS protects human health and the environment from the risks associated with residual contamination after the completion of the cleanup mission. The risks and costs involved in the remediation of some sites, along with technical and logistical problems, may make it impracticable to remediate all of them to a condition that would allow unrestricted use. In addition, some waste produced by past nuclear weapons production activities will be disposed of in onsite permitted disposal cells. Therefore, DOE must prepare for managing the risks associated with the residual contamination. Also, long-term treatment and monitoring of groundwater may be required.

"No trespassing" and warning signs

The second element includes consideration of the unique biological, natural, and cultural resources for the land that remains after the Site is reduced to its post-cleanup-mission size. These resources may include the following:

- Fish, wildlife, and plant populations and their habitats
- Prehistoric archaeological sites
- Native American sacred and ceremonial places
- Minerals, natural gas, surface water, groundwater, land, and other natural resources
- Historical resources.

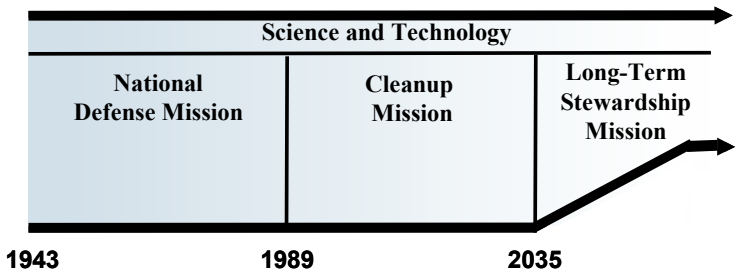
The Columbia River's Hanford Reach

Successful and effective LTS will provide protection and make these resources available through integrated management to enable future generations to benefit from the resources of the reduced-size Site. DOE anticipates multiple future uses for the Hanford Site, including other DOE missions, non-DOE federal missions, and other public and private sector uses.

When Does Long-Term Stewardship Begin?

The EM cleanup mission at the Hanford Site is expected to be completed by 2035 or earlier. At that time, the mission of the Site will transition to LTS (see Figure 1-2). However, for some individual parcels of land, cleanup has been completed or will be completed before 2035. For those parcels of land not cleaned up to allow unrestricted use, it is expected that the cleanup program will conduct any necessary post-cleanup activities, such as the inspection and maintenance of groundwater monitoring wells and engineered barriers, the surveillance of institutional controls, and the performance of required monitoring activities and periodic reviews.[3]

Figure 1-2. Long-Term Stewardship Begins at the Completion of Cleanup.



[3] The *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* requires 5-year reviews to be conducted for sites where hazardous substances, pollutants, or contaminants remain on Site above levels that allow for unlimited use and unrestricted exposure to determine if the remedy is functioning as intended by the cleanup decision documents.

EM cleanup is considered complete when all required long-term response measures (e.g., groundwater treatment systems) are constructed and determined to be operational and functional, all required response activities at a specific site that are not long-term response measures have met their remedial action objectives (e.g., soil excavation, cap construction, building decommissioning), all necessary documentation is in place (e.g., engineering certifications and verifications, post-closure or operating permits, final site condition and configuration records), and excess land areas are administratively transferred from EM responsibility to another DOE, federal, state, or private entity. DOE will maintain liability for any residual waste left on Site unless, as part of a transfer agreement, the receiver has agreed to assume future liability. [4]

1.1 BACKGROUND ON THE HANFORD SITE AND ITS CLEANUP END STATE

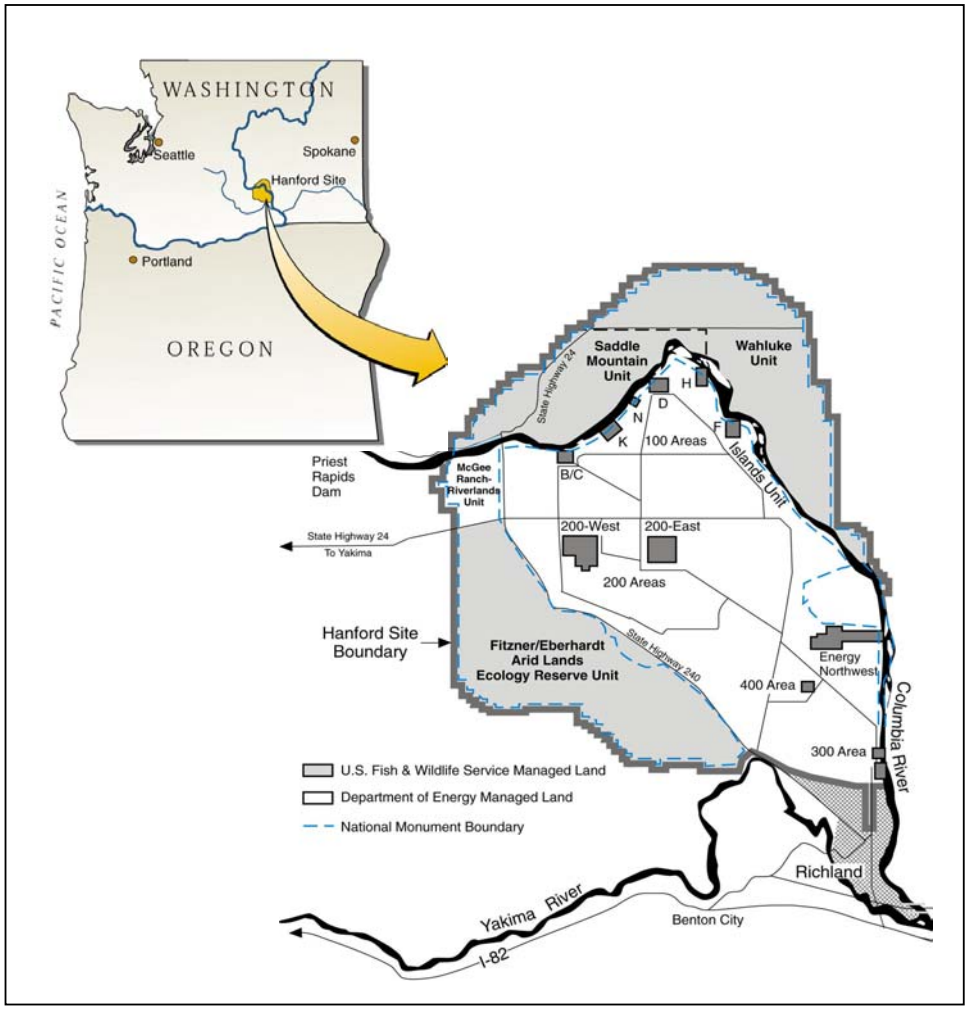
The Hanford Site in southeastern Washington State is approximately 1,517 km^2 (586 mi^2) of semiarid shrub and grasslands located just north of the confluence of the Snake and Yakima Rivers with the Columbia River (see Figure 1-3).

In 1989, portions of the Site were placed on the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) National Priorities List (NPL) as contaminated sites requiring cleanup action. In anticipation of the NPL listing, the U.S. Department of Energy, Richland Operations Office (RL) entered into the *Hanford Federal Facility Agreement and Consent Order* (89-10) (Tri-Party Agreement), with the U.S. Environmental Protection Agency (EPA) and the Washington State Department of Ecology (Ecology). The Tri-Party Agreement established the legal framework and schedule for cleanup.

Top priorities of the EM program include a reduction in risk and a reduction in the time required to complete the EM cleanup mission, as well as a reduction in the amount of land managed actively by EM. Since 1989, portions of the Site have already been cleaned up, removed from the NPL and released for other uses. DOE's strategic initiatives to accelerate cleanup, reduce risk and put the Hanford Site on a path to complete cleanup by the year 2035, are described in the *Performance Management Plan for the Accelerated Cleanup of the Hanford Site (PMP)* (DOE/RL-2002-47).

[4] *Definition of EM Completion and DOE Site Closure* (Fact Sheet), DOE Office of Environmental Management Corporate Projects Initiative, National FOCUS Project, January 2003.

Figure 1-3. Location of the Hanford Site.



The Hanford Site, formerly known as the Hanford Engineer Works, was established by the Federal government in 1943 and, until 1989, was dedicated primarily to the production of plutonium for national defense and the management of the resulting waste. With the shutdown of the production facilities in the 1970's and 1980's, DOE ended the production of nuclear materials for weapons at the Site.

At the conclusion of the cleanup program, some contaminants will remain (e.g., highly dangerous chemicals and radionuclides), both on the surface and subsurface. For example, some radionuclides with half-lives ranging from a few years to millions, if not billions of years, will remain (see Figure 1-4). To address the residual contamination on Site, including disposal facilities, the cleanup remedies will include engineered barriers and institutional controls, including restrictions on the use of groundwater and access to land (e.g., Central Plateau area), and groundwater monitoring activities.

The current assumptions for the end state of the Site following the completion of cleanup, based on the cleanup milestones in the Tri-Party Agreement, Records of Decision (ROD), and the Hanford Site baseline, and as described in the PMP (completion of the EM mission), are summarized in Table 1-1. Table 1-1 summarizes the assumptions for the end state in terms of ongoing operations, ongoing controls, and the types of uses for which the land will be available (e.g., industrial). Appendix A provides an excerpt from the PMP that presents further details regarding the potential end state.

Figure 1-4. Radionuclide Half-Lives.

Radionuclide	Half-Life[a]	Radionuclide	Half-Life[a]
cesium-137	30 years	strontium-90	29 years
iodine-129	15,700,000 years	technetium-99	212,000 years
plutonium-238	88 years	tritium	12 years
plutonium-239	24,100 years	uranium-238	4,470,000,000 years

[a] Half-life is the time it takes for one-half of any given number of unstable atoms to decay.
Source: U.S. Environmental Protection Agency (http://www.epa.gov/radiation/radionuclides/index.html)

Table 1-1. Summary of Post-Cleanup Completion End State.

Area	Operations	Controls	Availability for Non-DOE Uses
River Corridor	Several facilities in the 300 Area will still be operating to service the Pacific Northwest National Laboratory. The first of Hanford's reactors could be a museum and the remaining eight will be "cocooned" for safe storage until a final decision on their disposal is made. The federal government will continue to protect cultural resources and carry out its trust responsibilities.	There will be continued engineering and institutional controls on the use of groundwater and on excavation.	The 100 Area land surface will be cleaned to a level suitable for residential use (to a depth of approximately 4.6 m [15 ft]), and the 300 Area cleaned to a level suitable for industrial use. Some land is included in the Hanford Reach National Monument. Groundwater is not allowable for use.
Central Plateau	Commercial waste operations (U.S. Ecology's disposal site is leased through the year 2064), the U.S. Navy's disposal of decommissioned naval reactor compartments, stewardship, and perhaps ongoing DOE waste disposal operations. Also continuation of ongoing groundwater monitoring. There will be a federal responsibility at Hanford for generations to come, but DOE's EM cleanup work would be complete.	There will be engineering and institutional controls in place and continuation of ongoing groundwater monitoring.	The Central Plateau's Core Zone (the 200 Areas including B Pond and S Ponds) will have an "industrial use scenario" for the foreseeable future. Waste sites outside the Core Zone but within the Central Plateau (200 N, Gable Mountain Pond, B/C Crib Controlled Area) will be remediated and closed based on an evaluation of multiple land use scenarios to optimize use, control costs, and risk management.

Source: The information presented in this table is a summary compilation of the potential end state described in DOE/RL-2002-47, *Performance Management Plan for the Accelerated Cleanup of the Hanford Site (PMP)*, Revision D, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

Appendix A provides an excerpt from the PMP that presents further details regarding the potential end state.

Portions of land will be transferred out of DOE control as they become excess to the DOE mission. Approximately 790 km^2 (305 mi^2) of the Site have been set aside as the Hanford Reach National Monument (National Monument) and portions will be considered for transfer to the U.S. Fish and Wildlife Service (USF&WS) as early as 2004. The National Monument includes most of the Saddle Mountain National Wildlife Refuge, the North (Wahluke) Slope, the Fitzner-Eberhardt Arid Lands Ecology Reserve, some of the Columbia River Corridor, and the former McGee Ranch and Riverland areas.

1.2 WHY IS PREPARING FOR LONG-TERM STEWARDSHIP IMPORTANT TODAY?

It is important for DOE to define a program at this time so that it can then prepare to meet the post-cleanup obligations for land that will be under DOE management following the completion of the cleanup mission. The program must be planned sufficiently in advance to ensure that it will be in place at the time of turnover, ready to meet DOE's post-cleanup obligations in a safe, compliant, and cost-effective manner.

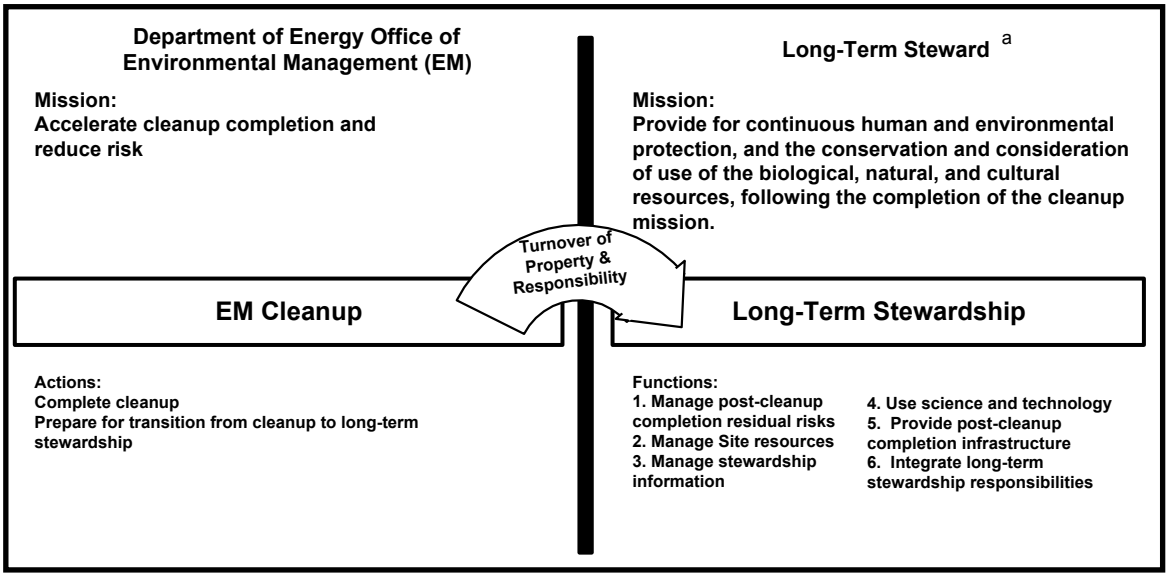
This is a pivotal time regarding the long-term care of the Hanford Site because there are activities occurring today that have an impact on the scope of LTS and vulnerabilities could potentially be created for the LTS transition if preparations are not begun prior to the completion of the cleanup mission. For example, fundamental decisions regarding cleanup are being made today that will define the future landscape of the Site, including the extent of land that will be excess to the DOE mission, as well as the types, locations, and amounts of residual contamination. Because of the long-term ramifications of the cleanup decisions being made today, as well as the relatively short timeframe in which the accelerated cleanup will be completed for some portions of the Site, DOE must carefully consider LTS requirements during the current cleanup decision-making process.

To prepare for the transition, some near-term activities (see Chapter 3) must begin now. Some of the near-term activities identified are needed to directly support the use of risk-based end states that the department is currently implementing. Another of the near-term activities is to clearly define the completion of the cleanup program, along with the establishment of draft turnover criteria for land that is transitioned from the cleanup program to the LTS program. The criteria are crucial to enabling the accelerated cleanup completion. Establishing turnover criteria in the near-term will enable the early identification and subsequent avoidance of potential impediments to safe and timely transition. Another near-term activity involves ensuring that credible life-cycle costs for the post-closure obligations are identified. Long-term costs are not only one of the CERCLA evaluation criteria, but they also are one of the key considerations in the development of the end state vision. Another near-term activity is the benchmarking of post-closure programs at other federal agencies to identify the lessons learned and to consider them in the development of the Hanford LTS program. A DOE project plan will be developed for actions in the near term (up to 5 years in the future) to describe the functions, roles, responsibilities, and schedule for the transition period. These actions will help to ensure a seamless transition from the cleanup mission to the LTS program.

1.3 PURPOSE AND CONTENT OF THE HANFORD LONG-TERM STEWARDSHIP PROGRAM AND TRANSITION DOCUMENT

The *Hanford Long-Term Stewardship Program and Transition: Preparing for Environmental Management Cleanup Completion* (Hanford Long-Term Stewardship Program and Transition) document presents a description of the future LTS program and describes the scope of the preparation activities that are planned to support the transition from cleanup completion to LTS (see Figure 1-5). This document also describes when LTS is complete. This document is to be used as an internal DOE management tool to prepare for the transition. The actions presented in this document do not impose any legal or regulatory obligations.

Figure 1-5. Preparing for the Transition to Long-Term Stewardship.



[a] The long-term steward for DOE-managed land will be a DOE program secretarial office other than the Office of Environmental Management. The long-term steward for land that is excessed from DOE will be the entity receiving the land (federal, state, or private entity). Although the functions shown in the figure are the functions anticipated for DOE's long-term stewardship program, a non-DOE long-term steward may perform similar functions. As a result, the planned transition activities described in this document will be applicable to land undergoing cleanup, whether the land will ultimately be managed by DOE or by another entity.

The Hanford Site has taken a holistic, multi-generational, and integrated approach to establish the vision, mission, goals, and functions that will serve as the foundation for the post-cleanup LTS program. The definition of the program incorporates input provided by regulatory agencies, Tribal Nations, Hanford Advisory Board workshops, and the products of other national stakeholder workshops on this subject, as well as comments received from the public on the working draft of this document. This is a "living" document that may be updated on a periodic basis to reflect the evolving issues related to the transition. The following is a description of the remaining chapters of this document, along with the appendix.

Chapter 2 presents the anticipated vision, mission, goals, and functions for the post-cleanup LTS program. The program will be implemented for land where DOE is responsible for its management following the completion of the cleanup mission. This document is not intended to describe a program for non-DOE entities that may manage or control previously DOE-managed land.

Chapter 3 describes the near-term actions to prepare DOE for the transition. The actions presented in this chapter also help to address concerns raised by local and national stakeholders regarding LTS, including the consideration of LTS values in cleanup decisions, and other similar concerns. DOE recognizes that the actions described in this chapter may not include all of the actions needed to ensure a smooth transition. DOE will continue to identify ways to better prepare for the transition, including evaluating the lessons learned at other DOE sites that are, or soon will be, conducting LTS, as well as sites that are actively engaged in preparing for the transition process. DOE also will consider lessons learned from other agencies that may be addressing similar issues, such as the U.S. Department of Defense, which at times must clean up and close some of its installations.

Chapter 4 defines when LTS will be considered complete. This chapter briefly describes DOE exit strategies for land that no longer requires LTS activities to be conducted by DOE. Due to the nature of some of the residual contamination, portions of the Hanford Site may require LTS in perpetuity.

Appendix A presents an excerpt from the PMP that describes the current assumptions for the end state of the Site following the completion of cleanup.

2.0 LONG-TERM STEWARDSHIP PROGRAM

DOE is committed to maintaining the protection of human health and the environment and to meeting its long-term, post-cleanup obligations in a safe and cost-effective manner. This chapter describes the future program at the Hanford Site dedicated to LTS, including its vision, mission, goals, and the anticipated key functions. The LTS program will be managed by a DOE program secretarial office, other than EM, that is to be identified in the future. For land that is no longer managed by DOE, the long-term steward will be the entity to which the land was transferred (federal, state, or private entity). Although the functions described in this chapter may be similar to the functions that would be performed by a non-DOE entity, this chapter does not describe a program for those entities. However, DOE will ensure an adequate turnover to a non-DOE entity that takes responsibility for land that involves residually contaminated areas.

The framework for the LTS program was developed through a series of workshops designed to provide an opportunity for the Tribal Nations, stakeholders, and others to influence the development of the program, as well as comments received from the public regarding the draft document, *Hanford Long-Term Stewardship Program: Integrating Accelerated Site Cleanup Completion with Long-Range Post-Cleanup Planning* (HNF-12254, Working Draft, Revision A). The workshops solicited input regarding the participants' ideas and understanding of what LTS is, their future vision of the Site once cleanup is completed, and their values for LTS planning. The public comment period for the *Hanford Long-Term Stewardship Program* was held October 21 through December 9, 2002, to receive early public input in the planning process from the affected communities.

2.1 LONG-TERM STEWARDSHIP VISION, MISSION, AND GOALS

Beginning with the end in mind, the LTS program will be built on an ideal, as represented by its vision statement. The vision statement is a simple description of what the program is working toward, an inspirational picture, based on national and local values, of the desired state of the system that will be influenced by the LTS program. The LTS vision for the Hanford Site is

> *The vitality of human, biological, natural, and cultural resources is sustained over multiple generations*.

The Site functions needed to achieve the LTS vision will be the central elements of the LTS program. The LTS program's purpose and functions are defined in the LTS program mission statement, which serves as the charter, or direction, for the program. The mission statement describes those who are served by the program and what is desired to be achieved in the long-term:

> *The mission of the long-term stewardship program is to provide for continuous human and environmental protection, and the conservation and consideration of use of the biological, natural, and cultural resources, following the completion of the cleanup mission. This will be accomplished through the following functions:*

1. *Managing post-cleanup completion residual risks*
2. *Managing Site resources*
3. *Managing stewardship information*
4. *Using science and technology*
5. *Providing post-cleanup completion infrastructure*
6. *Integrating long-term stewardship responsibilities.*

Each of the six LTS program functions has an associated goal, as follows:

1. ***The interactive system of human cultures, ecology, and natural resources are protected from the risks associated with the residual contamination.***

Groundwater monitoring well along river

The intention of this goal is to ensure the effective management of the controls and systems that are designed to work in conjunction with the remedy to provide protection from the residual contamination. The requirements of managing residual risk shall be included in the protection and use of Site resources when making LTS decisions. The LTS environmental monitoring programs will be integrated, ensure protection, and provide advance warning of potential adverse soil or groundwater impacts. The results of this goal is that future generations, human and otherwise, are protected from residual contamination, and potentially affected parties have confidence in the effectiveness of the controls.

2. ***Reuse and/or access to resources are provided such that their conservation and protection is compatible with their use.***

Hanford High School (Historical Building)

The intention of this goal is to integrate the management of the biological, natural, and cultural resources of the Hanford Site under DOE administration in a manner that continues their conservation into the future. DOE will provide access to current and future generations to the Hanford heritage for their use, inspiration, and enjoyment. The access will be accorded such that important cultural resources will be protected and the habitat critical to the survival of vulnerable plant and animal species will be sustained on DOE-managed lands and waters. Site resources will be protected and preserved as an integral part of a healthy regional ecosystem. The land and other resources of the Site's future "footprint" will be used or reused in a manner that honors and considers the sometimes competing values of external parties. DOE will coordinate with the USF&WS as they manage the resources under their control on the Site. Land use decisions shall be made based on the Comprehensive Land-Use Plan (CLUP) ROD. The requirements for managing residual contamination will be considered in the protection and use of

Site resources when making LTS decisions. The result of this goal is that the Site resources remaining under DOE administration will be preserved with beneficial use encouraged.

3. ***Reliable and accurate stewardship knowledge is provided to governments and affected parties.***

Well drilling in potentially contaminated area

The intention of this goal is to enable understanding of the responsibilities and risks associated with LTS for as long as it is necessary to support the protection of human health and the environment from the residual contamination. Information regarding residual risks and resource management shall be preserved and made available to affected parties, including entities that own, manage, or use the land, as well as the communities surrounding the Site. As stewardship issues occur, decision-makers will have adequate information to make prudent decisions or to provide advice. DOE will establish the systems to ensure that the required information is accessible and understandable. The result of this goal is that long-term future use decisions are protective.

4. ***Science is used to understand, predict, and reduce the risks of the long-term interaction of humans, animals, and the environment with residual contamination, while improving the efficiency of the LTS program.***

Example of Closed Disposal Cell Surveying Activities
(photo provided by another DOE site)

The intention of this goal is to remain aware of the latest products of research and development regarding the scientific knowledge and technologies that could be applied at the Hanford Site to improve the efficiency and effectiveness of LTS. Working with its Tri-Party signatories, DOE will seek to apply better stewardship solutions when the long-term benefit warrants post-cleanup completion expenditures. The LTS activities will be designed with the flexibility to incorporate new information that may become available in the future (e.g., cleanup monitoring, new technology). The potential results of this goal are lower life-cycle costs, increased accessibility to resources, longer term design lives for disposal and monitoring solutions, and reliable preservation of stewardship information.

5. ***Infrastructure is provided for stewardship and ongoing DOE missions that is cost-effective and efficient.***

Road Maintenance

The intention of this goal is for DOE to maintain and supply the minimum infrastructure required to support the activities of LTS for DOE-managed land. The LTS program will help in the strategic planning process for ensuring the necessary and sufficient infrastructure is available to support LTS. The result of this goal is that the infrastructure remaining after the completion of the cleanup mission will be cost-effective and meet the needs of LTS and ongoing missions.

6. ***The LTS program is designed and operated to achieve an integrated, holistic, and multi-generational approach.***

The LTS program will be designed to integrate its functions to achieve operational consistency in quality across the Site. To ensure a long-term and holistic perspective, a part of this goal will be to conduct Tribal consultation, and have involvement with stakeholders and affected parties. The results of this goal are well-defined contracting specifications, effective external advisory processes, direct application of other Sites' experiences, a more proactive interface with cleanup decisions, and a smooth transition from the EM cleanup mission to the LTS program. For this goal to be achieved effectively, actions prior to the commencement of the LTS program are necessary to support the transition of the Site from the cleanup mission, with EM as the Site manager, to its post-cleanup Site manager.

2.2 POST-CLEANUP LONG-TERM STEWARDSHIP FUNCTIONS

The mission of the LTS program will be accomplished through the implementation strategies of the six LTS functions, as described in the following sections. Figure 2-1 illustrates the purpose and benefits of the implementation strategies—to achieve the LTS goals (summarized and labeled as "Results" in the figure), using the foundation upon which LTS will begin ("Starting Conditions"), while considering the key items that define the overall framework for LTS ("Controls and Constraints") and the assets that are available to perform the strategies ("Resources and Mechanisms"). The LTS program functions ("Value Added") are the centerpiece of DOE's strategy for achieving the LTS mission. A diagram similar to Figure 2-1 is presented at the conclusion of each of the following sections to illustrate the purpose and benefits of each LTS function. Information regarding the actions that will be taken in the near term for each function, in preparation for the transition from cleanup to LTS, is provided in Chapter 3.

2.2.1 Manage Post-Cleanup Completion Residual Risks

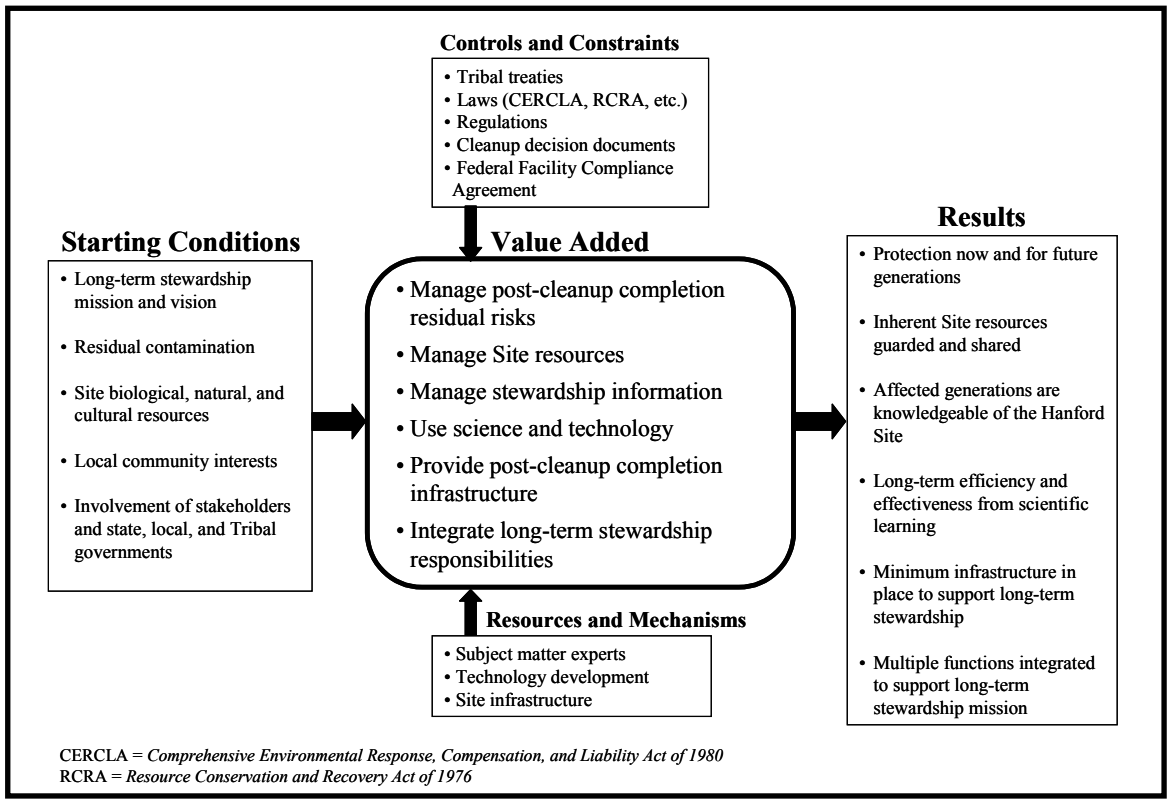
GOAL 1: The interactive system of human cultures, ecology, and natural resources are protected from the risks associated with residual contamination.

The following sections present background information regarding the management of post-cleanup completion residual risks, describe the scope of this function to meet its goal (see Goal 1), and summarize the function's benefits.

2.2.1.1 Background

At the completion of the cleanup mission, the DOE-managed portions of the Hanford Site will be turned over to the post-cleanup Site manager, who will ensure DOE meets its post-cleanup obligations. The specific end states resulting from cleanup, which will be the starting conditions for the future LTS program, are not fully known at this time; however, we do know that the portions of the Site that are transitioned may have associated controls to manage the risks associated with the residual contamination.

Figure 2-1. Value Added by the Long-Term Stewardship Program Functions.



DOE uses a layering strategy of mutually reinforcing controls that works in conjunction with the remedy to protect human health and the environment from the risks associated with the residual contamination (see Figure 2-2).

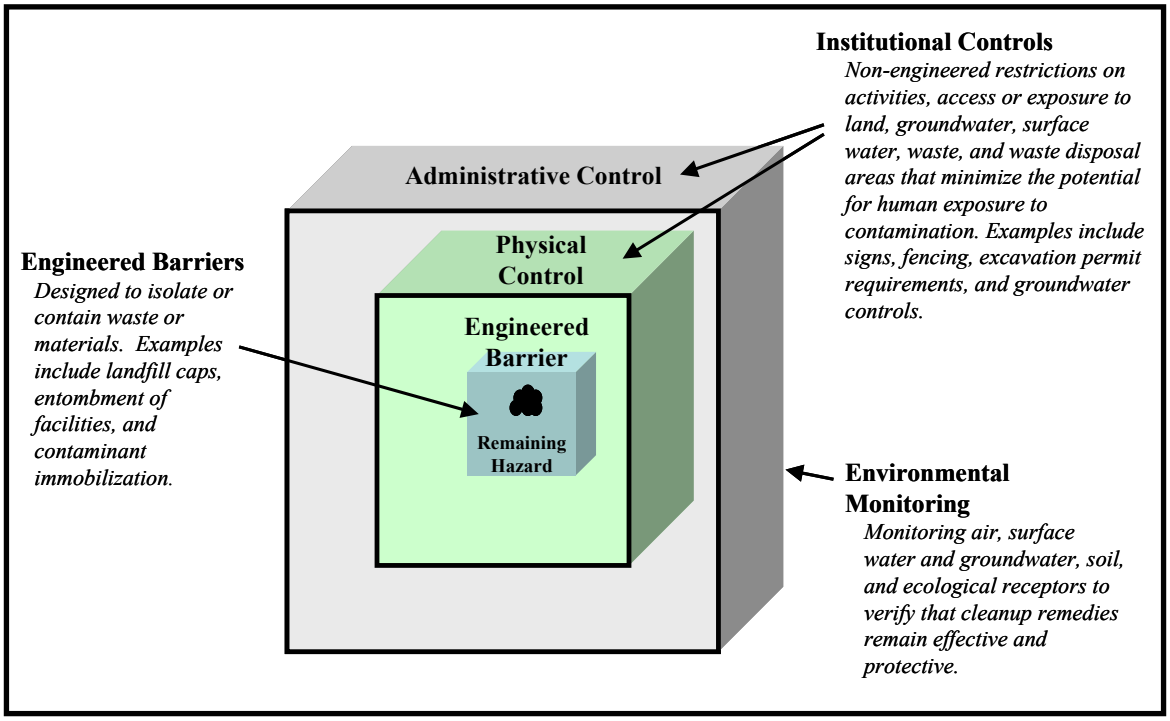
- Engineered barriers are controls designed to isolate or to contain waste or materials (e.g., caps, entombment of facilities, contaminant immobilization).

- Physical controls provide an additional level of protection when used in conjunction with an engineered barrier to discourage people from reaching the residual contamination. Physical controls may include, but are not limited to, signs, warning markers, and fences.

- Administrative controls are the administrative set of policies, procedures, and laws that help ensure that activities or uses do not disturb physical controls, engineered barriers, or the residual contamination. Physical and administrative controls are commonly referred to collectively as "institutional controls."

- Environmental monitoring includes the monitoring of air, surface water, groundwater, soil, and ecological receptors to verify that cleanup remedies remain effective and protective.

Figure 2-2. Institutional Controls Work in Conjunction with Engineered Barriers.



Institutional controls (administrative and physical controls) generally include non-engineered restrictions on activities, access or exposure to land, groundwater, surface water, waste, and waste disposal areas that minimize the potential for human exposure to the residual contamination. Institutional controls include warning notices, entry restrictions, land-use management, groundwater use management, and waste site information management. Institutional controls are used in conjunction with the remedy during and after cleanup (if contamination remains) and are designed to protect the integrity of the engineered barriers. In some cases, the residual risk is minimal and institutional controls are the only level of protection required once the remediation is complete.

The requirements for engineered barriers and institutional controls are found in the cleanup decision documents for the Hanford Site. Cleanup decision documents (e.g., CERCLA RODs, RCRA permits) stipulate the selected remedy, which may include the implementation of engineered barriers and institutional controls. Generally, the CERCLA remedy evaluation process begins with the expectation that treatment or engineering controls will be used to address principal-threat waste. Unless active response measures are determined to be impracticable, the "National Oil and Hazardous Substances Pollution Contingency Plan" (NCP)[5] cautions against the use of institutional controls as the sole remedy. However, the NCP emphasizes that institutional controls may supplement engineered controls and may be a necessary component of the completed remedy.

[5] 40 CFR 300, 1998, "National Oil and Hazardous Substances Pollution Contingency Plan (NCP)," Title 40, *Code of Federal Regulations*, Part 300, as amended.

The current requirements for institutional controls are listed in DOE/RL-2001-41, *Sitewide Institutional Controls Plan For Hanford CERCLA Response Actions* (Hanford Sitewide Institutional Controls Plan), along with a description of their implementation and maintenance. Future updates of the *Hanford Sitewide Institutional Controls Plan* will reflect any changes in the institutional control requirements as new CERCLA decision documents are issued. Other regulations, in particular the *Resource Conservation and Recovery Act of 1976* (RCRA) and U.S. Nuclear Regulatory Commission (NRC) regulations, also consider the use of institutional controls as a supplement to the use of engineered barriers as appropriate for short- and long-term management to prevent or limit exposure to residual contamination.[6] For the near term, these non-CERCLA institutional control activities are or will be planned and implemented through their own regulatory mechanisms, such as the Hanford Sitewide RCRA permit.

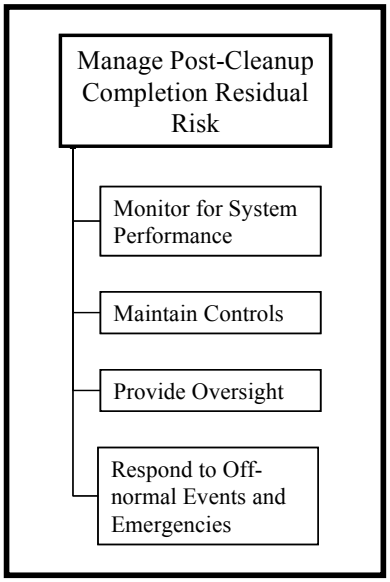
Example of a Disposal "Cap"
(photo provided by another DOE site)

2.2.1.2 Definition and Scope of the Function "Manage Residual Risk"

The LTS program will conduct the following activities to manage post-cleanup residual risks and comply with the regulatory requirements specified in the cleanup decision documents (see Figure 2-3):

- Monitor the performance of the remedies, including engineered barriers and institutional controls, and operate groundwater pump-and-treat system in accordance with the requirements stipulated in the cleanup decision documents
- Maintain the systems in working condition and conduct regular inspections
- Provide oversight management of the systems
- Respond to unexpected, or off-normal, conditions and emergency situations.

Figure 2-3. Key Elements of the Post-Cleanup Completion Residual Risk Work Breakdown Structure.



Monitor for System Performance

The LTS program will conduct monitoring, as prescribed by the remedies in the cleanup decision documents, to verify that the remedies remain effective and that contaminant migration is prevented. For remedies such as natural attenuation, monitoring will be conducted to ensure any contaminant migration occurs within the applicable regulatory limits (see Figure 2-4).

[6]CERCLA: 40 CFR 300.430 (a)(1)(iii)(D)6; RCRA: 61 FR 19448 (May 1, 1996); NRC: 10 CFR 20.1402.

The LTS program will monitor the air for atmospheric releases in accordance with the statutory requirements. The air may be monitored by a network of sampling locations on and around the Hanford Site, including any points of release into the environment, and the samples will be analyzed for their content.

Figure 2-4. The Long-Term Stewardship Program Will Monitor the Media as Required.

- Air
- Ecological receptors (fish, wildlife, vegetation)
- Soil
- Water (surface and groundwater)

The monitoring of ecological receptors will include the monitoring of fish, wildlife, and vegetation as prescribed by the remedies in the cleanup decision documents or if required by federal and state requirements. Wildlife may inadvertently access areas of the Site containing radioactive or chemical contamination (e.g., burrowing in waste burial grounds) or be exposed to materials moving out of contaminated areas (e.g., through blowing dust or food-chain transport). Aquatic organisms (e.g., fish, bivalves) may be exposed to contamination entering the river along the shoreline. Fish and wildlife may be sampled to document levels of contamination in the edible tissues. Vegetation sampled may include farm produce, alfalfa, and other crops, as well as plants that may be growing in contaminated areas. Further details regarding the LTS program's strategy for managing Site biological resources are provided in Section 2.2.2.

Soil will be monitored as prescribed by the remedies in the cleanup decision documents or if required by federal and state requirements and regulations for releases and potential transport of radioactive material and hazardous contaminants. Soil samples may be collected, analyzed, and evaluated to determine the possible atmospheric deposition of radioactive material or hazardous contaminants.

Groundwater and surface water will be monitored as required by the remedies in the cleanup decision documents or if required by the *Clean Water Act of 1977* or other federal and state requirements and regulations for releases and potential transport of radioactive material and hazardous contaminants. Groundwater may be monitored by a network of wells on and around the Hanford Site to assess the presence, distribution, and movement of contamination. Groundwater monitoring also may include monitoring for remedies that use natural attenuation. Samples of surface water and sediment on and near the Hanford Site may be collected and analyzed to determine the presence and potential transport of radioactive material and hazardous contaminants. Surface water bodies may include the Columbia River and associated riverbank springs, onsite ponds, and irrigation sources.

The selected long-term response action for some portions of the Site may include the operation of a groundwater pump-and-treat system. Pump-and-treat systems generally include any system where there is a withdrawal from or an injection into groundwater (e.g., one type of pump-and-treat system pumps contaminated groundwater to the surface for treatment to reduce contaminant concentrations to cleanup standards, and then injects the water back into the groundwater). For land that is transferred to the LTS program prior to the completion of maintenance and operation for a pump-and-treat system, the LTS program may assume responsibility for the operation and

maintenance of the system until the remediation action objectives and remediation goals are achieved, based on the applicable regulatory requirements.

The LTS program also will evaluate the results of monitoring to determine when the desired performance of an environmental restoration project has been achieved, the remedial objective has been met, and its associated activities (e.g., access restrictions) can be terminated. DOE will work with the appropriate regulatory agencies and follow the appropriate regulatory process to terminate the control and complete any remaining subsequent regulatory actions (e.g., NPL deletion, closure of a RCRA permit).

The LTS program will provide oversight of the monitoring activities. Oversight activities include an assessment of the analytical methods and quality control assurances against the Tri-Party Agreement and applicable regulatory requirements. This oversight also will include the review and evaluation of the monitoring results, as well as inspection and maintenance activities, to verify the protectiveness of the remedies. The inspection and maintenance activities are described in the next section; information regarding the evaluation of the effectiveness of engineered barriers and institutional controls, as well as other oversight activities, is provided in the following sections.

Maintain Engineered Barriers, Physical Controls, and Any Remaining Long-Term Response Actions

The LTS program will conduct maintenance of the engineered barriers, physical controls, and any remaining long-term response actions to prevent and identify potential problems at an early stage, prior to the need for significant repairs and before the protectiveness of the remedies may be compromised (see Figure 2-5). Well-planned and well-executed maintenance activities will help to extend the effective design life of the controls and ensure the long-term protection of human health and the environment. Maintenance activities will include the following:

Figure 2-5. Purpose of Maintenance Activities.

- Keep controls in working order
- Prevent potential problems
- Ensure protectiveness of remedies.

Example of a Cap Inspection
(photo provided by another DOE site)

- Routine maintenance activities will keep the engineered systems, physical controls, and long-term response actions in working and effective condition and conduct nominal repairs and planned component replacements.

- Physical inspections of the engineered barriers (e.g., identify if there are changes to the slope configuration of caps) and physical controls (e.g., identify if warning signs' supports are inadequate) will be used to determine the need for major overhauls and/or significant design alterations. When nonconformance situations are identified, DOE will perform the necessary corrective actions to the engineered barriers and physical controls.

The LTS program will plan for the maintenance of the controls by considering the following items: the frequencies and types of maintenance, repair, and replacement activities; the frequencies, types, and locations of physical inspections; reporting requirements; and the development of threshold levels for when corrective actions should be initiated. Controls currently are maintained by the cleanup program.

Provide Planned Oversight

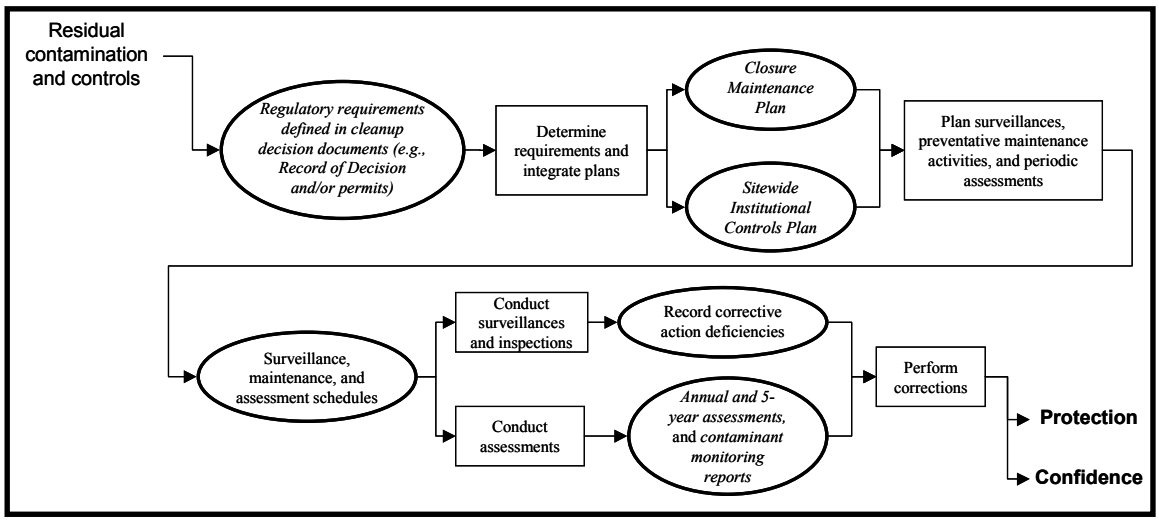
Oversight is the review of the activities that provide protection from residual risks by overseeing the operation and performance of those activities. The purpose of oversight is to verify that the tasks of LTS are performed in a safe, secure, and quality manner that protects the public, the worker, and the environment. Oversight includes conducting surveillances and assessments. The LTS program will determine how well the protective activities work together as a system and what the opportunities are for improvement (see Figure 2-6).

Figure 2-6. The LTS Program Will Ensure the Entire System is Protective.

As an example of oversight, the LTS program will conduct surveillances to verify that institutional controls are being followed (e.g., no unauthorized excavations), to oversee the monitoring and maintenance activities, and to review the preparations for when land is transferred to a non-DOE entity. This includes assessing the analytical and quality assurance methods to ensure these activities are conducted as required by the remedies.

The LTS program will assess whether the controls remain effective in meeting their design and remedial objectives (see Figure 2-7 for a depiction of the steps). The LTS program will track and evaluate the long-term trends observed in the monitoring results and maintenance activities to identify any significant changes that could increase the potential exposure of human health and the environment to the residual contamination and identify any emerging contamination problems that were previously undiscovered. The LTS program also will track and evaluate the gradual changes of additional factors that may affect the continued protectiveness of remedies, including site conditions, regulatory requirements, and land uses for the property at or near the controls (which may include offsite property). Assessment also will include the 5-year review required by CERCLA (see Figure 2-8). If cleanup decisions are required to be revisited, the applicable regulatory process will be followed.

Figure 2-7. Inspection and Oversight.



The LTS program will help to identify how controls will be managed when land is transferred to a non-DOE entity. Once the cleanup objectives have been completed and required cleanup standards achieved for a particular piece of property, DOE may reuse the land or it may become available for transfer to others, either through a change in ownership or management, or through leasing. Further details regarding the transfer of land to non-DOE entities are provided in Chapter 3 (see Action No. 15) and Chapter 4.

Figure 2-8. Questions Asked by CERCLA 5-Year Review.

Five-year reviews are conducted for sites cleaned up under CERCLA when hazardous substances, pollutants, or contaminants remain on site above levels that allow for unlimited use and unrestricted exposure. Five-year reviews seek to answer the following questions:

- Is the remedy functioning as intended by the decision documents?
- Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy still valid?
- Has any other information come to light that could call into question the protectiveness of the remedy?

Source: EPA, *Superfund Comprehensive Five-Year Review Guidance*, Office of Emergency and Remedial Response, EPA 540-R-01-007, OSWER No. 9355.7-03B-P, June 2001.

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980.*

EPA = U.S. Environmental Protection Agency.

If cleanup has not been completed to an unrestricted-use standard, institutional controls as defined in the associated cleanup decision documents, may be required for the transferred land. It is intended that the entities receiving the land will maintain and monitor the institutional controls that DOE has put in place (or their equivalent) or that DOE will retain the right of access to the property to continue that responsibility.

The institutional controls that are required to remain in place will be conveyed using the appropriate mechanism to attach the controls to the property. DOE will involve EPA and the State in discussions to ensure that appropriate provisions are included in the conveyance documents to maintain effective institutional controls. Further information regarding the use of

institutional controls when land is transferred to another entity is provided in the H*anford Sitewide Institutional Controls Plan*.

Respond to Off-Normal Events and Emergencies

Off-normal events occur when a protective system unexpectedly performs outside of the expected range of acceptable performance. Examples of off-normal events include the deterioration of a physical control beyond predicted levels, an error that results in a "near-miss" injury, and the discovery of previously unidentified sources of contamination. DOE's response measures to off-normal events may include modifying processes, such as making adjustments to the type and frequency of monitoring and maintenance activities; modifying existing controls; establishing new controls; and/or initiating cleanup actions. If applicable, DOE will follow the appropriate approved regulatory process for its response measures. Corrective actions initiated as a result of routine maintenance and inspections will be addressed by the maintenance activities. If DOE is the post-cleanup landlord, the existing system designed to address off-normal events will be used.

The LTS program will determine what organizations need to be notified and involved in the decision-making process for designing and implementing response measures (e.g., Tribal Nations, local governments, regulatory agencies). The LTS program will notify the appropriate regulatory agencies if regulatory thresholds are exceeded. Releases of hazardous substances in excess of quantities reportable under CERCLA will be immediately reported to EPA. Spills or discharges of hazardous substances or dangerous wastes to the environment, other than releases permitted under state or federal law, will be immediately reported to EPA and/or the state.

The LTS program will ensure that there is the capability to respond to emergency situations. The LTS program will implement emergency response measures for events such as fires; spills and other chemical or radionuclide releases; natural disasters such as catastrophic storm events, earthquakes, or tornados; operational emergencies (workplace accidents); emergencies that may involve residual contamination on Site (e.g., discovery of new and significant amounts of released contamination); onsite and offsite transportation incidents involving radiological and nonradiological hazardous material (if any post-cleanup shipments are required); security emergencies; and offsite emergencies that have the potential for detrimentally affecting the health of personnel and safety of post-cleanup LTS operations at the Hanford Site. In the event that an engineered barrier or an institutional control is adversely affected during such an emergency, DOE will take the necessary steps to reinstate the control and/or reinforce existing controls with new controls, as appropriate.

If the threshold levels for an emergency response are exceeded during any time, emergency response measures will be implemented immediately. Prior to land being transferred to the LTS program, the LTS program will review the emergency management plan associated with the land to ensure response measures are adequately defined for the types of emergencies that may occur during long-term stewardship. In particular, the LTS program will review the plan to evaluate whether the protection and integrity of the engineered barriers and institutional controls are addressed in the plan.

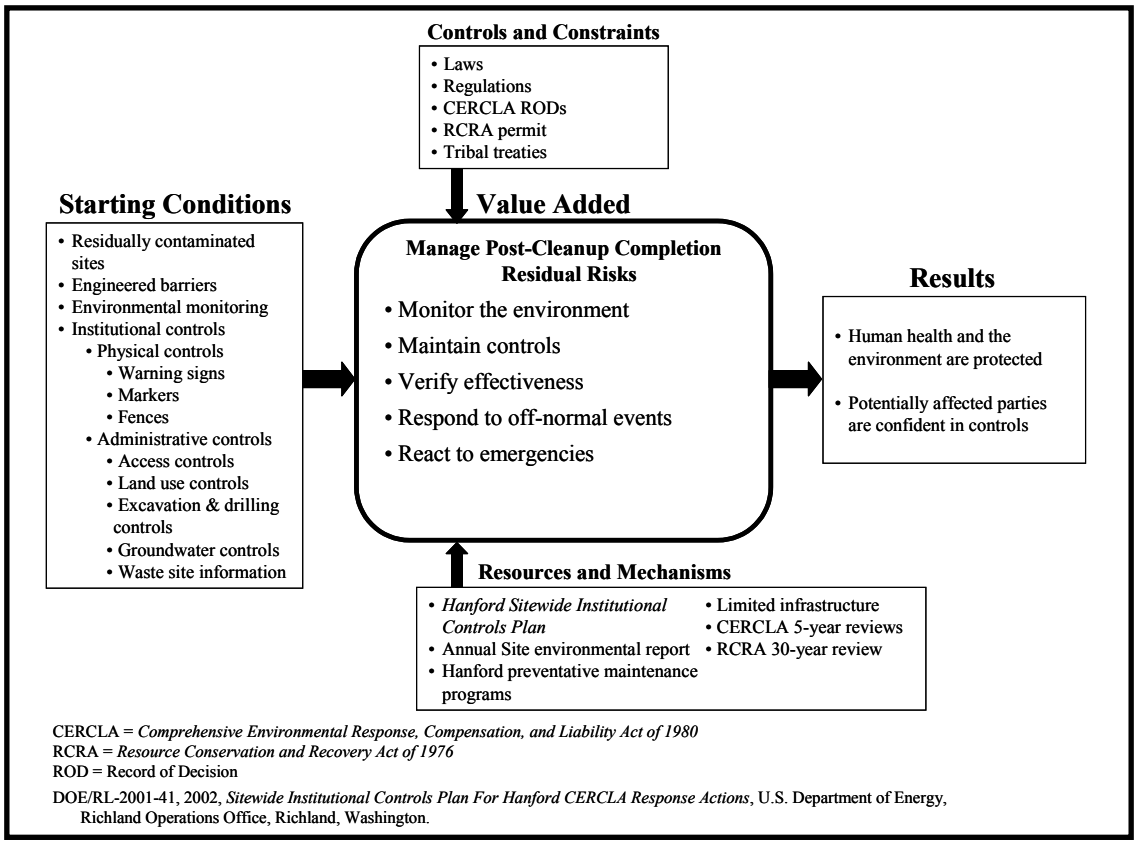
2.2.1.3 Benefits

The LTS program's management of post-cleanup completion residual risks will help to ensure that the controls perform as expected and that human health and the environment are protected (see Figures 2-9 and 2-10).

Figure 2-9. Factors that May Threaten the Performance of Engineered Barriers and Institutional Controls.

- Engineered barriers and physical controls have a finite design life
- Parts or whole systems of engineered barriers and physical controls may need repair or replacement
- Natural conditions and processes may change over time, potentially affecting the performance of controls
- Assumptions made during the remedy selection process (e.g., land use patterns of surrounding areas) may change over time
- Unexpected failures of controls may occur and contaminants and/or waste may no longer be contained
- Humans may choose to inadvertently or intentionally breach controls
- Animals may breach controls (e.g., animals burrowing into caps)
- Plants may breach controls (e.g., deep roots may tap into buried waste)
- Natural disasters and other emergencies may compromise the integrity of the controls.

Figure 2-10. Value Added by Managing Post-Cleanup Completion Residual Risks.



CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
RCRA = *Resource Conservation and Recovery Act of 1976*
ROD = Record of Decision

DOE/RL-2001-41, 2002, *Sitewide Institutional Controls Plan For Hanford CERCLA Response Actions*, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

2.2.2 Manage Site Resources

The following sections present background information regarding the management of Site resources, describe the scope of this function to meet its goal (see Goal 2), and summarize the function's benefits.

GOAL 2: Reuse and/or access to resources is provided such that their conservation and protection is compatible with their use.

2.2.2.1 Background

The Hanford Site includes significant resources that have been set aside and protected for nearly 60 years, including the last free-flowing stretch of the Columbia River in the United States; habitat for numerous endangered, protected, and listed species; and significant historical and cultural sites (see Figure 2-11). The production of defense nuclear materials at the Hanford Site since 1943 has necessitated the exclusion of public access and most non-government-related development on the Hanford Site. As a result of its defense-related mission, the Hanford Site has also provided de facto protection of the ecoregion's natural environment and cultural resources.

Elk Calf and Cow Observed During the 2000 Post-Calving Period.

Figure 2-11. Summary of Hanford Site Resources.

Biological Resources - Fish, wildlife, and plant populations and their habitats, including the steppe and shrub-steppe communities of the Columbia Basin ecoregion. Some threatened and endangered species are found at the Hanford Site.

Natural Resources - Minerals (e.g., sand, gravel, and quarry rock), natural gas, surface water (Columbia and Yakima Rivers), groundwater, land, and other natural resources.

Cultural Resources - Prehistoric archaeological sites, Native American sacred and ceremonial places, and historical resources from activities in the 1850's to 1943 (e.g., gold mining, stock raising, and farming) and from 1943 and beyond (e.g., the B Reactor where plutonium for the first atomic explosion was made).

The management of Site resources is subject to federal laws, executive orders, Tribal treaty rights, DOE orders and Hanford Site procedures. The management of biological resources is subject to many requirements, including the requirements of the *Endangered Species Act of 1973*, CERCLA, *Migratory Bird Treaty Act of 1918*, and Presidential Proclamation 7319 of June 19, 2000, which established the Hanford Reach National Monument. The management of historical resources and cultural values is also subject to many requirements, including the requirements of the *National Historic Preservation Act of 1966*, *Archaeological Resources Protection Act of 1979*, *American Indian Religious Freedom Act of 1978*, *Native American Graves Protection and Repatriation Act of 1990*, and "Sacred Sites Executive Order 13007" (61 FR 26771). The management of natural resources is subject to many requirements, including the requirements of the *Clean Air Act of 1977*, *Safe Drinking Water Act of 1974*, *Clean Water Act of 1977*, *Wild and Scenic Rivers Act of 1968*, the *Mining Law of 1872*, the *Federal Land*

Policy and Management Act of 1976, the *Atomic Energy Act of 1954* (AEA), and the *DOE Organization Act of 1977*.

Multiple resource management plans have been developed to protect and provide the policies, goals, and objectives for the management of the Site's biological, natural, and cultural resources. These plans address the ongoing surveillance, protection, and controlled use of the Site's resources. Area management plans are management plans for the resources in specific geographic areas.

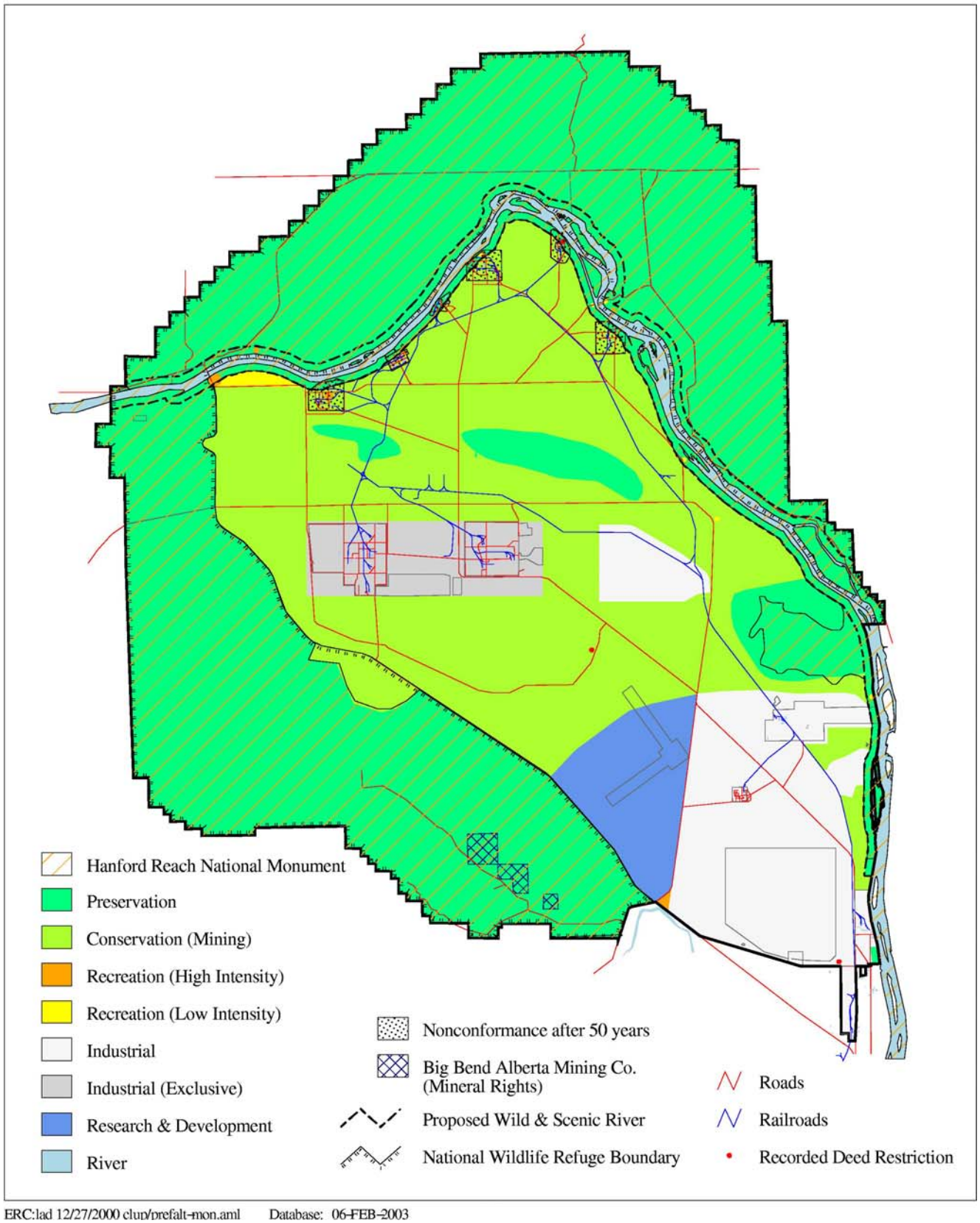
Current efforts by the Hanford Cultural and Historical Resources program focus on identifying important cultural resources at Hanford, establishing relationships with descendant populations and others who value the resources, determining their interests, concerns, and expectations; and identifying forces beyond DOE control that have the potential to adversely impact important cultural resources (e.g., looting, erosion). For more information, refer to Site cultural resource management planning documents.

The CLUP ROD (64 FR 61615) provides the framework within which future use of the Hanford Site's lands and resources will occur while DOE manages the land. The integration of land-use decisions with the other resource management processes is critical to the long-term vitality of the regional ecosystem. This framework provided by the CLUP ROD consists of four basic elements:

1. A land-use map that depicts land uses within specific geographic locations over a 50-year time horizon (see Figure 2-12)
2. Land-use definitions that describe the purpose, intent, and principal uses of each of the land-use designations in the CLUP
3. Policies that direct land use actions and identify resource management plans and area management plans that shall be considered for development or revision
4. Procedures to implement the CLUP and ensure land-use actions are consistent with the CLUP.

Recent land-use actions are being implemented in alignment with the CLUP land-use designations. For example, of the areas designated for preservation, approximately 790 km^2 (305 mi^2) of the Site have been set aside as the National Monument (see Figure 2-12). The National Monument encompasses a large portion of the Hanford Site, including most of the Saddle Mountain National Wildlife Refuge, the North (Wahluke) Slope, the Fitzner-Eberhardt Arid Lands Ecology Reserve, and the former McGee Ranch and Riverland areas. The USF&WS manages the fish, wildlife, and resources of the National Monument on the Wahluke Slope and the Arid Lands Ecology Reserve. The USF&WS is currently preparing a comprehensive conservation plan (CCP) environmental impact statement (equivalent to an area management plan for the National Monument) and DOE is participating in the CCP process. Portions of the National Monument may be transferred to and managed by the USF&WS as early as 2004.

Figure 2-12. Land-Use Map Showing the Hanford Reach National Monument.



DOE may consider additional portions of the Hanford Site to be excess prior to the completion of the cleanup mission. A description of what the Hanford Site might be at the conclusion of cleanup in 2035 from the PMP is in Appendix A.

At the completion of the cleanup mission, the vision for the Site resources includes the following: threatened, endangered, and sensitive species will be under observation but not actively managed by DOE; for land under DOE control, DOE will be cooperating with agencies and environmental organizations that may be establishing and protecting habitats (e.g., USF&WS, Washington Department of Fish and Wildlife); burial "caps" will be controlled with regard to intrusive species (e.g., bio-friendly covers); groundwater will be under use restrictions and some active controls; important cultural resources will have been identified and protected and actively managed by the current land owner; areas under direct DOE administration will have shrunk significantly and the remainder will have either been excessed or transferred to a federal, state, or private entity unless new or ongoing missions are in place at the completion of the cleanup mission.

2.2.2.2 Definition and Scope of the Function "Manage Site Resources"

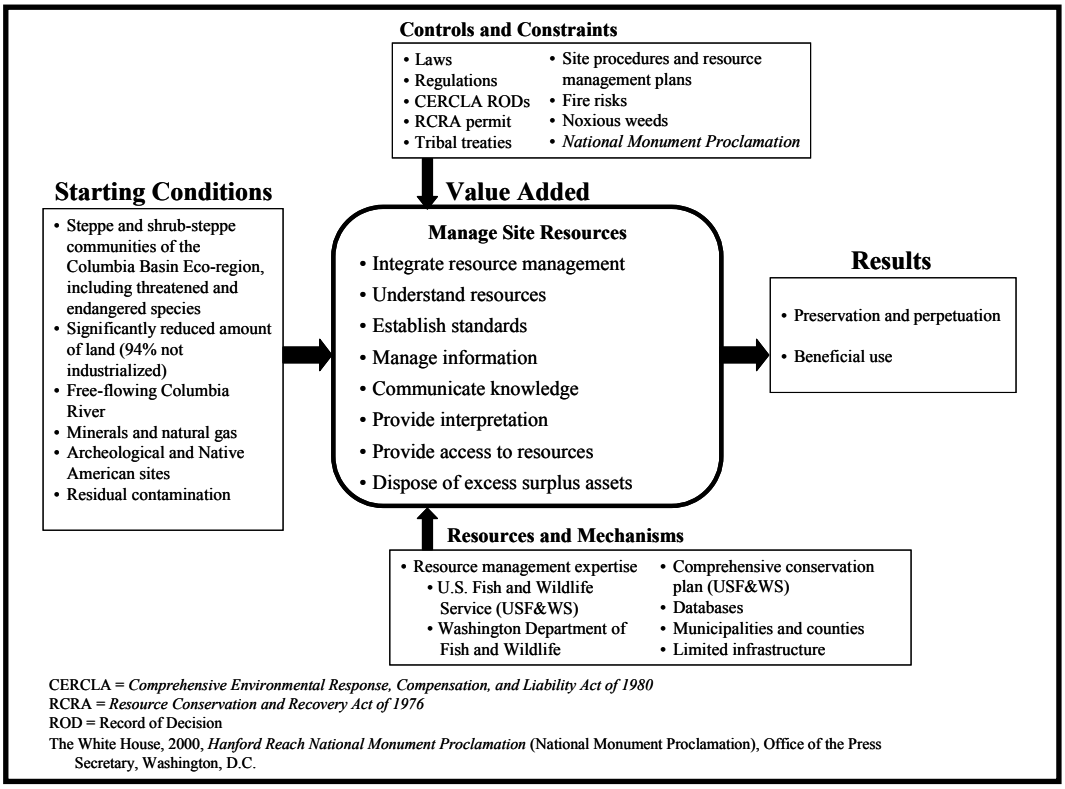
Although the size of the Site is expected to be reduced significantly at the completion of cleanup, DOE will retain responsibility for landlord functions of the reduced footprint as long as DOE is the managing entity of the Site. While DOE remains ultimately responsible for the lands under its management, these functions can be managed by a DOE contractor or delegated to another federal agency. Regardless of the entity that performs this function, a clear understanding of the characteristics, nature, and condition of resources on the reduced footprint shall be maintained and a standard (i.e., basis for comparison) for the Site resources shall be employed to make resource, access, and use decisions. Monitoring, measuring, and evaluating the current condition of the Site resources shall be conducted periodically to ensure no negative impacts from Hanford's DOE activities and the residual contamination. The resources shall be managed with regards to the potential interface with the residual contamination and the potential changes in future use decisions. Accessibility to the Site and its resources shall reflect the restrictions necessary to protect human health and the environment, while at the same time enable controlled access where possible.

2.2.2.3 Benefits

Site biological, natural, and cultural resources will be managed in a safer, compliant, and cost-effective manner with the following benefits (see Figure 2-13):

- Trust responsibilities will be honored
- The CLUP will be implemented regarding the management of the resources
- Site reuse will be supported and access to the resources will be provided, as appropriate
- Species will be monitored and their perpetuation encouraged
- The value of and status of ecological receptors will be communicated to Tribal Nations, local governments, stakeholders, and the public.

Figure 2-13. Value Added by Managing Site Resources.



2.2.3 Manage Stewardship Information

GOAL 3: Reliable and accurate stewardship knowledge is provided to governments and affected parties.

The following sections present background information regarding the management of stewardship information, describe the scope of this function to meet its goal (see Goal 3), and summarize the function's benefits.

2.2.3.1 Background

Stewardship information is the information required to support LTS activities. DOE and others who will be responsible for LTS at the Hanford Site will need ready access to specific and accurate information about the Site to make future use decisions that adequately protect human health and the environment (see Figure 2-14). It is also important for information to be accessible to those who live and work in the surrounding communities and might be affected by the residual contamination and to those who are responsible for community planning and development.

Many of the types of data needed for stewardship are required to be generated under current laws, regulations, or guidelines. Laws and regulations that apply to radioactive and hazardous waste and materials require that certain data be maintained to demonstrate compliance with statutory provisions, including RCRA, CERCLA, and AEA, as well as laws dealing with the protection of historic properties and cultural resources. Numerous DOE orders also contain requirements for generating information.

Figure 2-14. Types of Information That may be Needed to Support Long-Term Stewardship.

- Completion/closure reports
- Custody and long-term care licensing information
- Engineered barrier information
- Environmental and geophysical information
- Groundwater, surface water, and leachate monitoring information
- Health and safety information
- Institutional control information
- *National Environmental Policy Act of 1969* information
- Permits
- Programmatic plans
- Environmental hazards and related monitoring information
- Real estate information
- Records management information
- Inspection and maintenance information
- Surveillance and oversight information
- Site-specific legal agreements
- Use and operations history information
- Waste management and disposal information.

The lengths of time records are retained are based on guidelines called records retention and disposition schedules. These schedules are in accordance with the General Records Schedule provided by the National Archive Records Administration (NARA) (44 USC, Chapter 33 and 36 CFR, Chapter XII, Subchapter B, Part 1228). Under these schedules, certain records are to be retained for a specified length of time and others may be discarded and destroyed immediately. Records retention periods vary from a few months to many decades (e.g., 75 or 80 years) to permanent retention. As of the date of this document, DOE has a moratorium on the destruction of any records in any office on the Hanford Site because of pending litigation.

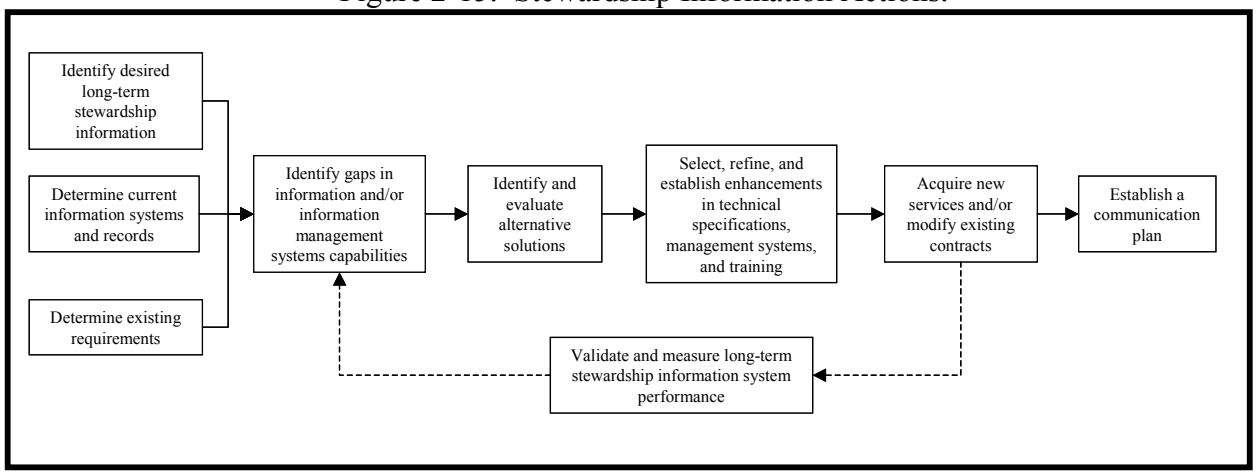
The environmental laws and regulations that apply to DOE also may address the period over which information must be retained. For example, closure plans for hazardous waste units under RCRA must include information on the steps required for closure, and post-closure care requirements, both of which are required for 30 years. The closure report must be placed onto the deed indefinitely (40 CFR 265). DOE is required by the Tri-Party Agreement to preserve for a minimum of 10 years after termination of the Tri-Party Agreement, all of the records in its or its contractors possession related to sampling, analysis, investigations, and monitoring conducted in accordance with the Tri-Party Agreement. After this 10-year period, DOE will notify the EPA and Ecology at least 45 days before destruction or disposal of any such records.

DOE maintains a number of information systems to track, characterize, and manage the cleanup of the Hanford Site. For example, the Hanford Administrative Record contains the body of documents and information that were considered or relied on to arrive at the decisions for remedial action or hazardous waste management. Some of the information systems are available to the general public on the Internet, others are available to DOE personnel and contractors on the Site Intranet, and still others are stand-alone systems. Other options available to persons or organizations outside of DOE who wish to access Site information include public reading rooms, the Hanford Internet site (http://www.hanford.gov/), and *Freedom of Information Act* requests.

2.2.3.2 Definition and Scope of the Function "Manage Stewardship Information"

The necessary and sufficient records and data requirements for LTS will be identified and the associated systems that house and manage the data optimized. With the voluminous amount of data and information that will be available at the completion of cleanup, additional work will have to be done prior to the transition to LTS to identify the specific types of information and storage/retrieval mechanisms for ready availability (see Figure 2-15). Information that might be needed on a regular or continuous basis, or in support of emergency response activities, will be made available for immediate access by the appropriate organizations. Other information required to support LTS activities and inform the public regarding LTS will be readily accessible. LTS information shall be maintained and preserved for the length of time required to support the activities of current and future Site stewards. A communications approach will be developed to provide an opportunity for the surrounding communities, local governments, and Tribal Nations to access information regarding LTS and its activities.

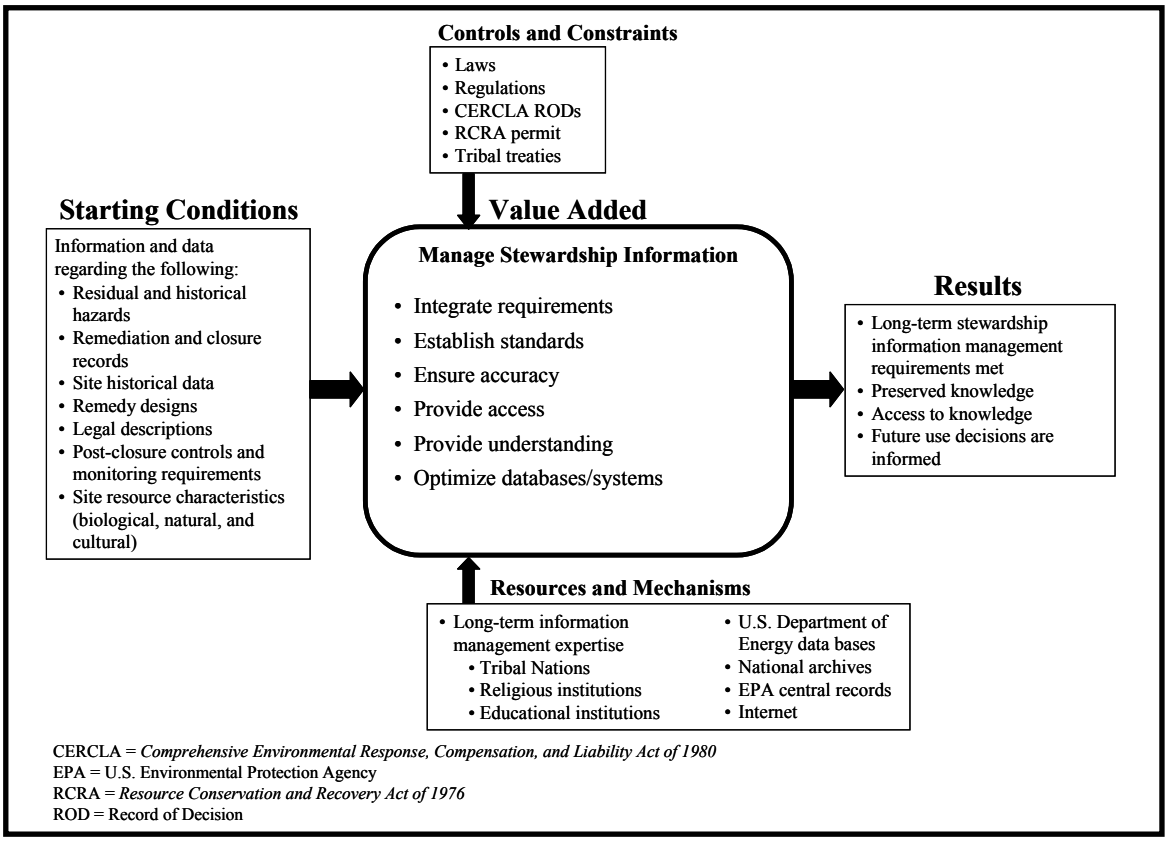
Figure 2-15. Stewardship Information Actions.



2.2.3.3 Benefits

The ability of current and future generations to access and understand Site stewardship information is crucial. The LTS program will help to ensure that the requisite information generated prior to and during the cleanup mission that may be necessary to support LTS is preserved and such information is available to future Site stewards, regulatory agencies, Tribal Nations, local governments, and stakeholders for access in a timely, cost-effective, and understandable manner (see Figure 2-16).

Figure 2-16. Value Added by Managing Stewardship Information.



2.2.4 Use Science and Technology

The following sections present background information regarding the use of science and technology, describe the scope of this function to meet its goal (see Goal 4), and summarize the function's benefits.

GOAL 4: Science is used to understand, predict, and reduce the risks of the long-term interaction of humans, animals, and the environment with residual contamination, while improving the efficiency of the LTS program.

2.2.4.1 Background

LTS activities can benefit from the latest scientific knowledge and the use of advanced technologies in the following areas:

- Monitoring technologies used to evaluate the effectiveness of institutional controls and engineered barriers
- Surveillance technologies used to preclude intrusion into residually contaminated areas

- Technologies related to resource management to help to support the preservation of biological, natural, and cultural resources
- Information management technologies used to preserve long-term stewardship information.

Our understanding and knowledge of science and technology will continue to advance over the long time span of stewardship. For example, the monitoring of engineered barriers may become cheaper and more efficient with the application of advanced technologies, such as remote sensing and electromagnetic moisture sensing methods. Medical science may develop treatments that mitigate or reverse the effects of ionizing radiation. Such a development would affect the cleanup strategies and end states, which would in turn affect LTS needs. Such advances would help DOE perform LTS more efficiently and effectively.

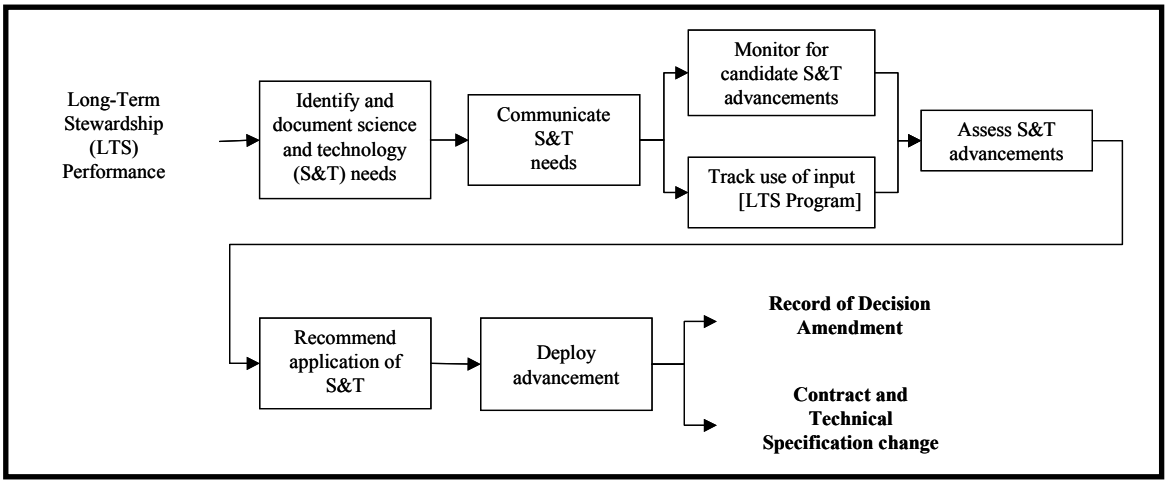
Furthermore, residual material and sites will need to be periodically reevaluated to see if there is sufficient benefit (risk, cost, or source term reduction) in deploying new techniques and remediation efforts to sites within the LTS program.

Lysimeter
(photo provided by another DOE site)

2.2.4.2 Definition and Scope of the Function "Use Science and Technology"

Advances in science and technology will be monitored for and deployed where appropriate to increase the effectiveness of LTS activities by reducing risks and costs, increasing efficiencies, and accelerating the final cleanup. The use of technology advances shall be built in to the CERCLA/RCRA post-closure assessment processes and resulting designs. Potential applications to Hanford will be pursued as results from research and development of scientific knowledge and technologies at other DOE sites become available (see Figure 2-17).

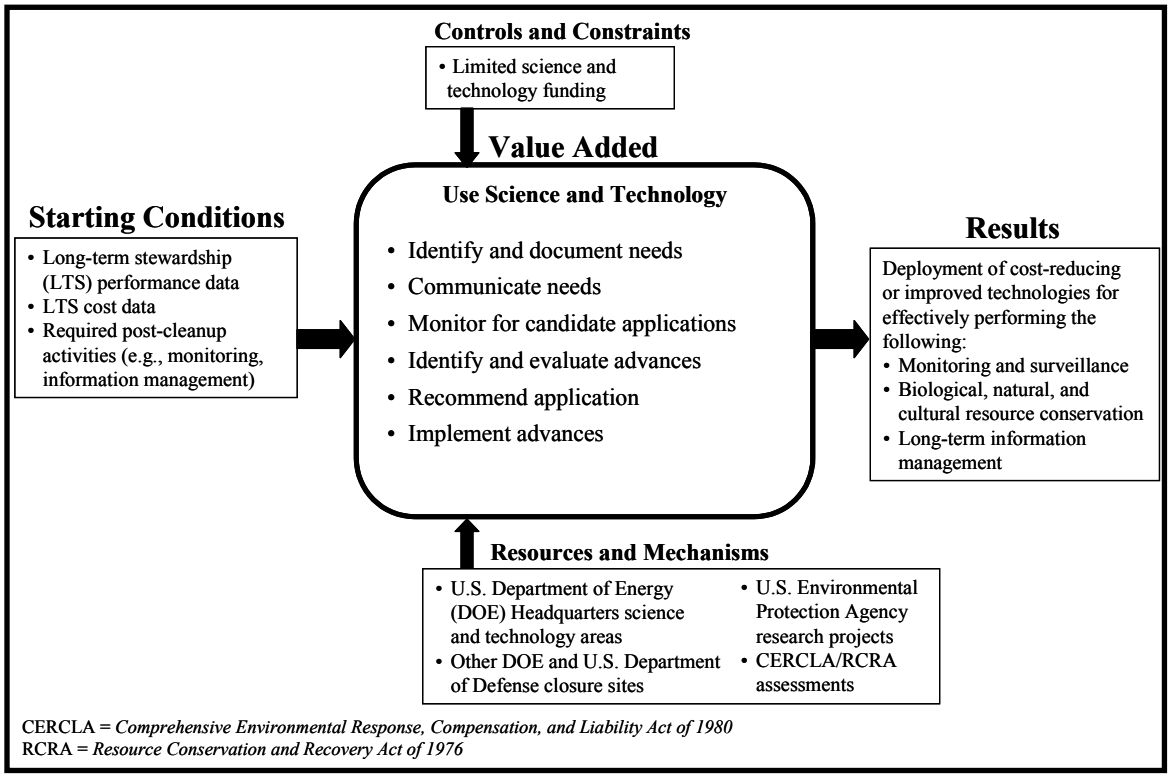
Figure 2-17. Science and Technology Actions.



2.2.4.3 Benefits

Advances in science and technology can have profound influences on the ability to perform LTS more efficiently and effectively (see Figure 2-18).

Figure 2-18. Value Added by Using Science and Technology.



2.2.5 Provide Post-Cleanup Completion Infrastructure

The following sections present background information regarding completion infrastructure, describe the scope of this function to meet its goal (see Goal 5), and summarize the function's benefits.

GOAL 5: Infrastructure is provided for stewardship and ongoing DOE missions that is cost-effective and efficient.

2.2.5.1 Background

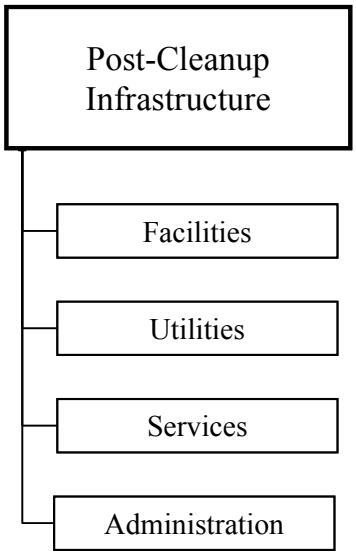
The Site's present infrastructure includes physical and administrative functions that are used to support the Site cleanup and science and technology missions. The infrastructure can be grouped into four main categories: facilities, utilities, services, and administrative (see Figure 2-19). These are referred to collectively as "infrastructure systems."

- **Facilities**. Facilities are the physical infrastructure, which consists of operational facilities (including offices, laboratories, shops, warehouses and active waste management facilities) that may remain on the Site and the transportation system (including roads, railroad, and parking lots). "Shut-down" facilities would be included under the surveillance element of controls.

- **Utilities**. The utility systems providing services to the Site consist of electrical transmission and distribution, raw and potable water, telecommunications, sanitary liquid treatment, solid waste disposal, and steam. Utility systems currently are provided by RL through its contractors.

- **Services**. A number of Site services directly support the infrastructure of the Site. They consist of safeguards and security, fire protection, emergency preparedness, maintenance services, and other support activities (e.g., analytical services).

Figure 2-19. Key Elements of the Post-Cleanup Infrastructure Work Breakdown Structure.



- **Administrative**. The administrative element of infrastructure includes the following areas: regulator, stakeholder, and Tribal Nation interface (i.e., external affairs); interagency coordination; and program management, which includes legal, human resources, financial, and contracting services. Program management also includes the management of easements across the Site. The administrative elements that are expected to be unique to the post-cleanup completion period include post-cleanup completion worker benefits.

As the Site progresses towards cleanup completion, the mission need for the infrastructure will be reduced significantly in specific geographic areas. It is anticipated that Pacific Northwest National Laboratory operations will continue. There may be additional DOE or other federal missions at the Site when cleanup is complete. As a result, it may become more cost effective to provide some of the infrastructure systems through other means or certain infrastructure structures may no longer be needed by DOE. Elements of the current infrastructure capacity or the LTS related infrastructure might then be reduced, contracted, or remotely supplied by another DOE field office.[7]

[7] Long-term stewardship operations at some DOE sites where the selected remedy has been implemented and protectiveness has been achieved are already managed remotely by the DOE Grand Junction Office. For more information, see *Long-Term Surveillance and Maintenance Program 2001 Report*, GJO–2002–285–TAR

2.2.5.2 Definition and Scope of the Function "Provide Post-Cleanup Completion Infrastructure"

The necessary and sufficient infrastructure for supporting LTS and ongoing missions shall be maintained. Infrastructure systems may be provided by offsite service providers when it is not cost effective for DOE and its contractors to perform the service on Site.

The current infrastructure systems and services and the anticipated need for each at the completion of the cleanup mission are listed in Table 2-1. For example, at the point where maintaining paved roads for safe transport of material and personnel and ongoing operations is no longer necessary, the roads would no longer be maintained and/or the roads could be transferred to the local jurisdiction if the roads are still of value. However, some infrastructure will be required in some areas following the completion of the DOE cleanup mission to support the continuing mission activities of another area (e.g., roads for accessing other areas of the Site). These needs may be met by offsite contractors.

Portable Facilities

As another example, it is envisioned that the need for a complex electrical distribution system in the more remote areas will diminish as the cleanup progresses. At some point the electrical distribution system will no longer be required. At that point in time, the monitoring systems left in place in those areas will be powered by alternative means (such as solar) and transmit (through wireless means) their data back to a remote monitoring station. As with the electrical distribution system, the need for a hardwired telecommunications system will diminish. With the completion of the cleanup mission the landlord infrastructure elements necessary to support the remaining Site operations will be transferred from EM to the future Site manager or another federal entity.

Table 2-1. Infrastructure Elements and Their Anticipated Importance in Supporting Post-Cleanup Stewardship and Continuing Missions.

Infrastructure	Element	Anticipated Post-Cleanup Completion Need [a]
Facilities	Office	Limited
	Shop	Limited
	Warehouses	Limited
	Training	Limited
	Waste Processing	Limited
	Waste Shipping	Limited
	Laboratory	Limited
Utilities	Electrical	Yes

Table 2-1. Infrastructure Elements and Their Anticipated Importance in Supporting Post-Cleanup Stewardship and Continuing Missions.

Infrastructure	Element	Anticipated Post-Cleanup Completion Need [a]
	Telecommunications	Yes
	Water	Yes
	Sanitary Waste	Yes
	Steam	TBD
Services	Security	Yes
	Fire Protection	Yes
	Maintenance	Yes
	Emergency Services	Yes
	Analytical Services	Yes

[a]The information presented in this table is preliminary. Further analyses will be conducted to identify the specific infrastructure needs anticipated for post-closure, as well as an evaluation of the types of services and locations of facilities that can be provided to meet those needs.
TBD = To be determined

2.2.5.3 Benefits

Cost savings will be achieved through the use of infrastructure systems that are reduced in cost and complexity for the purposes of LTS (see Figure 2-20). Such systems will provide the critical support needed for the safe and compliant implementation of stewardship activities.

2.2.6 Integrate Long-Term Stewardship Responsibilities

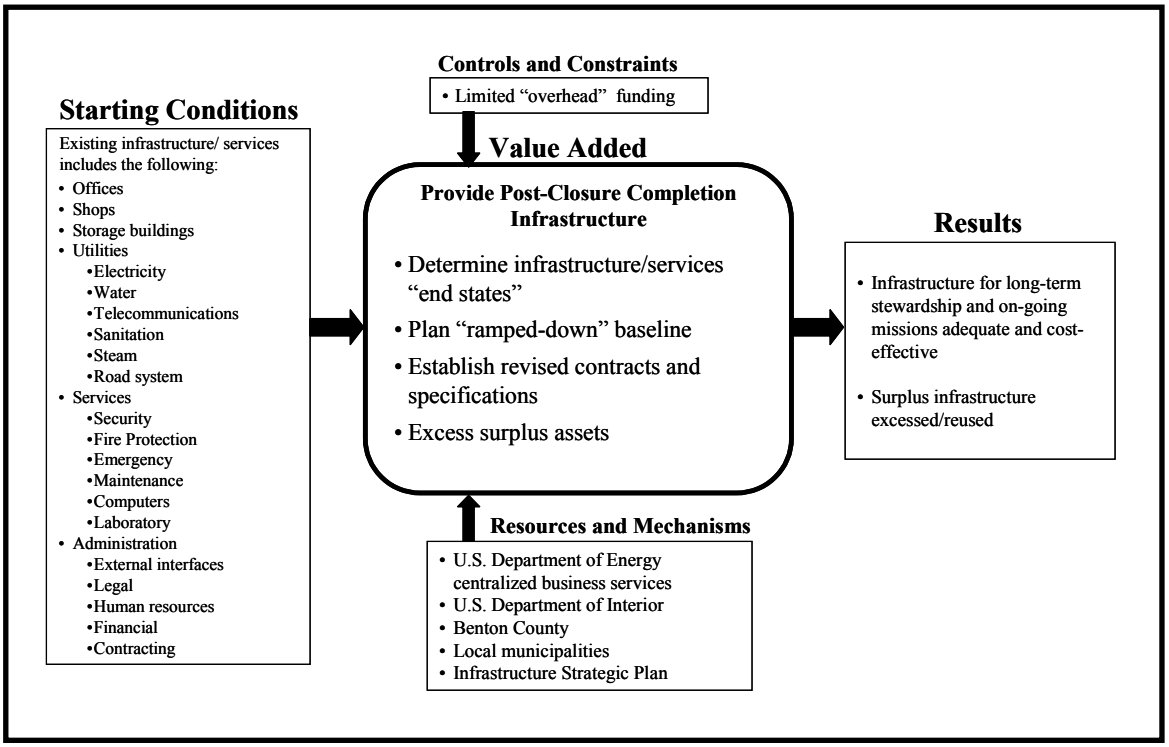
The following sections present background information regarding the integration of LTS responsibilities, describe the scope of this function to meet its goal (see Goal 6), and summarize the function's benefits.

GOAL 6: The LTS program is designed and operated to achieve an integrated, holistic, and multi-generational approach.

2.2.6.1 Background

The various functions that implement the LTS strategies are described in Sections 2.2.1 through 2.2.5. LTS types of activities that historically have spanned multiple programs and have been managed as discrete programs will be integrated when conducting the new LTS program. Identifying the key interfaces between the activities is an important step in this integration.

Figure 2-20. Value Added by Providing Post-Cleanup Completion Infrastructure.



The key interfaces between the functions and their relationships are depicted in Figure 2-21. A simple example of the relationships between these functions is the relationship between ensuring controls and managing Site resources. Fences, installed to prevent intrusion and minimize the risk of exposure to the residual contamination, may affect wildlife foraging and migration patterns. The location of the fences must be integrated with land use and resource management plans to ensure the effectiveness of both the control and the resource management plans.

Furthermore, two of the LTS functions–manage stewardship information and use science and technology–are inherently related to the other functions. Much of the information to be managed includes the information related to ensuring controls and managing Site resources. Similarly, the development of new and improved technologies might help to accommodate fewer land-use restrictions or to develop more cost-effective and efficient surveillance equipment for controls and Site resources.

The planning and coordination of the activities within each of the various functions implementing LTS require an understanding of the changing nature of the environment within which LTS occurs. Program resources, and controls and constraints considered in the development of the LTS functions are likely to change significantly over time (see Figure 2-22). As a result, the integration of the functions will be flexible and evolutionary in nature and include a continuous evaluation to identify improvement opportunities.

Figure 2-21. Key Interfaces in the Long-Term Stewardship Program.

Implementation Functions (Middle Squares)	INPUT TO FUNCTIONS (COLUMNS)/ INTERFACE				
OUTPUT TO FUNCTIONS (ROWS)/ INTERFACE	**Manage Residual Risks**	Site resources are protected from residual contamination; engineered barriers and physical controls prevent or otherwise affect the movement of wildlife	Information on existing controls that needs to be preserved for the long-term	Need for improved technologies so that controls can be developed, installed, maintained, and monitored more cheaply, more quickly, and result in improved performance	Need for infrastructure to conduct surveillance, maintenance, and monitoring of controls
	Knowledge regarding the resources that are protected by the controls and that may adversely affect controls	**Manage Site Resources**	Resource Management Plans; tracking and surveying results	Need for improved technologies so that management of Site resources can be done more cheaply, more quickly, and result in improved performance	Need for infrastructure to manage Site resources
	Geographic information system withWeb-enabled, multigovernment-linked information on remediation, controls, and Site resources and backup archive and records retrieval system	Information on Site resources	**Manage Stewardship Information**	Need for improved technologies so that preservation of information can be done more cheaply, more quickly, and result in improved performance	Information on what infrastructure remains and where it is located
	Deployment of cost-reducing or improved technologies in surveillance, maintenance, and monitoring; health effects knowledge	Deployment of cost-reducing or improved technologies in the conservation of Site resources; health effects knowledge	Deployment of cost-reducing or improved technologies in long-term information management	**Use Science and Technology**	Deployment of cost-reducing or improved technologies in providing post-cleanup infrastructure
	Infrastructure to support the maintenance and monitoring of controls	Infrastructure to support the management of Site resources	Infrastructure to support the management of information	Infrastructure to support the research and development related to long-term stewardship	**Provide Post-Cleanup Infrastructure**
	Integration helps to support decision making, ensure consistency, and provide opportunities to gain efficiencies				

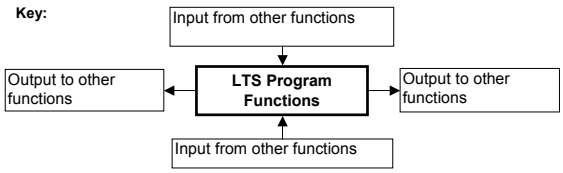
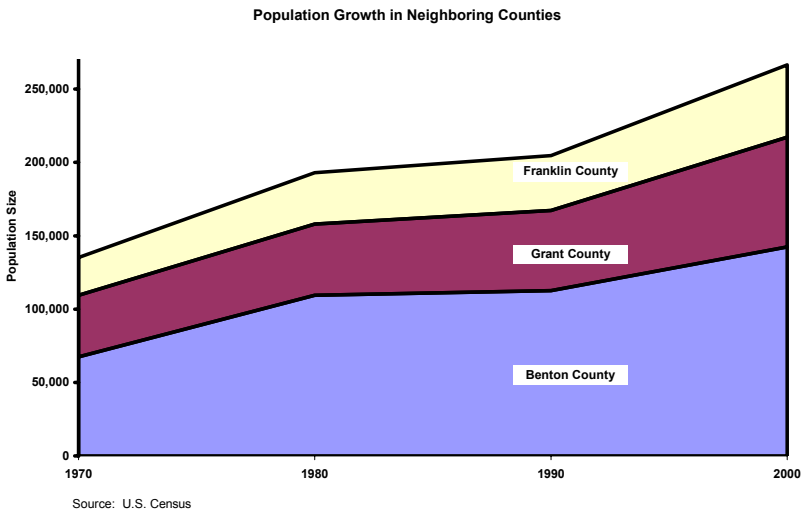


Figure 2-22. Examples of Dynamic Influences on Long-Term Stewardship.

- The nature and characteristics of both the area and the surrounding region change over time. For example, changes in the populations of the surrounding communities can affect the demands on the use of the Site and the property bordering the Site. If the population in the surrounding communities continues to grow, limited land availability could increase the relative value of property that has low levels of residual contamination.
- The characteristics of the residual contamination will change as a result of cleanup activities and, potentially, other influences (e.g., passage of time, meteorological changes, hydrogeological changes).



- The characteristics of the Site biological, natural, and cultural resources may change over time (e.g., resident species may be newly listed or delisted as endangered or threatened).

2.2.6.2 Definition and Scope of the Function "Integrate Long-Term Stewardship Responsibilities"

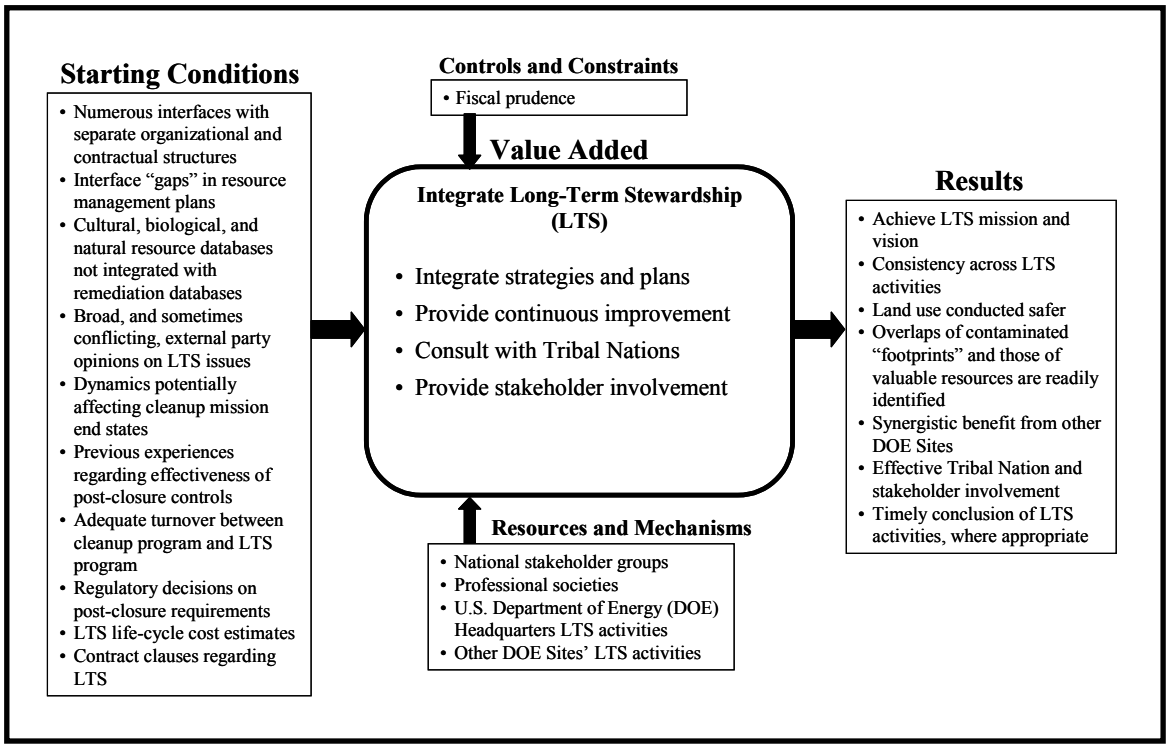
Integration will include the identification and specification of various Site functions and requirements that support LTS; the addressing of contracting issues; the identification of the relationships, or interfaces, among these functions; and the planning and coordination of the activities within each of these functions to achieve the LTS mission, vision, and goals. This function also will include integration with other missions that may be ongoing at the Hanford Site, other DOE sites, DOE Headquarters, local governments, and other entities that may be managing portions of land that were previously part of the Hanford Site.

Bull Elk

2.2.6.3 Benefits

Integration of the LTS activities is key to effectively achieving the LTS mission and vision (see Figure 2-23) in a safe and cost-effective manner. Integration will ensure credible communication with surrounding communities. LTS activities must be conducted in a manner that is mutually supportive in reaching the same goals. Integration of the LTS activities will allow for a timely conclusion of LTS, ensure consistency among the varied LTS activities, and provide opportunities to gain efficiencies in a safe manner, which may result in lower future costs.

Figure 2-23. Value Added by Integrating Long-Term Stewardship Responsibilities.



3.0 ACTIONS TO ENABLE THE TIMELY TRANSITION FROM CLEANUP TO LONG-TERM STEWARDSHIP

DOE's commitment to meeting its long-term, post-cleanup obligations is demonstrated by the definition of the future LTS program that is presented in Chapter 2. However, DOE's commitment to meeting its obligations extends beyond simply defining such a program for the future. DOE plans to take actions now to ensure that it will meet its post-cleanup obligations. This chapter presents the actions that will be taken within the next 5 years—prior to the completion of the cleanup mission—to ensure that the program is in place at the time of turnover, ready to meet the obligations in a safe, compliant, and cost-effective manner.

Identification of the actions was based on a review of the anticipated LTS program functions, as described in Chapter 2, and a determination of what is prudent to be accomplished now, prior to the transition to the LTS program. Cleanup decisions being made today have long-term implications that must be adequately considered and evaluated. Input provided at DOE-sponsored focus groups, as well as comments received from the public on the working draft of this document, also were considered in the development of these actions. This chapter attempts to address concerns expressed by the local and national stakeholders regarding DOE's planning for LTS, in support of accelerated cleanup. The actions also were identified through a basic project programmatic risk analysis that helped to reveal some of the potential risks to, or vulnerabilities of, the transition process. The high-priority actions that must be initiated in the near-term to address the greatest immediate, potential vulnerabilities of the transition process are listed in Figure 3-1.

Figure 3-1. High-Priority Transition Preparation Actions.

- Action 1: Establish the interface between the cleanup program and the long-term stewardship program, and identify the necessary transition activities
- Action 2: Provide input to cleanup decisions
- Action 7: Assist in identifying information management requirements
- Action 10: Assist in reducing infrastructure to that minimum necessary to support long-term stewardship needs
- Action 11: Monitor and benchmark national long-term stewardship activities.

Note: These 5 actions are listed in the order in which they appear in Chapter 3 and their position is not intended to imply any further ranking among the high-priority actions.

DOE recognizes that this chapter may not currently include all of the actions needed to ensure a successful and smooth transition and it may not conduct every action as described in this chapter. DOE will continue to identify ways to better prepare for the transition, including evaluating the lessons learned at other DOE sites and from other agencies (e.g., U.S. Department of Defense) that are addressing, or have addressed, similar issues. As such, this transition-planning document may be considered a "living document," one that will continue to be reviewed, evaluated, and updated as appropriate.

Actions are described in the following sections for each of the 6 anticipated LTS program functions. The actions are generally presented in order of priority within each section; however, the definition, selection, and ranking of the actions may be modified as these actions are implemented and further evaluated. Many of the actions are directly related and thus, may overlap in some areas. As stated in Chapter 1, this document is to be used as an internal DOE management tool. The actions presented in this chapter do not impose any legal or regulatory obligations.

3.1 PREPARATIONS FOR "MANAGING POST-CLEANUP COMPLETION RESIDUAL RISKS"

In preparing to manage post-cleanup completion residual risks, the following actions have been identified to help ensure a successful and smooth transition.

Action 1: Establish the Interfaces between the Cleanup Program and the Long-Term Stewardship Program, and Identify the Necessary Transition Activities

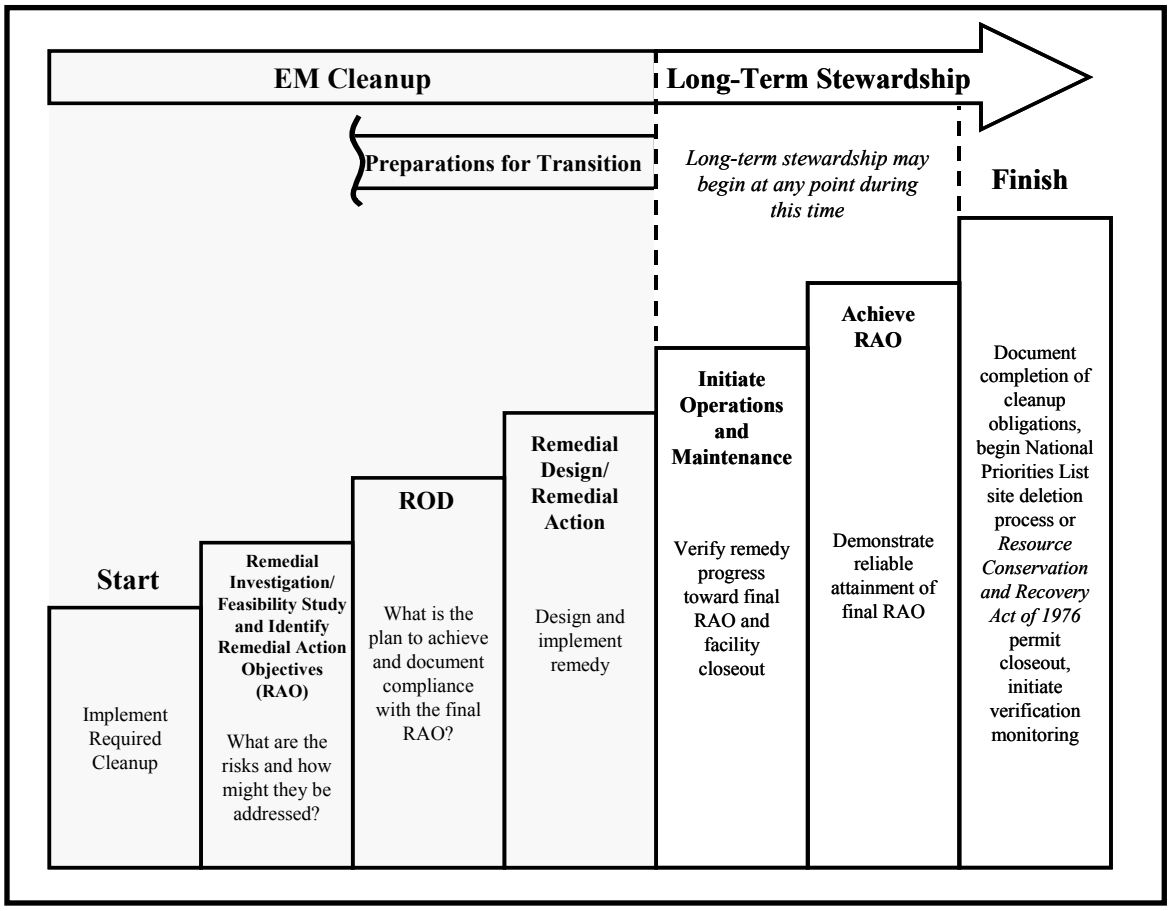
While the future LTS program will be separate and distinct from the cleanup program, it will be important to define the point at which the transfer occurs between the two programs, i.e., when the cleanup mission ends and when LTS begins (see Figure 3-2). The definition of the interface between the two organizations will be based on DOE policy decisions regarding the relationship between EM and the future Headquarters office that addresses LTS.[8] It is also important to create a framework for the minimum set of actions that need to be conducted to ensure a successful and smooth transition. These actions will include the development of the acceptance criteria and a corresponding checklist for land that will be transitioned to the future LTS program.

Examples of potential lines of inquiry for the checklist include the following (see Figure 3-3):

- *Performance metrics must be defined*. Performance metrics may include the factors that must be monitored; the frequency and length of time for which the factors must be monitored; and the thresholds for achieving the remediation goals (e.g., groundwater will be monitored every "X" days for contaminant "Y" until the concentration of the contaminant has been reduced to "Z"). These performance metrics also will provide the information needed by the LTS program to clearly identify when any remaining restrictions or institutional controls on the land may be terminated. Based on regulatory requirements, the completion of LTS will be demonstrated through the use of these performance metrics.

[8] The DOE, in the fiscal year 2004 budget request, is proposing to establish an Office of Legacy Management that will be responsible for ensuring that DOE's post-closure responsibility, including the administration of long-term pension and medical benefits for former contractor personnel and environmental surveillance and maintenance, are fulfilled.

Figure 3-2. Steps to Complete Cleanup and the Potential Point of Turnover to Long-Term Stewardship.



- *The preparation for responding to off-normal events, including the discovery of previously unknown sources of contamination*. Off-normal events occur when a protective system unexpectedly performs outside of the expected range of acceptable performance (e.g., a spill of hazardous waste during well sampling operations, the deterioration of a physical control beyond predicted levels).
- *The existence, format, and availability of information needed for long-term stewardship*. This includes information regarding the types, locations, and objectives of the engineered and institutional controls (e.g., deed restrictions); the required maintenance and monitoring activities to

Figure 3-3. Sample Long-Term Stewardship Program Acceptance Checklist.

- ✓ Performance metrics
- ✓ Preparation for off-normal events, including previously undiscovered contamination
- ✓ Information needed for long-term stewardship
- ✓ Review of emergency management plan.

These and other acceptance criteria will be developed to support transition from cleanup to long-term stewardship.

ensure performance of the controls; characteristics of the residual contamination (e.g., final risk assessment); the length of time the institutional controls must remain in place; and procedures for modification or termination of the controls. (See also Action No. 7.)

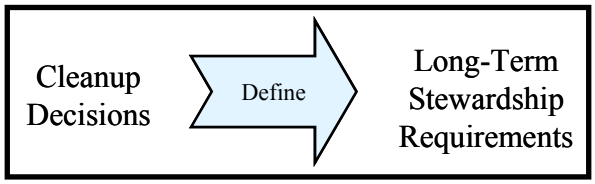
- *The review of the emergency management plan associated with the land*. This review will help to ensure response measures are adequately defined for the types of emergencies that may occur during LTS.

Further details regarding the interface and how it will be managed at RL will be defined using the Richland Integrated Management System based on the LTS transition activities described in the remainder of this chapter and the program description presented in Chapter 2.

Action 2: Provide Input to Cleanup Decisions

DOE will work to provide LTS information to the cleanup decision-makers to ensure consistency and provide opportunities to gain efficiencies. Cleanup decisions being made now will define the requirements for post-cleanup activities (see Figure 3-4). The specific LTS needs will depend directly on the cleanup strategy implemented, the end state achieved, and desired future uses. Therefore, it is important for those decisions to consider LTS factors, including the life-cycle costs of cleanup and LTS.

Figure 3-4. Cleanup Decisions Will Affect Long-Term Stewardship.



The approved regulatory processes for cleanup involve developing remediation goals consistent with a set of threshold (or performance) criteria and balancing criteria, identified in DOE orders, guidance documents for complying with RCRA, and the CERCLA National Contingency Plan (40 CFR 430). These criteria include factors related to LTS, such as the long-term effectiveness and permanence of the alternative, projected life-cycle cost, anticipated future use, and degree of certainty that the alternative will prove successful.[9] LTS principles, based on the values described in Chapter 2, will be used to help guide the development of the remediation goals, particularly for those criteria with long-term implications, and to support consistency among the cleanup decision documents. The incorporation of these factors today will lead to a safer, compliant, cost-effective program in the future.

Action 3: Assess Performance of Current Institutional Controls

The more information that is gained regarding the effectiveness of different types of institutional controls in protecting human health and the environment, the better DOE will be able to design and implement institutional controls that are effective for the long term. Lessons can be learned

[9] For more information regarding the regulatory criteria, refer to the Long-Term Stewardship Study, (66 FR 56664); 40 CFR 300.430; and EPA/540/G-89/004, 1988, G*uidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (Interim Final)*, U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, OSWER Directive 9355.3-01.

now from a review of the effectiveness of institutional controls currently in place at the Hanford Site, as well as from a review of the lessons learned from the use of institutional controls by other agencies and the private sector (see Action No. 11). These lessons can be considered during the cleanup decision-making process as the post-cleanup obligations are being defined. DOE will review the results of the performance assessments of institutional controls and determine how the lessons learned from these results should be applied to current decisions regarding requirements for the controls.

Action 4: Validate that the Environmental Management System Included in the Integrated Safety Management System is Adequate for Long-Term Care

The long-term implications of the DOE environmental management system will be evaluated to ensure an integrated safety, health and environmental program that effectively protects the workers, the public and the environment for the long-term. The environmental management system is designed to apply the requirements and stipulations of DOE O 450.1, *Environmental Protection Program,* to ensure sound stewardship of natural, historical, and cultural resources that have been affected by past DOE operations, and at the same time promote long-term stewardship of the Hanford Site's natural and cultural resources throughout its operational, closure, and post-closure life cycle. The integrated environmental management system provides a methodology for cost-effectively meeting or exceeding compliance with appropriate environmental laws, regulations, and requirements through a continuous cycle of planning, implementing, evaluating, and improving processes and actions taken by DOE to achieve predetermined environmental goals. In this way, the environmental management system becomes a key component of the integrated safety management system by incorporating core principles and functions into the environmental management system baseline and the execution of its processes.

3.2 PREPARATIONS FOR "MANAGING SITE RESOURCES"

The following actions have been identified to help ensure a successful and smooth transition regarding the management of Site biological, cultural, and natural resources for the reduced area of land that is expected to remain within DOE management control.

Action 5: Ensure Consistency of Resource Management Plans with Post-Closure Risk Management

The purpose of this action would be to review the resource management plans for consistency and identify possibilities to consolidate them in a cost-effective approach. Resource management plans describe the policies, goals, and objectives of the Site's biological, natural, and cultural resources and for specific resources. These plans address the ongoing surveillance, protection, and controlled utilization of the Site's resources.

Action 6: Assist Conversion of Site Resource Management Plans into Richland Integrated Management System

In preparation for LTS, the management of key Site resources will be integrated by developing associated procedures and contractor requirements documents in the Richland Integrated Management System (RIMS). RIMS is the management system used by Hanford to define DOE's work processes, along with the roles, responsibilities, accountabilities, and authorities for DOE organizations. Conversion of the management of the biological, natural, and cultural resources into the RIMS, prior to the transition, will help to ensure the resource management plans are integrated and consistent with the mission and vision of LTS. Site resources will be managed in an integrated manner considering the context of other DOE, federal, and local mission activities; the uses of neighboring properties; and the mid-Columbia ecosystem.

3.3 PREPARATIONS FOR "MANAGING STEWARDSHIP INFORMATION"

A successful and smooth transition will require careful consideration of issues regarding the existence, quality, availability, and sharing of stewardship information, including the following actions.

Action 7: Assist in Identifying Information Management Requirements

The types of information required to be maintained and preserved for LTS must be identified well in advance of the completion of the cleanup mission to ensure these records are maintained, preserved, and accessible to support the LTS program. Records containing information that will be required to support LTS are being generated, maintained, indexed, and archived in an ongoing basis at the Hanford Site. Using a requirements-based approach, planning must occur now regarding the indexing, storing, and physical location of these records to support necessary retrieval and use by the LTS program (see Action No. 1). Also, if the current moratorium on the destruction of Hanford records is lifted, some of the records may be destroyed in accordance with DOE records retention requirements. Many of these records may be important to LTS. DOE will evaluate the information requirements for LTS, develop a strategy to identify the records containing that information (e.g., assign an "LTS" tag to appropriate records), review the contents and capabilities of the current information management systems, evaluate current records retention requirements, and determine any changes that may be required to the current information management system in preparation for LTS. DOE at the national level is currently developing planning guidance for the management of LTS records. To ensure compatibility with the Hanford information management systems and process and to increase cost-effectiveness, this becomes an action that must be implemented in the near term.

Action 8: Assist in Development of Communication Approach

DOE plans to develop a communications approach that provides an opportunity for the surrounding communities, local governments, and Tribal Nations to access information regarding the Site during LTS (see Figure 3-5). It is important to develop an approach now, prior to the completion of the cleanup mission, to identify the information that will be needed by what organizations and for what purposes and in what format. The length of time in which the information must be retrieved, i.e., required speed of retrieval, also will be considered. The communications approach will both inform and educate others regarding post-cleanup residual contamination and Site cultural, biological, and natural resources. DOE will make an effort to seek external input in the development of the approach.

Figure 3-5. Potential Communication Media Forms.

- Databases
- Fact sheets
- Personal communications
- Public documents
- Reading room
- Web site
- Workshops.

These and other forms will be considered in the development of a communications approach.

3.4 PREPARATIONS FOR "USING SCIENCE AND TECHNOLOGY"

In preparing to use science and technology to support LTS, the following action has been identified to help ensure a successful and smooth transition.

Action 9: Provide Input for Science and Technology Long-Term Stewardship Needs

To the extent possible, DOE will identify the science and technology needs for LTS early enough in the planning processes to achieve out-year efficiencies and cost reduction. LTS activities can benefit from the latest scientific knowledge and the use of advanced technologies in monitoring, surveillance, information management, and other technologies. Identification of the science and technology needs will enable them to be integrated into research and development initiatives and increase the probability of such needs being met. Advances in science and technology will support the performance of LTS activities in a safe, compliant, and cost-effective manner. Furthermore, advances in science and technology regarding cleanup activities may reduce or eliminate the need for particular LTS activities.

3.5 PREPARATIONS FOR "PROVIDING POST-CLEANUP COMPLETION INFRASTRUCTURE"

Planning for the provision of the infrastructure that will be needed for LTS, as described in the following action, must occur prior to the transition. The definition of this action may be modified as it is implemented and further evaluated.

Action 10: Assist in Reducing Infrastructure to that Minimum Necessary to Support Long-Term Stewardship Needs

Immediate cost savings can be achieved by focusing on maintaining those infrastructure systems that will be required for an extended period of time at their minimum necessary level of operation. The remainder of the systems will be operated to failure. As the cleanup is completed and the scope of responsibility for DOE decreases, a commensurate reduction in the extent of infrastructure also will occur. However, sufficient infrastructure to support LTS must be available (see Figure 3-6). DOE will integrate infrastructure requirements for supporting LTS into the planning decisions for the cleanup. Factors that may be considered include the following:

- The cost of providing the infrastructure compared to the money that can be saved to further accelerate cleanup
- The infrastructure systems that will still be needed to support LTS
- The potential savings for obtaining infrastructure systems through offsite service providers rather than DOE and its contractors performing the service on Site
- The value of existing systems in terms of their ability to be reused and the cost of maintaining such systems in anticipation of future reuse.

Figure 3-6. Infrastructure Systems.

Infrastructure that may be needed on Site or off Site to support long-term stewardship includes the following:

- Analytical laboratories
- Electricity
- Fire protection
- Parking lots
- Raw and potable water
- Roads
- Telecommunications
- Warehouses and maintenance buildings.

These and other requirements for infrastructure to support long-term stewardship will be identified.

3.6 PREPARATIONS FOR "INTEGRATING LONG-TERM STEWARDSHIP RESPONSIBILITIES"

The following actions have been identified to help ensure a successful and smooth transition regarding the integration of LTS responsibilities with other DOE entities and external organizations.

Action 11: Monitor and Benchmark National Long-Term Stewardship Activities

There are a number of activities related to LTS (e.g., information management planning, institutional control implementation) that are currently being implemented at other DOE sites, at DOE headquarters, and by other federal agencies (see Figure 3-7). Because of the opportunity to observe these activities prior to the commencement of LTS at the Hanford Site, the LTS program will be better prepared to reduce risk, reduce costs, and increase efficiencies of its activities. The progress of these activities will be tracked and monitored, and the lessons learned from these organizations will be assessed for their applicability to the Hanford Site.

Action 12: Consult with Tribal Nations, Local Governments, Stakeholders, and Public

The development of this document, including the public comment period regarding the working draft, reflects DOE's commitment to continue to include Tribal Nations, local governments, and stakeholders in the LTS planning process. It is important for the Tribal Nations, local governments, and stakeholders to continue to add value to the planning process for LTS. These organizations consist of and/or represent those who will live in the communities in proximity to the Hanford Site after the cleanup mission is completed. Also, such participation will help to ensure an effective implementation of a government-to-government relationship with the Tribal Nations.[10]

Figure 3-7. Examples of Other Federal Agencies Evaluating and Implementing Various Long-Term Stewardship-Related Issues.

Action 13: Continue to Anticipate Potential Programmatic Risks to Stewardship Transition

Transition activities will include the periodic assessment of potential programmatic risks to the ability of the LTS program to accept responsibility for land ready for transfer to the program. Programmatic risks are vulnerabilities in meeting the program's objectives due to undesirable events that have some probability of occurring. For example, to support an accelerated schedule, it is important that when cleanup is completed and the transition of land from the cleanup program to the LTS program is scheduled to occur, that the land meets the acceptance criteria of the LTS program (see Action No. 1). If the land does not meet the acceptance criteria, delays in the EM completion schedule may occur and the long-term costs for managing the land may increase. Another potential programmatic risk is the possible loss of information that will be required to support LTS (see Action No. 7). Therefore, to ensure a smooth and successful transition, DOE will identify the potential programmatic risks and develop an associated risk-management approach.

Action 14: Assist in Evaluation of Changes in Land Use

LTS values must be considered in decisions regarding the changes in land use, particularly for parcels of land with post-cleanup obligations or for parcels that are located near such land. Land uses that will be available following completion of remedial action are determined as part of the remedy selection process. Changes in land use will be evaluated in accordance with cleanup

[10] For more information regarding consultation with Tribal Nations, refer to the *U.S. Department of Energy American Indian & Alaska Native Tribal Government Policy* (DOE 2000).

requirements to ensure remedies remain effective in protecting human health and the environment.

Action 15: Assist the Safe Transfer of Surplus Land

As portions of the Site for which the DOE no longer has a mission need are designated as surplus, a plan (or project) to transfer these areas in a safe, compliant, and cost-effective manner to other non-DOE entities (i.e., other federal agencies, local governments, or private entities) will be developed. If long-term response actions are required (e.g., groundwater pump-and-treat systems), or if cleanup has not resulted in an unrestricted-use standard, DOE will take the requisite steps to ensure controls are in place in accordance with the applicable regulatory requirements and that the controls are transferred using the appropriate mechanism. It is intended that the entities receiving the land will maintain and monitor the institutional controls (or their equivalent) that DOE has put in place or that DOE will retain the right of access to the property to continue that responsibility. There are several CERCLA requirements that DOE must meet to ensure the safe transfer of land. These requirements include reporting where hazardous substances have been stored for at least 1 year, disposed of, or released; retaining liability as the potential responsible party; and retaining federal government property interests for contaminated DOE land that is transferred to the private sector. Lessons learned from a review of the transfer of land by other DOE sites, federal agencies, and the private sector will be considered (see Action No. 11). DOE will involve EPA and the State in discussions to ensure that appropriate provisions are included in the conveyance documents to maintain effective institutional controls.[11]

Action 16: Develop Long-Term Stewardship Transition Project Plan

To further define the transition activities, a DOE project plan will be developed for actions in the near term (up to 5 years in the future), to describe the functions, roles, responsibilities, and schedule for the transition. The LTS goals and functions presented in Chapter 2 will serve as the foundation for the project plan's objectives and scope. The development of the project plan also will include the consideration of lessons learned regarding LTS planning from other DOE sites, other agencies, and the private sector (see Action No. 11). The project plan will help to ensure the appropriate factors have been considered prior to implementation of LTS and will support the achievement of the LTS program mission and vision. This DOE planning document will be reviewed periodically as the transition is further defined.

[11] Further information regarding the use of institutional controls when land is transferred to another entity is provided in the *Sitewide Institutional Controls Plan For Hanford CERCLA Response Actions*, DOE/RL-2001-41.

4.0 COMPLETION OF LONG-TERM STEWARDSHIP FOR THE U.S. DEPARTMENT OF ENERGY

Completion of long-term stewardship will be determined based on an evaluation against performance metrics established during the cleanup decision-making process.

It is currently anticipated that LTS for a particular parcel of land is no longer needed when the land, groundwater, and surface water have been released for unrestricted use. Some portions of the Site may require LTS in perpetuity. For other portions, DOE's LTS activities may be considered complete when the LTS performance metrics are met and/or ownership (or administration) is transferred to another entity and any remaining long-term responsibilities (e.g., land use controls) are accepted by the new entity. This definition of completion is based on our current planning efforts and knowledge of DOE's post-cleanup obligations. The definition is subject to change as further experience is gained at Hanford regarding LTS, as lessons from similar activities at other DOE sites and federal agencies are applied, and as related policy decisions are made by DOE Headquarters.

The following process may be used to determine when LTS for a particular parcel of land at the Hanford Site is considered to be complete:

1. Performance metrics will be developed to define when LTS is complete. These metrics may include the achievement of all remedial action objectives and cleanup goals and the completion of all required long-term cleanup operations and maintenance activities. The performance metrics will be based on regulatory requirements (see Action No. 1 in Chapter 3).

2. The achievement of the performance metrics will be demonstrated and documented. The future DOE LTS program will collect and evaluate the data that are required to demonstrate achievement of the performance metrics.

3. DOE will follow all applicable regulatory requirements regarding the cessation of operation and maintenance activities and the termination of institutional controls.

DOE's LTS activities also may be considered complete when the ownership or administration of the land is transferred to another entity (federal, state, or private entity). If such a transfer occurs, DOE retains liability as the potential responsible party.[12] DOE will take the requisite steps to ensure controls are in place in accordance with the applicable regulatory requirements and that the controls are transferred using the appropriate mechanism (see Action No. 15 in

[12] "Section 3158 of the National Defense Authorization Act of 1998 authorizes the Secretary of Energy to hold harmless and indemnify a person or entity to whom property is transferred against any claim for injury to person or property that results from the release or threatened release of a hazardous substance or pollutant or contaminant as a result of DOE activities at the defense nuclear facility on which the real property is located. This indemnification does not apply to the extent that the persons and entities contributed to any such release or threatened release. (42 USC. 7274q(b); 10 CFR 770)." (Source: *Long-Term Stewardship Study (Final Study)* [EM 2001]).

Chapter 3).[13] DOE is committed to maintaining the protection of human health and the environment and to meeting its long-term, post-cleanup obligations.

[13] Further information regarding the use of controls when land is transferred to another entity is provided in the *Sitewide Institutional Controls Plan For Hanford CERCLA Response Actions* (DOE/RL-2001-41).

5.0 REFERENCES

10 CFR 20, 1992, "Standards for Protection Against Radiation," *Code of Federal Regulations*, as amended.

10 CFR 770, "Transfer of Real Property at Defense Nuclear Facilities for Economic Development," *Code of Federal Regulations*, as amended.

36 CFR 1228, "Disposition of Federal Records," *Code of Federal Regulations*, as amended.

40 CFR 265, 1992, "Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities," *Code of Federal Regulations*, as amended.

40 CFR 300, 1992, "National Oil and Hazardous Substances Pollution Contingency Plan," *Code of Federal Regulations*, as amended.

40 CFR 430, 2002, "CERCLA National Contingency Plan," *Code of Federal Regulations*, as amended.

61 FR 19448, 1996, "Institutional Controls in RCRA and CERCLA Response Actions," *Federal Register*, Vol. 61, p 19448.

61 FR 26771, 1996, "Sacred Sites Executive Order 13007," *Federal Register*, Vol. 61, p. 26771 (May 24).

64 FR 61615, 1999, "Hanford Comprehensive Land-Use Plan Environmental Impact Statement, Hanford Site, Richland, Washington; Record of Decision (ROD)," *Federal Register*, Vol. 64, No. 218, p. 61615 (November 12).

66 FR 56664, 2001, "Long-Term Stewardship Study (Final Study)," *Federal Register*, Vol. 66, No. 218, pp. 56664-56665 (November 9).

67 FR 40329, 2002, "Presidential Proclamation 7319," *Federal Register*, Vol. 67, No. 113, p. 40329 (June 9).

American Indian Religious Freedom Act of 1978, 42 USC 1996, et seq.

Archaeological Resources Protection Act of 1979, 16 USC 470aa, et seq.

Atomic Energy Act of 1954, 42 USC 2011, et seq.

Clean Air Act, 1955, as amended, 42 USC 7401, et seq.

Clean Water Act of 1977, 33 USC 1251, et seq.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 USC 9601, et seq.

Disposal of Records, 44 USC 33. et seq.

DOE, 2000, *U.S. Department of Energy American Indian & Alaska Native Tribal Government Policy*, U.S. Department of Energy, Office of Congressional & Intergovernmental Affairs, Washington, D.C.

DOE Order 450.1 *Environmental Protection Program*, U.S. Department of Energy, Washington, D.C.

DOE Organization Act of 1977, 42 USC 7112, et seq.

DOE/RL-2001-41, 2002, *Sitewide Institutional Controls Plan For Hanford CERCLA Response Actions*, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-2002-47, 2002, *Performance Management Plan for the Accelerated Cleanup of the Hanford Site (PMP)*, Revision D, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

EM, 2003, *Definition of EM Completion and DOE Site Closure* (Fact Sheet), U.S. Department of Energy, Office of Environmental Management, Corporate Projects Initiative, National FOCUS Project, Washington, D.C.

Ecology, EPA, and DOE, 1989, *Hanford Federal Facility Agreement and Consent Order*, as amended, Washington State Department of Ecology, U.S. Environmental Protection Agency, U.S. Department of Energy, Olympia, Washington.

Endangered Species Act of 1973, 16 USC 1531, et seq.

EPA 540-G-89-004, 1988, G*uidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (Interim Final)*, OSWER Directive 9355.3-01, U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Washington, D.C.

EPA 540-R-01-007, 2001, *Superfund Comprehensive Five-Year Review Guidance*, Office of Emergency and Remedial Response, OSWER No. 9355.7-03B-P, U.S. Environmental Protection Agency, Washington, D.C.

Federal Land Policy and Management Act of 1976, 43 USC 1701, et seq.

Federal Records Act of 1950, 44 USC 33, et. seq.

Freedom of Information Act, 5 USC 552, et seq.

GJO–2002–285–TAR, 2002, *Long-Term Surveillance and Maintenance Program 2001 Report*, U.S. Department of Energy, Grand Junction Office, Grand Junction, Colorado.

HNF-12254, 2002, *Hanford Long-Term Stewardship Program: Integrating Accelerated Site Cleanup Completion with Long-Range Post-Cleanup Planning*, Working Draft, Rev. A, Fluor Hanford, Inc., Richland, Washington.

Migratory Bird Treaty Act, 16 USC 703, et. seq.

Mining Law of 1872, 30 USC 22-54, et. seq.

National Defense Authorization Act for Fiscal Years 1992 and 1993, 42 USC 7274, et seq.

National Defense Authorization Act of 1998, 5 USC 7511, et seq.

National Environmental Policy Act of 1969, 42 USC 4321, et seq.

National Historic Preservation Act, 1966, 16 USC 470, et seq.

Native American Graves Protection and Repatriation Act of 1990, 25 USC 3008, et seq.

Resource Conservation and Recovery Act of 1976, 42 USC 6901, et seq.

Safe Drinking Water Act of 1974, 42 USC 300f, et seq.

The White House, 2000, *Hanford Reach National Monument Proclamation,* Office of the Press Secretary, Washington, D.C.

Wild and Scenic Rivers Act of 1968, 16 USC 1271-1287, et. seq.

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APPENDIX A

THE HANFORD SITE IN 2035

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APPENDIX A

THE HANFORD SITE IN 2035

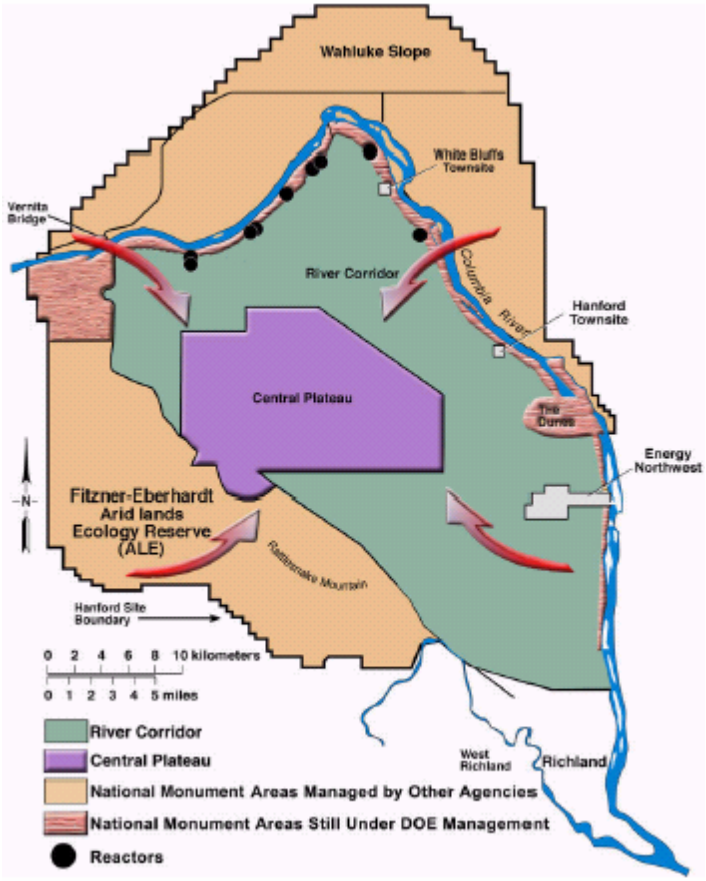
This appendix is an excerpt from Chapter 3 of the Performance Management Plan for the Accelerated Cleanup of the Hanford Site (PMP) (DOE/RL-2002-47, Rev. D).

What will it mean to have "cleaned up" the Hanford Site? What will the site look like and what will be left? What activities might remain? Who will benefit?

Successful Hanford cleanup will mean eliminating a major threat to human health and the environment. It will mean permanent protection of the groundwater and the Columbia River. It will mean freeing up large stretches of land – much of it along the Columbia River shoreline and part of the Hanford Reach National Monument – for conservation, Tribal, recreational and industrial uses. It will mean the end of DOE's EM cleanup mission at Hanford and a major taxpayer liability – currently around $2 billion per year.

The "shrinking" of active Hanford cleanup operations to the Central Plateau is depicted in Figure 2.

Figure 2. Shrinking the Hanford Site.



Envisioning this "end state" in 2035 – and hopefully sooner – we see about 85% of Hanford cleaned to unrestricted surface use standards, and the remaining core zone having gone through a closure process that is protective of human health and the environment. Specifically:

- The approximately 210 square miles (546 square kilometers) that make up the Columbia River Corridor will be cleaned to the levels in the approved Records of Decision by 2012. Nearly all waste sites will have been removed and backfilled. All excess buildings will have been removed and real property dispositioned. The first of Hanford's reactors could be a museum recognizing Hanford's scientific and engineering feats, and the remaining eight will be "cocooned" for safe storage until a final decision on their disposal is made. The 100 Area and the majority of the 300 Area in the River Corridor could be deleted from EPA's National Priorities List as described in EPA's 1995 Deletion Policy. Although there will be some continuing degree of engineering and institutional controls on the use of groundwater, the 100 Area land surface will be cleaned to a level suitable for residential use, and the 300 Area cleaned to a level suitable for industrial use. Some land will be included as part of the Hanford Reach National Monument.

  By the time all this work is complete in 2012, there will be limited DOE activities remaining in the River Corridor. Pending update of the Reactor Disposition EIS, the reactor cocoons will remain in place through 2035. (There are a small number of adjacent waste sites that will be addressed as part of the final reactor disposition.) Several facilities in the 300 Area will still be operating to service the ongoing cleanup mission and the Pacific Northwest National Laboratory. Cleanup of the 618-10 and 618-11 burial grounds, which contain very-high-radiation-level transuranic waste, will start following the design and development of retrieval treatment and technologies and will be complete by 2018. Remediation of the groundwater and springs is expected to continue past 2012.

  This plan does not discuss deactivation of the Fast Flux Test Facility (FFTF). Tri-Party Agreement negotiations to add FFTF to the Hanford cleanup program are under way. When we update this plan, it will reflect the result of those negotiations.

  We will have completed all activities necessary for transfer of nearly all of the Fitzner-Eberhardt Arid Lands Ecology Reserve (ALE), the Riverlands, and the Wahluke Slope to the U.S. Fish and Wildlife Service by 2005. The federal government will continue to protect cultural resources and carry out its trust responsibilities.

- In the Central Plateau, we will have packaged and shipped offsite all stored plutonium, high-level waste canisters, cesium and strontium capsules, and spent nuclear fuel. We will have shipped offsite all transuranic waste that requires retrieval. Low-activity tank waste will have been treated, immobilized and disposed. We will have completed waste retrieval and closure activities at the underground waste tanks, associated ancillary equipment and contaminated soils in accordance with TPA and other applicable regulatory requirements. The Waste Treatment Plant and all its support facilities will have been demolished or otherwise dispositioned. We will have dispositioned Hanford's five massive canyon facilities – either by filling them with acceptable waste and capping them, or demolishing them. The other waste sites will have been removed, capped, or otherwise dispositioned. We will have taken action to treat and protect groundwater resources. We will have

petitioned EPA to remove the Central Plateau's 200 Area from the National Priorities List and will have a long-term monitoring plan in place.

The Central Plateau's core zone (the 200 Areas including B Pond and S ponds) will have an "industrial use scenario" for the foreseeable future. Waste Sites outside the Core Zone but within the Central Plateau (200 N, Gable Mountain Pond, B/C Crib Controlled Area) will be remediated and closed based on an evaluation of multiple land use scenarios to optimize land use, institutional control cost, and long-term stewardship. The industrial use scenario will not be used to create a national "sacrifice zone." All sites will be in full compliance with cleanup requirements and will be fully protective of human health and the environment.

- Post-2035, we could expect some level of ongoing activity in the Central Plateau – including commercial waste operations (U.S. Ecology's disposal site is leased through 2064), the Navy's disposal of decommissioned naval reactor compartments, stewardship, and perhaps ongoing DOE waste disposal operations. There would also be regulatory, engineering and institutional controls in place and continuation of ongoing groundwater monitoring. There will be a federal responsibility at Hanford for generations to come, but DOE's EM cleanup work would be complete.

In developing the initiatives described in this plan, we (along with our regulators) have had to tackle Hanford's myriad of cleanup issues in a manner that does not compromise the cleanup itself, and, at the same time, enables us to greatly accelerate cleanup schedules and achieve major lifecycle cost savings. The fact that we are open about wanting to reduce the taxpayer's long-term investment in Hanford cleanup has raised the concern that meeting this objective will require decreasing the quality of the work we do.

Neither our regulators nor we want or intend that. Don't mistake our commitment to cost and schedule savings for evidence that the federal government is any less committed to Hanford cleanup. In fact, it is because we want both high-quality cleanup and to reduce the long-term taxpayer liability that we have had to "break the mold" and find new ways to get the job done well. Under this plan, by 2035 we will have completed a cleanup that is both comprehensive and high quality. Each phase of the cleanup will have been accomplished in a manner fully compliant with all requirements and cleanup standards.

In particular, we want to underscore our commitment to give protection of the Hanford groundwater the priority it deserves. To that end, we have created a strategic initiative that will help drive a new and comprehensive site-wide groundwater remediation program that will focus both on the cleanup of contaminants that have reached or may reach Hanford aquifers, as well as all aspects of Hanford Site work that affect vadose zone contamination and groundwater protection.

By ensuring our compliance with the Tri-Party Agreement and focusing on risk reduction and real physical progress, we can achieve by 2035 a high-quality and comprehensive cleanup that is fully protective of the environment, and of which the federal government, state, Tribes, and citizens of the Pacific Northwest can truly be proud.

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