WORKING DRAFT

Hanford Long-Term Stewardship Program:
Integrating Accelerated Site Cleanup Completion with Long-Range Post-cleanup Planning

Based on Input from

The Regulator/Stakeholder/Tribes Long-Term Stewardship Workshops #1 and #2,

The DOE-Richland Subject Matter Expert Mini-Workshop on Long-Term Stewardship,

and

The DOE-Headquarters Long-Term Stewardship Plan Guidance (Draft) and Reports

September 2002

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PREFACE

This draft document presents a description of the Long-term Stewardship Program, including its vision, mission, goals, and functions. The framework for the *Hanford Long-Term Stewardship Program: Integrating Accelerated Site Cleanup Completion with Long-Range Post-cleanup Planning* was developed through a series of workshops designed to provide an opportunity for the Tribal Nations, stakeholders, and others to influence the development of this document. The workshops solicited input regarding the participants' ideas and understanding of what long-term stewardship is, their future vision of the Site once cleanup is completed, and their values for long-term stewardship planning. DOE is now soliciting a broader range of consultation and review on this working draft document and will review and disposition the comments prior to issuing a final document.

As you review this working draft, give us your feedback on whether we have identified the appropriate elements and approaches to long-term stewardship at the Hanford Site (Hanford). Are there areas of emphasis that should be added or deleted? Please recognize that it will be at least twenty (20) years until cleanup is complete at Hanford, because all of the final decisions and details are not known today.

After this document is finalized, DOE will develop a phased implementation plan for long-term stewardship at Hanford. This document and its implementation plan will define the activities and schedule necessary for Hanford to transition into long-term stewardship at the completion of cleanup, currently scheduled to be 2035 (or possibly sooner). As cleanup is completed, this document will be used as the basis for scoping of contracting requirements for long-term stewardship.

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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 and transfers major portions of the Site out of its administrative control, long-term stewardship (LTS) at the Hanford Site (Hanford) will become a significant responsibility. The Hanford LTS Program covers the entire Site, including the activities of the DOE Richland Operations Office and the DOE Office of River Protection. It is important at this time for DOE to define and implement the program that will enable it to prepare for and meet (or transfer, as appropriate) its post-cleanup obligations.

What are these obligations? While the surface footprint of the active Site will shrink, some residual contamination will remain below soil covers, a number of waste disposal sites will be covered by engineered "caps," 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. DOE also will be required to prevent excavation of contaminated soil and covered disposal areas, as well as use of the contaminated groundwater. These requirements are just a few of the obligations that the Long-term Stewardship Program addresses to protect human health and the environment as portions of the Site become available for alternate uses.

At the conclusion of the cleanup program, residual hazards will remain, both on the surface and subsurface (see Appendix A). As DOE and the regulatory agencies pursue options to accelerate cleanup completion, the development of this LTS program is critical to ensure that the program is in place to manage areas where cleanup has been completed and residual materials remain, no matter the completion date.

Long-term stewardship activities actually began when the Site was first used to support national defense in 1943. Only a small portion of the Site was used for actual production purposes and the remainder was managed as a buffer zone, which provided protection for the cultural, biological, and natural resources located within the boundaries of the Site. Over the years, the DOE and its predecessor agencies have developed various activities to protect these unique resources, which now fall under the umbrella of long-term stewardship. Today, DOE has

programs and activities in place for stewardship of Hanford resources. These current programs are not the focus of this document.

The Hanford Site has taken a holistic, multi-generational, and integrated approach to long-term stewardship. At Hanford the term "long-term stewardship" consists of three elements: management of residual risk, management of Site resources, and reuse. The first element is the management of the risks (human health, ecological, and cultural) associated with any remaining residual contamination. Restoration of contaminated areas to their pre-Hanford condition is often not feasible because of the associated worker and environmental risks, costs, and technical and logistical issues. The second element is the protection of the Site's cultural, biological, and natural resources. Many of these resources have been set aside and protected for nearly 60 years, providing a vital link in the preservation of the biodiversity of the Columbia Basin's ecoregion. The third element is the reuse of the Site's assets as land, facilities, technologies, and skilled personnel are no longer required to support Hanford Site missions.

The *Hanford Long-Term Stewardship Program: Integrating Accelerated Site Cleanup Completion with Long-Range Post-cleanup Planning* (LTS Program) establishes the framework, from strategic direction through implementation, for a successful program (see Figure ES-1). The LTS Program was built from the mission level, down to the implementation level, with input from stakeholders and regulatory agencies. The LTS Program is to be used as an internal DOE management tool. The strategies and actions presented in this document do not impose any additional legal obligations. The LTS Program is also a "living" document that will be updated on a periodic basis to reflect the evolving issues related to both cleanup end states and long-term stewardship transition.

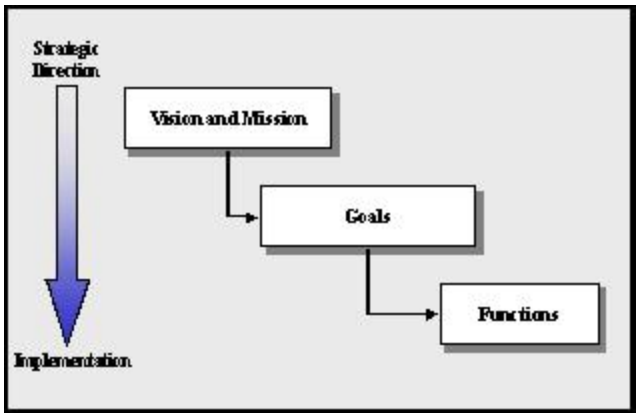

Figure ES-1.
Long-Term Stewardship Program.

Beginning with the end in mind, the LTS Program is built on a vision that describes a broadly agreed upon picture so the reader may understand and believe in a valued, mutual

destination. The long-term stewardship 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: The mission of the LTS Program is to provide for continuous human and environmental protection, and the conservation and consideration of use of the biological, natural, and cultural resources, both during and following the completion of the cleanup mission. The goals of the LTS program incorporate input provided during a series of public workshops regarding long-term stewardship.

The values developed at the strategic level, the vision, mission, and goals, are integrated into the six LTS functions (see Figure ES-2). Proposed candidate actions to implement each function, suggested to DOE by various organizations that participated in long-term stewardship workshops, are presented along with their associated proposed performance measures. Also presented is the overall management approach for long-term stewardship.

The LTS Program presents Hanford's first document developed to integrate Site cleanup completion requirements with DOE's post-cleanup obligations. This draft was developed based on input provided during DOE sponsored workshops attended by members of the Tribal Nations, Hanford Advisory Board, the Environmental Protection Agency, the Washington State Department of Ecology, and other interested parties. The LTS Program will serve as a basis for building long-term stewardship activities into the Site baseline. This document also serves as a vehicle for consultation with Tribal Nations, and dialogue with stakeholders and the public regarding long-term stewardship. The framework presented in the LTS Program will be used to impact long-term risk management, resource protection, reuse decisions as well as protecting the Site's legacy for future generations as accelerated cleanup is completed.

Figure ES-2. Long-Term Stewardship Functions.

- **Manage Post-cleanup Completion Residual Risks** - DOE uses a layering strategy of mutually reinforcing controls, including engineered barriers, physical controls, administrative controls, and environmental monitoring to manage and mitigate the risks associated with residual contamination. The *Sitewide Institutional Controls Plan for Hanford CERCLA Response Actions*[a] describes the implementation and maintenance of institutional controls for the Hanford Site in accordance with the *Comprehensive Environmental Response, Compensation and Liability Act of 1980*[b] decision documents.

- **Manage Site Resources** - DOE integrates the management of the biological, natural, and cultural resources of the Hanford Site under DOE administration to guard and to share the resources for current and future generations.

- **Manage Stewardship Information** - DOE manages stewardship cleanup information so that current and future generations are able to access the information necessary to support stewardship of the Site.

- **Use Science and Technology** - DOE uses scientific knowledge and technological innovation to achieve long-term stewardship goals.

- **Provide Post-cleanup Completion Infrastructure** - DOE identifies, supplies, and maintains the amount of infrastructure (facilities, services, and utilities) required to support long-term stewardship and any remaining, ongoing missions at the Hanford Site.

- **Integrate Long-term Stewardship Responsibilities** - DOE integrates long-term stewardship responsibilities, supporting decision making to ensure consistency, and provide opportunities to gain efficiencies, which may result in lower life-cycle costs.

[a]DOE/RL-2001-41, 2002, *Sitewide Institutional Controls Plan for Hanford CERCLA Response Actions*, Rev. 0, Fluor Hanford, Richland, Washington.

[b]*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*, 42 USC 601 et seq.

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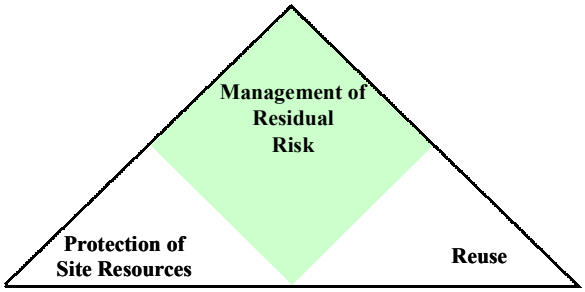
TERMS

AEA	*Atomic Energy Act of 1954*
CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
CFR	Code of Federal Regulations
CLUP	Comprehensive Land-Use Plan
DOE	U.S. Department of Energy
Ecology	Washington State Department of Ecology
EM	Environmental Management
EPA	Environmental Protection Agency
LTS	long-term stewardship
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
PMP	Performance Management Plan
RCRA	*Resource Conservation and Recovery Act of 1976*
RIMS	RL Integrated Management System
RL	U.S. Department of Energy, Richland Operations Office
ROD	record of decision
SMB	Site Management Board
Tri-Party Agreement	*Hanford Federal Facility Agreement and Consent Order*
USF&WS	U.S. Fish and Wildlife Service

1.0 INTRODUCTION

Long-term stewardship (LTS) at the Hanford Site (Hanford) is comprised of three elements, the management of risks (human health, ecological, and cultural) associated with any remaining residual contamination; the protection of the Site's cultural, biological, and natural resources; and the reuse of the Site's assets (see Figure 1-1). The outcome of long-term stewardship at Hanford looks beyond the completion of cleanup and serves as a guide for the future of the Site.

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



Definition of Long-term Stewardship

The first element of long-term stewardship protects human health and the environment from the risks associated with the residual contamination remaining after the completion of the cleanup mission. Restoring some contaminated areas to their original conditions often is not feasible. The risks and the costs involved in the remediation, along with technical and logistical problems, may make it impracticable to restore the sites to their original conditions. The initial challenge of this element is providing the requisite level of protection for portions of the Site where the cleanup mission has been completed and these portions transferred (or ready to be transitioned) from the U.S. Department of Energy (DOE) control while the remediation of adjacent areas may be ongoing. The Environmental Management (EM) program is responsible for protection from the residual risks during active cleanup, but once complete, the LTS program must provide this protection.

"No trespassing" and warning signs

The second element includes consideration of the unique biological, natural, and cultural resources as DOE conducts and completes cleanup at the Site and authorizes appropriate new uses. These resources include fish, wildlife, and plant populations and their habitats; minerals, natural gas, surface water, groundwater, land, and other natural resources; prehistoric archaeological sites; Native American sacred and ceremonial places; and historical resources. Successful long-term stewardship will provide protection and make

Hanford Reach National Monument

available these resources through integrated management and enable current and future generations to enjoy the rich vitality of the resources of the Site.

The third element includes ensuring the redeployment of Site assets to encourage productive use. Site assets, including facilities, technologies, skilled personnel, and land that can be reused to stimulate economic growth and help to provide much-needed jobs in the long-term as the DOE cleanup mission is completed. DOE anticipates multiple future uses for Hanford, including other DOE missions, non-DOE federal missions, and other public and private sector uses.

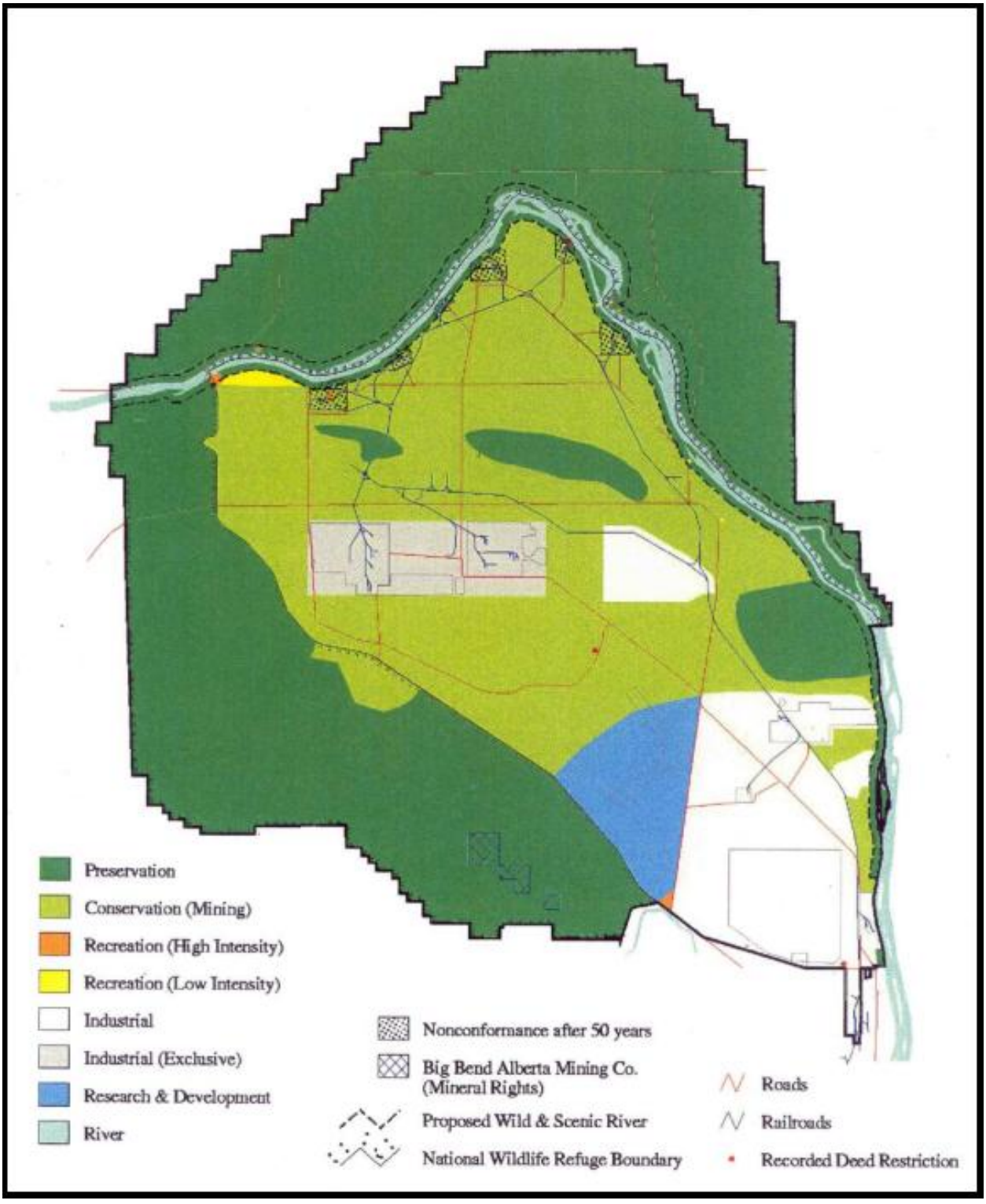
Energy Northwest Columbia Generating Station

The DOE/EIS-0222-F, *Final Record of Decision Hanford Comprehensive Land Use Plan Environmental Impact Statement* (released in November 1999) provides the comprehensive land-use plan (CLUP) for a 50-year time line (see Figure 1-2). The CLUP Record of Decision (ROD) provides a framework for making land use and facility use decisions while DOE manages the land and includes a multiple-use theme of industrial, research and development, recreation, conservation (mining), and preservation land uses. The largest area of Hanford will have conservation of ecological and cultural resources emphasized. It will be managed by the U.S. Fish and Wildlife Service as the Hanford Reach National Monument. DOE is working with U.S. Fish and Wildlife Service, area Tribal Nations, and stakeholders to make land-use decisions within the Hanford Reach National Monument and other lands.

The *Performance Management Plan for the Accelerated Cleanup of the Hanford Site (PMP)* (DOE/RL-2002-47) describes DOE strategic initiatives to accelerate cleanup, reduce risk and put Hanford on a path to complete closure by the year 2035. These initiatives include the following:

- Restoring the Columbia River Corridor by the year 2012 to reduce risk to the river and shrink Hanford operations
- Completing the tank waste program by the year 2033
- Accelerating the cleanup of Hanford's other urgent risks by removing from the river's edge K-Basins spent nuclear fuel, sludge, debris and water 10 months early
- Stabilizing and securely storing remaining plutonium nine years sooner
- Demolishing the Plutonium Finishing Plant seven years earlier
- Accelerating treatment and disposal of mixed low-level waste and retrieval and shipment of transuranic waste offsite 5 to 10 years ahead of current plans

Figure 1-2. U.S. Department of Energy's Preferred Alternative.



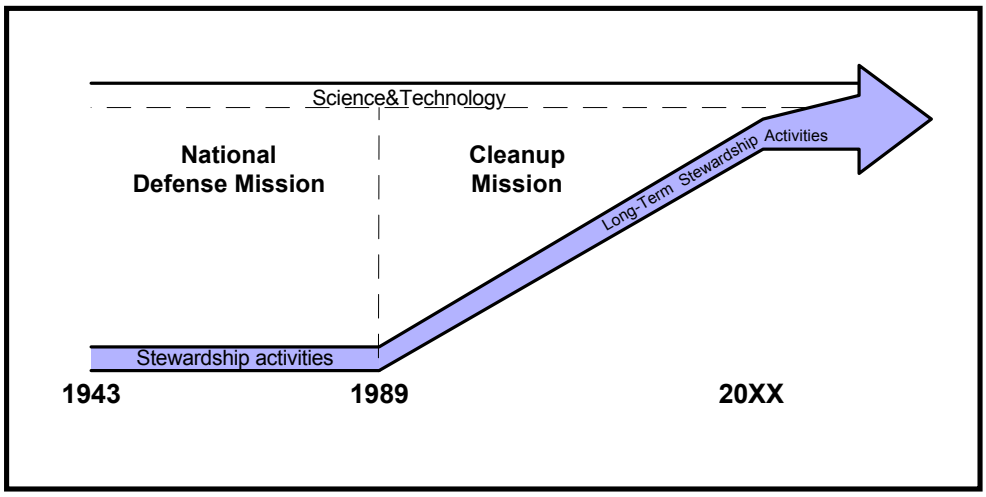
Source: DOE/EIS-0222-F, 1999, *Final Hanford Comprehensive Land Use Plan Environmental Impact Statement Record of Decision*, U.S. Department of Energy, Washington, D.C.

- Cleaning up the Central Plateau's over 900 excess facilities and more than 800 non-tank-farm waste sites nearly 14 years early

- Protecting groundwater resources by removing or isolating important contaminant sources, dramatically reducing the conditions that have the potential to drive contaminants into the groundwater, treating the groundwater, and integrating all site monitoring requirements.

Although the use of the term "long-term stewardship" is relatively new, long-term stewardship activities began when the Site was first used to support national defense in 1943. Only a small portion of the Site has been used for actual production purposes to support the national defense mission. The remainder of the Site was managed as a buffer zone, which helped to protect the cultural, biological, and natural resources. As cleanup is completed, long-term stewardship will become a major focus of Site environmental activities (see Figure 1-3).

Figure 1-3. Long-Term Stewardship Continues a Tradition of Stewardship.

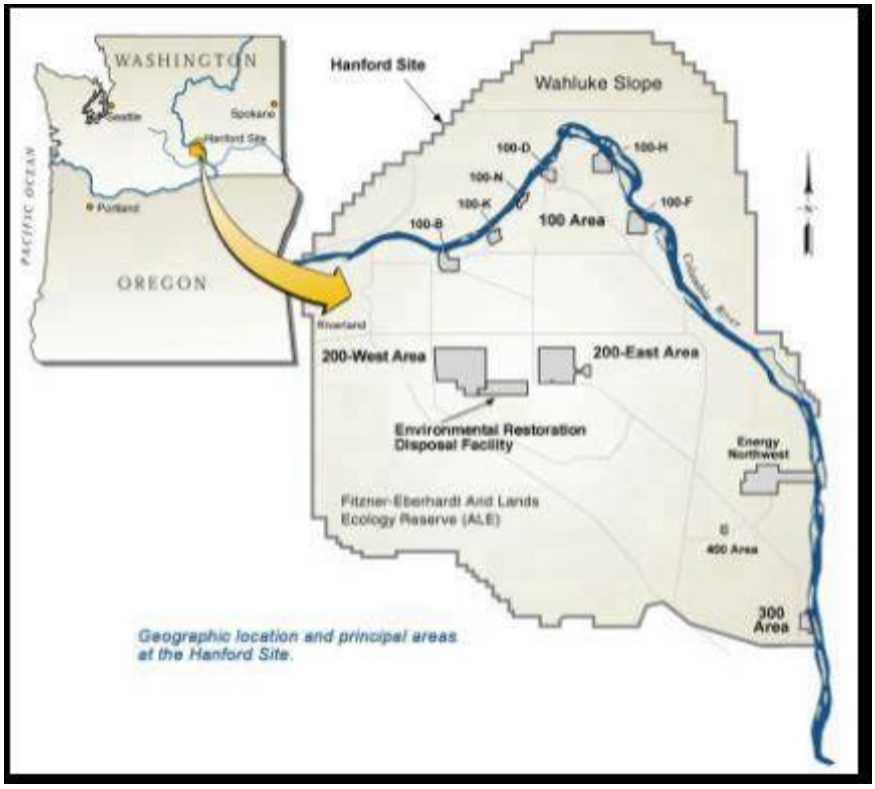


Various programs are currently performing many of the long-term stewardship activities. The LTS Program integrates these activities into a single program to ensure consistency across the Site, to increase efficiencies, decrease life-cycle costs, and to support decision-making that considers multiple priorities. This document consolidates post-cleanup obligations to help assist in the evaluation of the accelerated cleanup options and to successfully complete the transition of the land from EM cleanup to ownership by the next steward.

1.1 BACKGROUND

The Hanford Site in southeastern Washington State is 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 1-4).

Figure 1-4. Location of the Hanford Site.



The Hanford Site was acquired 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 1970s and 1980s, DOE ended the production of nuclear materials for weapons at the Site.

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) (also known as the Tri-Party Agreement), with the 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 DOE EM Program include a reduction in the size of the active EM footprint and a reduction in the cost and time required to complete the EM cleanup mission. As cleanup is accelerated, long-term stewardship must be factored into the cleanup process so that the acceptance criteria at the end of cleanup is known and planned for adequately.

Portions of the Site have already been cleaned up, removed from the NPL and released for other uses. The expected completion cleanup timeline for the remainder of the Site is the year 2035, or earlier, as described in the PMP.

The current assumptions for end state of the Site following the completion of cleanup, based on the cleanup milestones in the Tri-Party Agreement, RODs, the Hanford Site baseline, and the PMP, are summarized in Table 1-1 and described in further detail in Appendix A. Portions of land will be transferred out of DOE control as it becomes excess to the DOE mission. There will be some continuing degree of engineering and institutional controls on the Hanford Site following the completion of cleanup, including restrictions on the use of groundwater, groundwater monitoring activities and protected and controlled access to the Central Plateau area. As a result, some portions of the Site may be turned over from the EM program to another federal owner for post-cleanup maintenance and monitoring activities.

Table 1-1. Post-Cleanup Completion.

Area	Post-cleanup			Availability for Non-DOE Uses
	Operations	Engineered Barriers	Institutional Controls	
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.	Yes	Yes	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. There will be continued engineering and institutional controls on the use of groundwater.[a]
Central Plateau	Commercial waste operations (U.S. Ecology's disposal site is leased through the year 2064), the 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.	Yes	Yes	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. There would also be regulatory, engineering and institutional controls in place and continuation of ongoing groundwater monitoring.

[a]Tri-Party Agreement negotiations regarding the addition of the deactivation of the Fast Flux Test Facility (FFTF) to the Hanford cleanup program are under way. When we update this plan, it will reflect the result of those negotiations.

Source: DOE/RL-2002-47, 2002, *Performance Management Plan for the Accelerated Cleanup of the Hanford Site (PMP)*, U.S. Department of Energy, Richland Operations Office. Appendix A presents further details regarding the potential end state.

1.2 WHY IS LONG-TERM STEWARDSHIP IMPORTANT?

Because the completion of the cleanup mission at Hanford will not result in the complete elimination of all residual contamination (either radiological and/or hazardous), long-term stewardship activities will be required for portions of the Site to ensure protection of human health and the environment. Restoration of contaminated areas to their original conditions (prior to Hanford use) is often not feasible because of the associated worker and environmental risks, costs, and technical and logistical issues. At the conclusion of the cleanup program, residual hazardous contamination will remain, both on the surface and subsurface (see Appendix A).

The length of time over which long-term stewardship activities will be required is not measured in terms of years, or even decades, but rather in terms of hundreds, and in some cases, even thousands, of years. Among the hazards remaining are plutonium, cesium, strontium, and tritium. With half-lives for some of these contaminants ranging from a few years to over 20,000 years (see Table 1-2), long-term stewardship will be required on portions of the Site long after cleanup is complete to protect human health and the environment.

Table 1-2. Radionuclide Half-Lives.[a]

cesium-137	30 years	strontium-90	29.1 years
iodine-129	16,000,000 years	technetium-99	210,000 years
plutonium-238	87.7 years	tritium	12.4 years
plutonium-239	24,000 years	uranium-238	4,500,000,000 years

[a]Half-life is the time it takes for one-half of any given number of unstable atoms to decay.

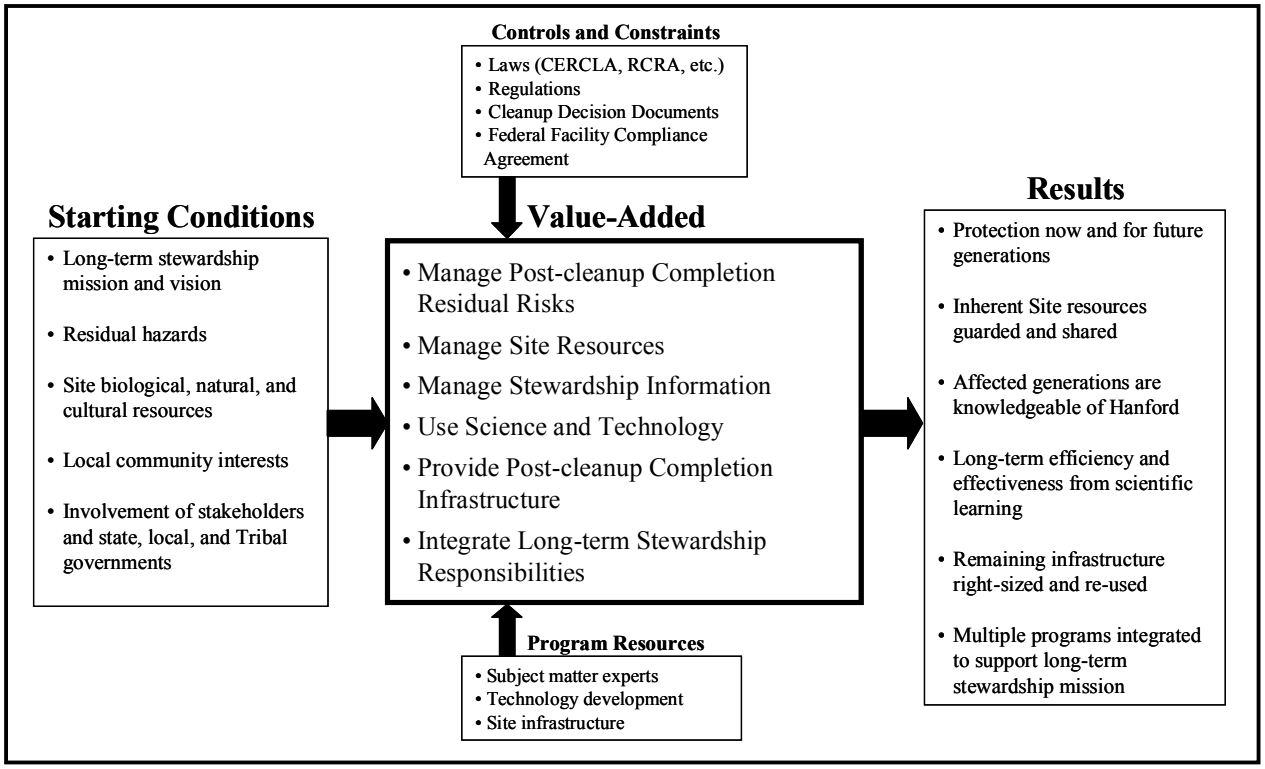
Source: *2000 Annual Environmental Report*.

This is a pivotal time in the existence of the Hanford Site. Fundamental decisions regarding cleanup are being made today that will define the future landscape of the Site, including the nature and characteristics of the residual hazards, as well as the timing of the availability of land that will be excess to the DOE mission. It is important for DOE to define and implement a program at this time that will enable DOE to prepare for and meet its post-cleanup obligations.

1.3 PURPOSE OF THE LONG-TERM STEWARDSHIP PROGRAM

The *Hanford Long-Term Stewardship Program: Integrating Accelerated Site Cleanup with Long-Range Post-cleanup Planning* (LTS Program) presents the first approach developed to integrate the various Site closure requirements with the long-term (post-cleanup) obligations (see Figure 1-5). The Hanford LTS Program covers the entire Site, including the activities of the RL and the DOE Office of River Protection. The LTS Program is to be used as an internal DOE management tool as DOE accelerates cleanup and transfers major portions of the Site out of its administrative control.

Figure 1-5. Long-Term Stewardship Program Integrates Post-cleanup Obligations.



The LTS Program provides a framework for identifying the key requirements for completing Site cleanup with a transition to post-cleanup completion activities. It supports consultation with Tribal Nations and dialogue with stakeholders and the public, and it will serve as a basis for building long-term stewardship activities into the Site baseline. This draft was developed based on input from DOE and regulatory agencies, Tribal Nations, Hanford Advisory Board workshops, and the products of other national stakeholder workshops on this subject.

The LTS Program is a "living" document that will be updated on a periodic basis to reflect the evolving issues related to both cleanup end states and long-term stewardship transition. The LTS Program is to be used as an internal DOE management tool. The strategies and actions presented in this document do not impose any additional legal obligations. The LTS Program will track and monitor the progress of long-term stewardship in the DOE complex to assess applicability to the Hanford Site.

2.0 LONG-TERM STEWARDSHIP PROGRAM

This chapter describes the program at the Hanford Site that is dedicated to long-term stewardship and its vision, mission, and goals. This chapter also describes the key functions of the LTS Program.

2.1 LONG-TERM STEWARDSHIP VISION, MISSION, AND GOALS

Beginning with the end in mind, the LTS Program is built on a vision with broad agreement that describes a valued destination. The long-term stewardship vision at the Hanford Site is:

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

The Site functions needed to achieve the long-term stewardship vision are the central elements of the LTS Program. The LTS Program's purpose and functions are defined in the LTS Program mission statement:

> *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, both during and 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 now, and in the future, from the risks associated with the residual contamination.***

The intention of this goal is to ensure the effective management of the controls and systems that are designed to provide protection from residual contamination and migration of residual contamination. The requirements of managing residual risk shall be included in the protection and use of Site resources when making long-term stewardship decisions. Long-term stewardship environmental monitoring programs will be integrated, ensure protection, and provide advance warning of potential adverse groundwater impacts. The results of this goal

Groundwater monitoring well along river

is that future generations, human and otherwise, are protected from remaining radiological and chemical risks, and potentially affected parties have confidence in the effectiveness of the controls.

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

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. We will provide access to current and future generations to the Hanford heritage for their inspiration, enjoyment and, where feasible, employment. The access will be accorded such that we will protect important cultural resources and will sustain the habitat critical to the survival of vulnerable plant and animal species on DOE-managed lands and waters. Site resources will be protected and preserved as an integral part of a healthy regional ecosystem. We will encourage the productive reuse of resources of the Site in a manner that is protective of the resources. The land and assets of the existing Site, or its future "footprint," will be used or reused in a manner that honors and considers the sometimes competing values of external parties. We will cooperate with the U.S. Fish and Wildlife Service (USF&WS) as they manage the resources under their control on the Site. Land use decisions shall be made based on the CLUP ROD. The requirements of managing residual risk will be included in the protection and use of Site resources when making long-term stewardship 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 long-term stewardship for as long as it is necessary to support the protection of human health and the environment from 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. We will establish the systems to ensure that 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 long-term stewardship. Working with our Tri-Party signatories, we will seek to apply better stewardship solutions when the long-term benefit warrants post-cleanup completion expenditures. Long-term stewardship strategies 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, more-protective 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 Hanford missions that is cost-effective and efficient.***

Road Maintenance

The intention of this goal is for DOE to maintain and supply the infrastructure required to support the activities of long-term stewardship and ongoing Hanford missions. The LTS Program will help in the strategic planning process for ensuring the necessary and sufficient infrastructure is available to support long-term stewardship. 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 long-term stewardship and ongoing missions.

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

The intention of this goal is to incorporate the Long-term Stewardship Program concepts into the management systems of the existing and future Site stewards. DOE will operate the LTS Program so as to minimize the burden on future generations, either in quality of life, undue risk of exposure, or undue financial liability. DOE will work to integrate long-term stewardship concepts into the cleanup decision-making process to ensure consistency and provide opportunities to gain efficiencies. Pursuing this goal may result in lower life-cycle costs. Long-term stewardship planning will consider the short-term, intermediate, and long-term time

horizons, with an emphasis on life-cycle costs. The Long-term Stewardship Program will be designed to achieve operational consistency in quality across the Site. An objective of this goal is to support the transition of the Site from the cleanup mission, with EM as the Site manager, to its post-cleanup site manager, which is yet to be determined. To ensure a long-term and holistic perspective, a part of this goal will be to conduct Tribal consultation, and have involvement with stakeholder and affected parties. The results of this goal are well-defined contracting specifications, effective external advisory processes, direct application of other Sites experience, a more proactive interface with cleanup decisions, and a smooth transition from the EM Cleanup Mission to the Long-term Stewardship Program.

2.2 LONG-TERM STEWARDSHIP FUNCTIONS

How DOE intends to accomplish the goal for each of the functions is discussed in the following sections. Each section includes a brief description of the implementation strategy to accomplish the goal and a description of the function and its current conditions. Each section concludes with a list of candidate implementation actions suggested to DOE by participants of the long-term stewardship workshops to meet the goal. Suggested performance measures are listed to measure the success in achieving the goal.

2.2.1 Manage Post-Cleanup Completion Residual Risks

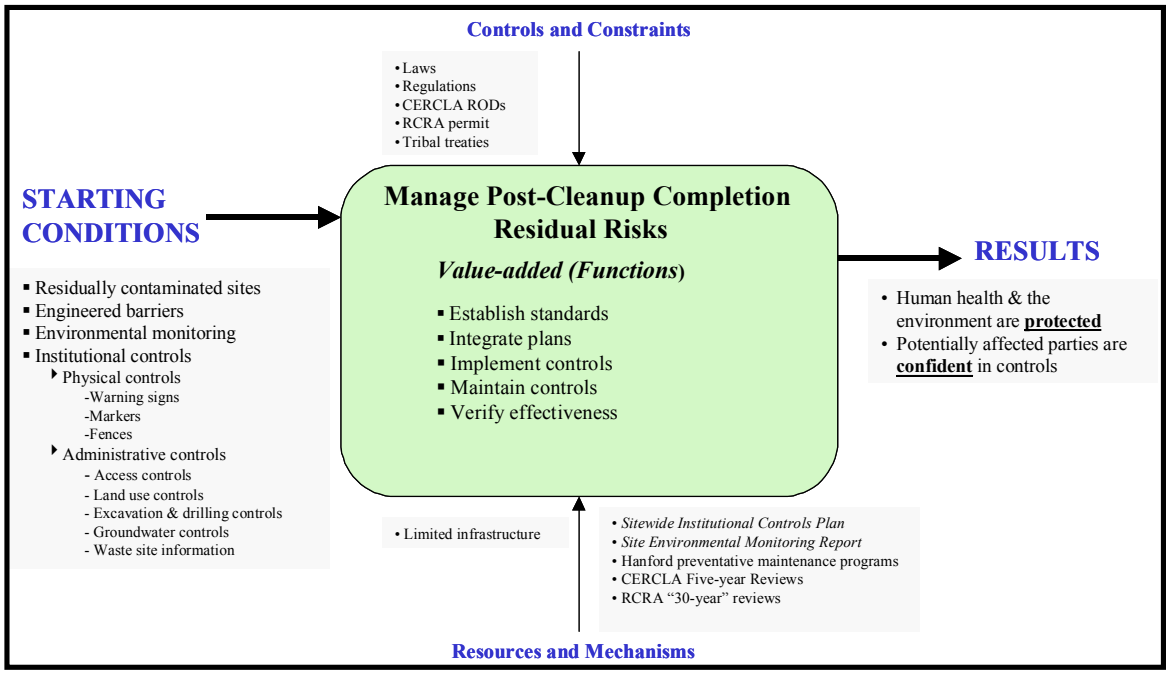
2.2.1.1 Implementation Strategy

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

The effective management of the controls to protect human health and the environment, including the biological, natural, and cultural resources, from residual contamination and migration of the residual contamination is one of the key strategies to achieve the mission and vision of long-term stewardship. The successful performance of this strategy will ensure that all controls perform as expected (see Figure 2-1).

Applicable requirements regarding the implementation of institutional controls shall be implemented in a rigorous, systematic manner, ensuring consistency across the Site; integrated into program and cleanup decisions; and consider the long-term dynamics of the entire Site and it's surrounding communities. At the completion of the cleanup mission, engineered barriers, institutional controls, and environmental monitoring systems will be in place, as required, by the corresponding decision documents; future organizations that own or administer land that is formerly part of the Hanford Site will maintain the controls for the land; and state and local governments maintain and enforce the institutional controls that may be under their jurisdiction.

Figure 2-1. Implementation Strategy to Manage Post-Cleanup Completion Residual Risks.



2.2.1.2 Current Conditions

DOE uses a layering strategy of mutually reinforcing controls to protect human health and the environment from the hazards associated with residual contamination.

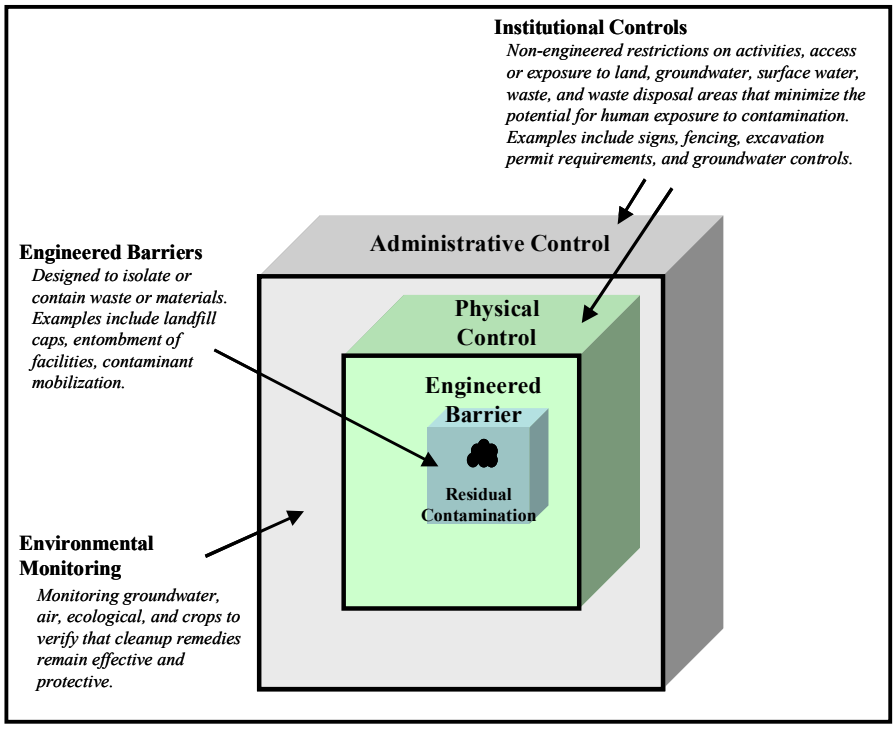
- Engineered barriers are man-made controls (e.g. caps, entombment of facilities, contaminant immobilization) designed to isolate or to contain waste or materials.

- 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.

- Environmental monitoring includes groundwater, air, crops, plants, and animals to verify that cleanup remedies remain effective and protective.

- 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 residual contamination. Physical and administrative controls are commonly referred to collectively as "institutional controls" (see Figure 2-2).

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



Institutional controls (administrative and physical controls) generally include all 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 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 physical remedy during and after cleanup (if residual hazards remain) 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.

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

The requirements for engineered barriers and institutional controls are found in the cleanup decision documents at Hanford. Cleanup decision documents (e.g., CERCLA Records of Decision) stipulate the selected cleanup remedy or the closeout process once cleanup is completed for a particular site, which may include the implementation of engineered barriers and institutional controls. The requirements for institutional controls under CERCLA response actions are listed in DOE/RL-2001-41, along with a description of their implementation and maintenance. Other regulations, in particular, the *Resource Conservation and Recovery Act of 1976* (RCRA) and Nuclear Regulatory Commission 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 hazards.[1] 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.

Surveillance, Maintenance, and Monitoring Activities

Surveillance, maintenance, and monitoring activities are conducted to ensure the effectiveness of institutional controls and engineered barriers over time. Surveillance and maintenance activities ensure the controls are maintained in good condition and working as intended. Some controls, such as surface covers and landfill caps, have finite design lives, and although these controls may be expected to fail at some point in time, their effective design life can be extended with long-term surveillance and routine maintenance activities.

Surveillance involves the physical inspection of the controls and an assessment of whether the controls remain effective in meeting their design objectives (e.g., evaluate whether fences are working to effectively control access). Surveillance is currently performed by DOE contractors. Controls are maintained through regularly scheduled maintenance activities, as well as repairs that are made as a result of surveillance.

Example of a Cap and its Associated Surveillance
(photo provided by another DOE site)

Monitoring activities are used to evaluate whether the controls are meeting their current design objectives and whether the design objectives remain adequate in protecting human health and the environment from the residual contamination. Monitoring activities also help to identify changing conditions at an early stage, before the protectiveness of the controls are compromised. Monitoring activities include the monitoring of the migration of contaminants in the different media (e.g., groundwater, surface water, air), including any migration that was not previously anticipated during the remedy selection process. For example, data from the groundwater monitoring program will be reviewed to ensure that the institutional controls currently in place for areas (such as the 300 NPL) are sufficient and that no additional measures are needed.

Monitoring across the Site is performed by various organizations and the results are documented on an annual basis in the Site Environmental Monitoring Report. The results of the monitoring activities are used to design and implement corrective measures to protect human health and the environment from changing conditions, if needed. The results may also be used to demonstrate that the desired performance of an environmental restoration project has been achieved, the response objective has been met, and that associated activities (e.g., pump and treat systems) can be terminated.

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

Emergency Response Activities

Emergency response activities at the Site are in place to enable DOE to respond to various types of emergencies, such as fires, floods, and other similar events. 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.

Land Transfer

Once the cleanup objectives have been completed and required cleanup levels achieved for a particular piece of property, the 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. If cleanup has not been completed to an unrestricted-use standard, institutional controls may be required for the transferred land. 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.

The institutional controls that will remain in place upon transfer of the land 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 DOE/RL-2001-41.

2.2.1.3 Suggested Candidate Actions

Participants of the long-term stewardship workshops suggested candidate actions and performance measures to DOE to implement the long-term stewardship activities related to controls. Other candidate actions are based on the *Sitewide Institutional Controls Plan* (DOE/RL-2001-41). These suggested candidate actions are shown graphically in Figure 2-3, and presented in detail in Table 2-1, along with their associated performance measures. Except for the actions based on RL's commitments in DOE/RL-2001-41, the suggested candidate actions may not reflect the final actions that will be conducted for long-term stewardship.

Figure 2-3. Overview of Candidate Actions to Manage Post-Cleanup Completion Residual Risks.

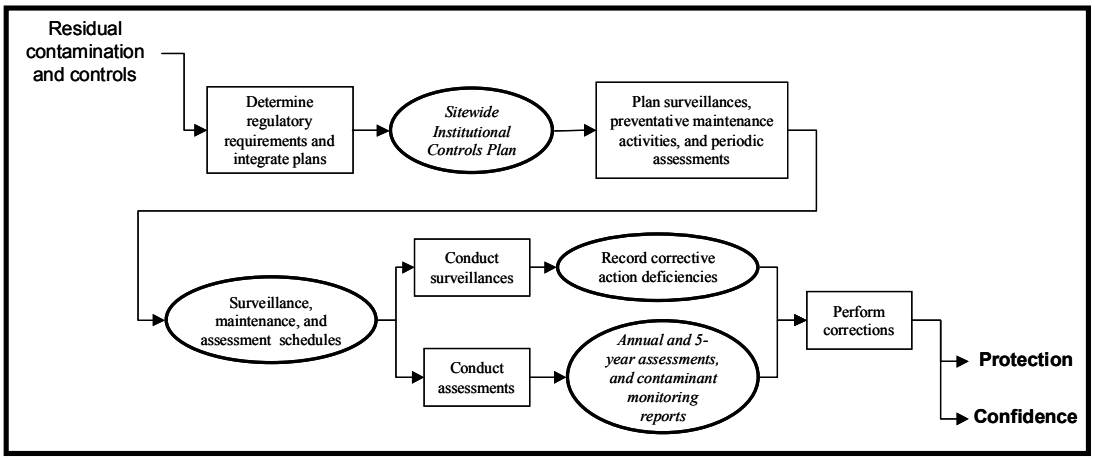


Table 2-1. Candidate Implementation Actions and Performance Measures for Managing Residual Risks Suggested to the U.S. Department of Energy.

Suggested Candidate Implementation Actions	Suggested Candidate Performance Measures
1) Integrate institutional controls required by CERCLA by establishing, maintaining, and updating an approved sitewide institutional controls plan that incorporates public involvement and is approved by DOE, EPA, and Ecology.	• Issuance of the Sitewide Institutional Controls Plan. • Periodic review and approved updates of the plan, as necessary.
2) Develop and implement an institutional controls assessment process to evaluate the effectiveness of the institutional controls.	• Issuance of an institutional controls assessment guideline. • Regular assessment reports, including the annual assessment of institutional controls as required by the approved *Sitewide*
3) Conduct an effective program for the surveillance and maintenance of institutional controls and engineered barriers to ensure they remain protective until the risk no longer exists.	• Institutional Controls Plan. • Surveillance and maintenance conducted on time per pre-established schedules. • Deficiencies entered into appropriate contractor's corrective action system and dispositioned in a timely manner. • Regular contaminant monitoring reports and five-year reviews.

The candidate actions and performance measures listed in this table were suggested by participants of the long-term stewardship workshops, unless otherwise noted. Except for the actions based on RL's commitments in DOE/RL-2001-41, the suggested candidate actions may not reflect the final actions that will be conducted for long-term stewardship.

DOE/RL-2001-41, 2002, *Sitewide Institutional Controls Plan for Hanford CERCLA Response Actions*, Rev. 0, Fluor Hanford, Richland, Washington.

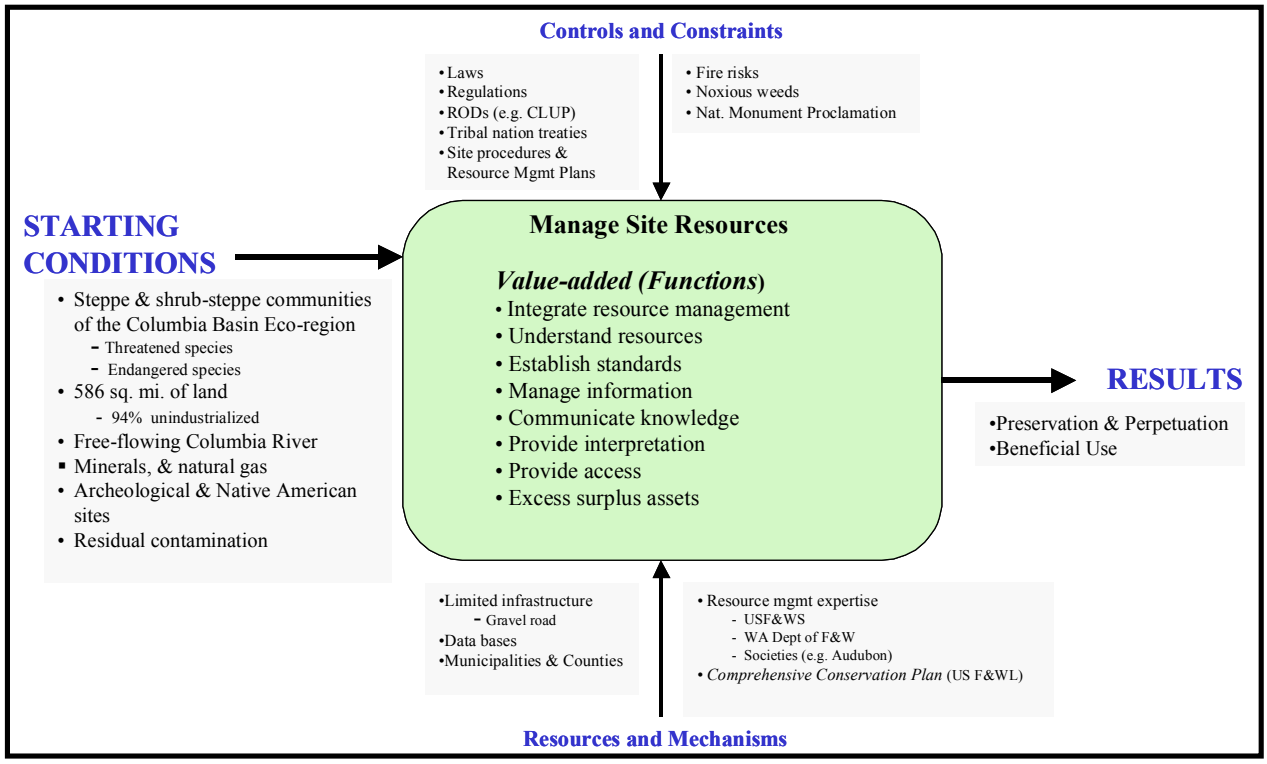
2.2.2 Manage Site Resources

2.2.2.1 Implementation Strategy

Management of the biological, natural, and cultural resources is a key strategy to achieve the mission and vision of long-term stewardship. Biological, natural, and cultural resources will be preserved and the natural ecosystem will be supported. 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 (see Figure 2-4).

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

Figure 2-4. Implementation Strategy to Manage Site Resources.



A clear understanding of the characteristics, nature, and condition of key Site resources shall be maintained and a standard (i.e., basis for comparison) for the key Site resources shall be used to make resource, access and utilization 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 residual contamination. Key resources shall be managed with regards to the potential interface with residual hazards 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.

2.2.2.2 Current Conditions

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 2-5). 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.

Figure 2-5. 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 1850s 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).

At the completion of the cleanup mission, the vision for the "end state" 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, WA Department of Fish and Wildlife, US Army, Audubon Society); 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 administrative controls will have shrunk to about 75 square miles, and the remainder (about 511 square miles) will have either been excessed or transferred to another Federal agency unless new or ongoing missions are in place at the completion of the cleanup mission.

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

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." 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*, and the *DOE Organization Act of 1977*.

Currently, Hanford has multiple Resource Management Plans that have been developed to protect and provide 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. Hanford Area Management Plans are management plans for specific geographic areas, which may include specific resource management plans, mitigation strategies, and various uses and facilities. Implementation of these plans represent a significant portion of the long-term stewardship activities that are currently ongoing at the Site.

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, to determine their interests, concerns, and expectations; and identifying forces beyond DOE control that are adversely impacting important cultural resources (e.g., looting, erosion).

DOE/EIS-0222-F 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 1-2);

2. Land-use definitions that describe the purpose, intent, and principal use(s) of each of the land-use designations in the CLUP;

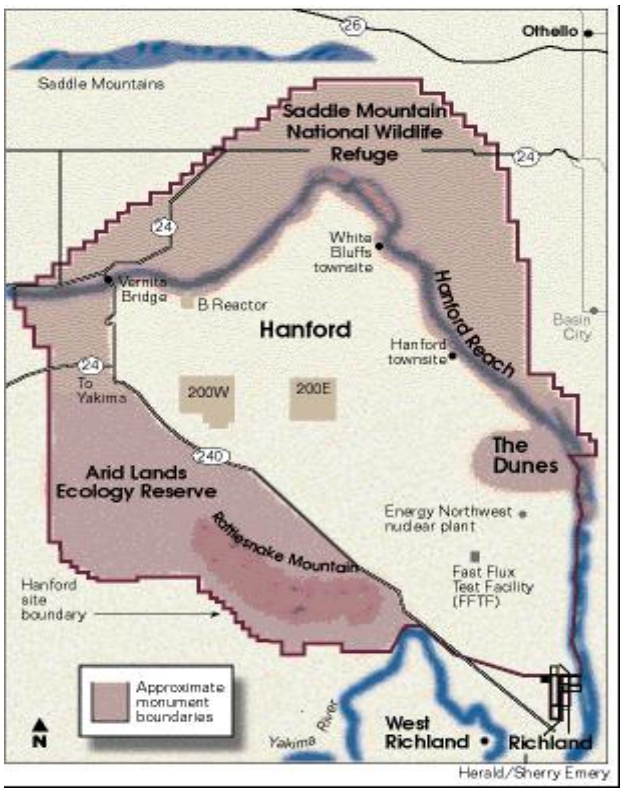
3. Policies that direct land use actions and identify Resource Management Plans and Area Management Plans that shall be considered for development or revision; and

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 conservation, approximately 305 square miles of the Site have been set aside as the Hanford Reach National Monument (or National Monument, see Figure 2-6). 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 U.S. Fish and Wildlife Service (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) EIS (equivalent to an area management plan for the Monument and DOE is participating in the CCP process.

Figure 2-6. Hanford Reach National Monument.



DOE may consider portions of the Hanford Site to be excess prior to the completion of the cleanup mission. An example of the release of land to other entities, along with the associated long-term stewardship actions, is described in Figure 2-7. A description of what the Hanford Site might be at the conclusion of cleanup in 2035 from the PMP is in Appendix A.

2.2.2.3 Suggested Candidate Actions

Participants of the long-term stewardship workshops suggested candidate actions and performance measures to DOE to implement the long-term stewardship activities related to managing Site resources. These suggested candidate actions are presented in Table 2-2, along with their associated performance measures. The suggested candidate actions may not reflect the final actions that will be conducted for long-term stewardship.

Figure 2-7. Long-Term Stewardship Case Study: 1100 Area.

Background: The 1100 Area, located just north of Richland, served as the central warehousing, vehicle maintenance, and transportation operations center for the Hanford Site. The operations in the 1100 Area contaminated soil and groundwater with volatile organic compounds, heavy metals, pesticides, and other organics. In 1989, EPA placed the 1100 Area on the NPL. The boundaries of the 1100 Area NPL Site were defined based on the location and nature of the contamination discovered, rather than the boundaries used by DOE to define the 1100 Area.

Cleanup: Cleanup activities for the 1100 Area NPL Site began in 1993 under CERCLA and included excavating contaminated soil and transporting it offsite for incineration or disposal at approved facilities, backfilling excavated areas with clean fill, sealing and capping the Horn Rapids Landfill to prevent contact with contamination, and a groundwater monitoring program that will continue until cleanup goals are met by natural attenuation. Cleanup was completed in 1995 and in 1996. EPA deleted the Hanford 1100 Area from its NPL list of hazardous waste sites.

Reuse: Reuse of portions of the 1100 Area began in 1998. In March, DOE leased a portion of the Transportation Maintenance Building and rail yard to the Livingston Rebuild Center for a locomotive maintenance and repair facility. Soon after, 1.2 square miles of the Hanford 1100 Area were transferred to the Port of Benton, with 26 buildings and 16 miles of rail track at the southern end of the Hanford railroad. The area is now the nucleus for developing a regional transportation and industrial center linking Richland to resources nationwide.

Protection from Residual Contamination: To ensure the reliability of the cleanup and minimize the possibility of future threats, legal restrictions were placed in the deed to prevent groundwater use and drilling. The remedy for the Horn Rapids Landfill (which was a part of the 1100 Area NPL Site but not part of the original 1100 Area and was not included in the land transferred out of DOE control), resulted in hazardous substances remaining on site above health-based levels. Therefore, EPA reviews the site every five years to ensure that the remedy continues to provide adequate protection of human health and the environment. Also, a deed restriction has been filed with Benton County that restricts future land uses in the vicinity of the landfill.

Sources:

DOE/EIS-0222-F, 1999, *Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement Record of Decision*, U.S. Department of Energy, Washington, D.C.

DOE/EA-1260, 1998, *Environmental Assessment for the Transfer of 1100 Area, Southern Rail Connection and Rolling Stock*, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

"Returning Superfund Sites to Productive Use Hanford 1100 Area Richland," Washington, http://www.epa.gov/superfund/programs/recycle/casestud/hanfcsi.htm (downloaded August 23, 2002).

Table 2-2. Candidate Implementation Actions and Performance Measures for Resource Management Suggested to the U.S. Department of Energy.[a]

Suggested Candidate Implementation Actions	Suggested Candidate Performance Measures
1) Develop an integrated program to manage the Site resources.	• Definition in a Records Information Management System (RIMS) Program. Description of the functions, roles and responsibilities, policies and procedures for conducting an integrated program. • Central information source for key Site resources. • Contract specifications. • Description of methods (e.g., MOU) of coordination with other agencies (e.g., USF&WS, State F&WS). • A goal for the condition of the key Site resources. • Issuance of new and updates to existing Resource Management Plans. • Investigation of the utility of integrating procedures from the Resource Management Plans into an integrated Site Resource Management Manual. • An Access Improvement Plan that identifies areas where access is reasonable and safe while considering the diverse interests regarding Site access.
2) Communicate information about the Site resources and provide education regarding the value and condition of the resources.	• Issuance of a communication plan.
3) Monitor, measure, and evaluate the condition of the Site resources periodically to identify, track, and prevent potential negative affects from residual contamination.	• Periodic reports on the current condition of Site resources. • Annual Environmental Report. • Corrective action plans.
4) Implement the CLUP while managing Site resources within the context of the entire Site and future needs by establishing the appropriate policies and procedures for future use decisions.	• Establishment of the appropriate policies and procedures in RL Integrated Management System for future use decisions.

[a] The candidate actions and performance measures listed in this table were suggested by participants of the long-term stewardship workshops. The suggested candidate actions may not reflect the final actions that will be conducted for long-term stewardship.

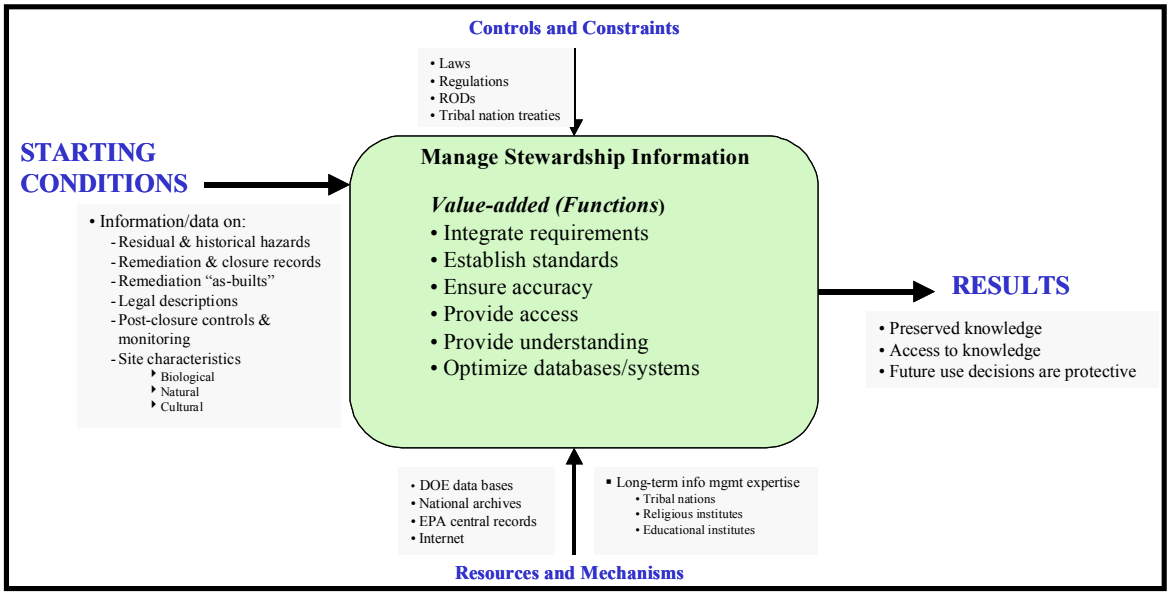
2.2.3 Manage Stewardship Information

2.2.3.1 Implementation Strategy

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

The ability of current and future generations to access and understand Site stewardship information is crucial. At the completion of the cleanup mission, the vision for the "end state" of stewardship information includes the following: all necessary information generated during the cleanup mission that may be necessary to long-term stewardship is preserved; and such information is available to future Site stewards for access in a timely and cost-effective manner (see Figure 2-8).

Figure 2-8. Implementation Strategy to Manage Stewardship Information.



The necessary and sufficient records and data requirements for long-term stewardship will be identified and the associated systems that house and manage the data optimized. 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 long-term stewardship activities and inform the public regarding long-term stewardship will be readily accessible. Long-term stewardship information shall be maintained and preserved for the length of time required to support the activities of current and future Site stewards.

2.2.3.2 Current Conditions

Stewardship information is the information required to support long-term stewardship activities. DOE and others who will be responsible for long-term stewardship 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. It is also important for information to be

accessible to those who live and work in the surrounding communities and might be affected by hazards that remain at the Site and to those who are responsible for community planning and development.

The types of information that may be needed to support long-term stewardship may include the following:

- Regulatory/Legal Framework. Regulatory framework (past and present); requirements specific to transfer/closure and post transfer/closure; site location information and legal description; real estate records.

- Hazards and Controls. Information regarding existing hazards, past and present releases and accidents; disposition of historical hazards; information about all remedial actions taken, including about a waste site's content, condition, and other key characteristics; information regarding existing barriers and institutional controls for preventing exposures; "As-built" condition of physical barriers and monitors.

- Operations and Activities. Site history; process history; historical infrastructure; post-cleanup/transfer operations and infrastructure.

- Site Characteristics/Settings. Information about biological, natural, and cultural resources and geophysical information.

- Effectiveness of Remedies. Information about the remedies in place, their expected and actual effectiveness, and the reasons for selecting the remedies.

Many times the same stewardship information may fall into more than one of the categories listed above.

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.

Approximately 3,000 ft^3 of active records are stored in repositories onsite. Not all of these records are required to be retained for long-term stewardship. Environmental documents that are a part of the Hanford Site Environmental Administrative Record are located in the Environmental Data Management Center and four Public Information Repositories in the Northwest. Inactive records storage includes: local Records Holding Area (15,000 ft^3), two satellite storage areas (11,000 ft^3), and the Seattle Federal Records Center (45,000 ft^3).

The Records Inventory and Disposition Schedules provides the schedules for the periodic disposal and retention of records in accordance with established time periods. 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. Records of historic Hanford operations are not complete and may not conform to current requirements. 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, the closure plans for hazardous waste units under RCRA must include information on steps required for closure, post-closure care requirements, which is required for 30 years. The closure report must be placed onto the deed indefinitely (40 CFR 265).

In addition, 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 ten-year period, DOE will notify the EPA and Ecology at least forty-five 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. Some of these systems are available to the general public on the Internet, others are available to DOE personnel and contractors on the Hanford Site Intranet, and still others are stand-alone systems.

Options available to persons or organizations outside of DOE who wish to access a particular record or set of records include the following (this is not an exhaustive list and other information resources are available, e.g., citizen groups, DOE contractors):

1. **Public Reading Rooms.** Visit Hanford public reading rooms, which contain hard copies of all public documents produced by DOE at the Hanford Site.

2. **Hanford Internet Site** (http://www.hanford.gov/). Search the Hanford Internet site, which provides electronic access to some of the onsite databases.

3. **Freedom of Information Act (FOIA) Request.** Submit a request to DOE under the FOIA, which prescribes procedures for public access to certain information maintained by the Federal government.

4. **Prior Arrangement**. Where a previous arrangement has been made to provide information directly to the requester, submit a request to the appropriate Hanford Site Point of Contact, (e.g., when property is to be transferred to another entity there may be an agreement to provide any information useful to the future user).

With the voluminous amount of data and information that will be available at the completion of cleanup, additional work will have to be done to identify the specific types of information and storage/retrieval mechanisms for ready availability.

Recently, DOE-HQ has initiated an effort to develop a records management policy that will address some of the outstanding records management issues associated with Long-term

Stewardship, particularly for closure sites. Future updates of this plan will incorporate the records management policy when it is finalized.

2.2.3.3 Suggested Candidate Actions

Participants of the long-term stewardship workshops suggested candidate actions and performance measures to DOE to implement the long-term stewardship activities related to information management. These suggested candidate actions are presented graphically in Figure 2-9 and listed in Table 2-3, along with their associated performance measures. The suggested candidate actions may not reflect the final actions that will be conducted for long-term stewardship.

Figure 2-9. Overview of Candidate Actions to Manage Stewardship Information.

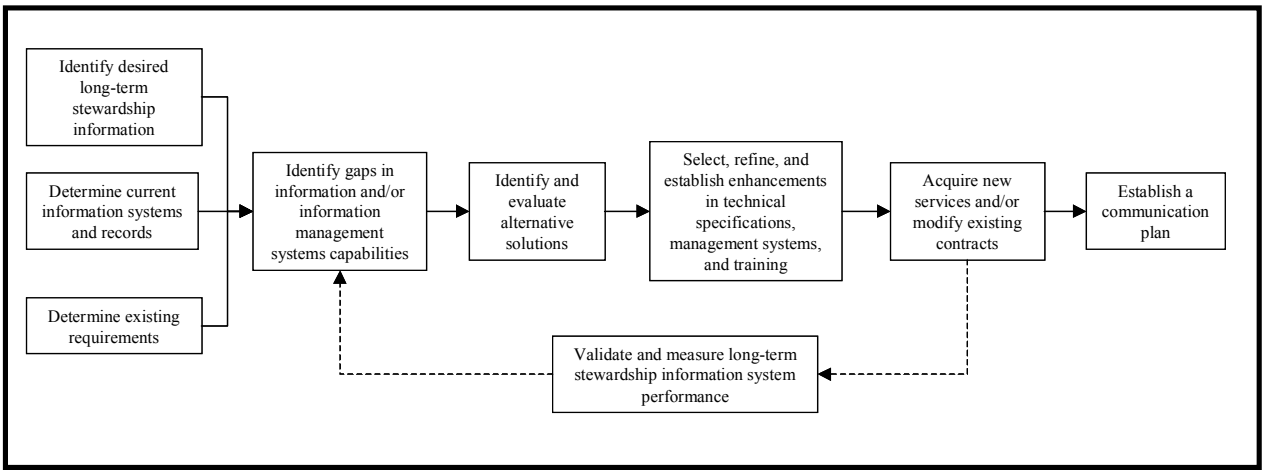


Table 2-3. Candidate Implementation Actions and Performance Measures for Information Management Suggested to the U.S. Department of Energy.[a]

Suggested Candidate Implementation Actions	Suggested Candidate Performance Measures
1) Perform a mission analysis and systems review of long-term stewardship information management needs, the information that exists, the current capabilities of the information management systems, and current records retention requirements.	• Identify the information that is required for LTS and the basis for the requirements. • Mission analysis and systems review of long-term stewardship information management needs, the information that exists, the current capabilities of the information management systems, and current records retention requirements.
2) Identify the gaps in the information that is being generated.	• Documented gap analysis.
3) Identify and evaluate alternative solutions to address the gaps and select, refine, and establish the required enhancements.	• Summary evaluation of alternative solutions. • Recommended enhancements.
4) Implement the selected solution.	• Acquire the new services and/or modify existing contracts as needed. • Data standards included in appropriate Site Technical Requirements documents.
5) Continue assessment of the long-term stewardship information system by validating and measuring its performance.	• Regular assessments.
6) Establish a communication plan to ensure information regarding residual risks, institutional controls, and potentially related Site resources is accessible and clearly communicated to affected parties.	• Communication plan.

[a]The candidate actions and performance measures listed in this table were suggested by participants of the long-term stewardship workshops. The suggested candidate actions may not reflect the final actions that will be conducted for long-term stewardship.

2.2.4 Use Science and Technology

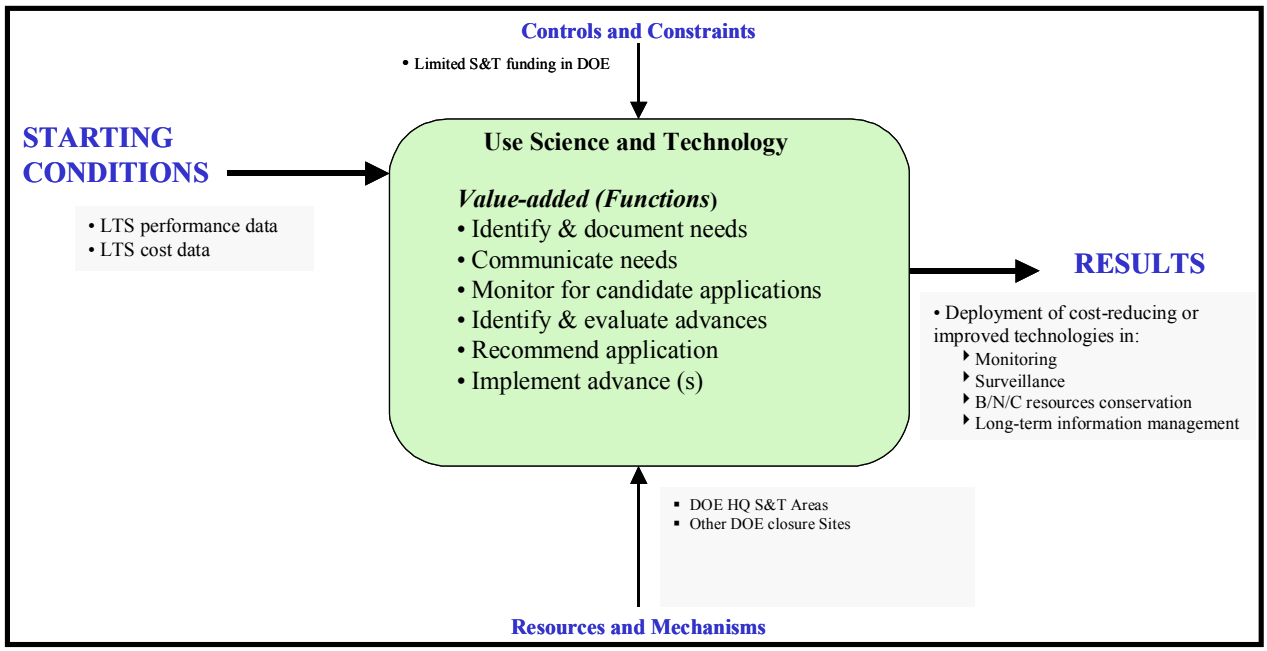
2.2.4.1 Implementation Strategy

Advances in science and technology can have profound influences on the ability to perform long-term stewardship more efficiently and effectively (see Figure 2-10).

Advances in science and technology will be deployed where appropriate and cost effective, to increase the effectiveness of long-term stewardship activities by reducing risk and costs, increasing efficiencies, and accelerating the final cleanup.

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.

Figure 2-10. Overview of Implementation Strategy to Use Science and Technology.



Science and technology is recognized as an important tool for efficient and effective LTS. As such, the use of technology advances shall be built-in to the LTS processes and designs.

2.2.4.2 Current Conditions

Long-term stewardship 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 horizon 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. As another example, 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 long-term stewardship needs. Such advances would help to perform long-term stewardship more efficiently and effectively.

Lysimeter
(photo provided by another DOE site)

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 Long-Term Stewardship Program.

Potential applications to Hanford will be pursued as results from research and development of scientific knowledge and technologies at other DOE sites become available.

2.2.4.3 Suggested Candidate Actions

Participants of the long-term stewardship workshops suggested candidate actions and performance measures to DOE to implement the long-term stewardship activities related to science and technology. These suggested candidate actions are presented graphically in Figure 2-11 and listed in Table 2-4, along with their associated performance measures. The suggested candidate actions may not reflect the final actions that will be conducted for long-term stewardship.

Figure 2-11. Overview of Candidate Actions to Use Science and Technology.

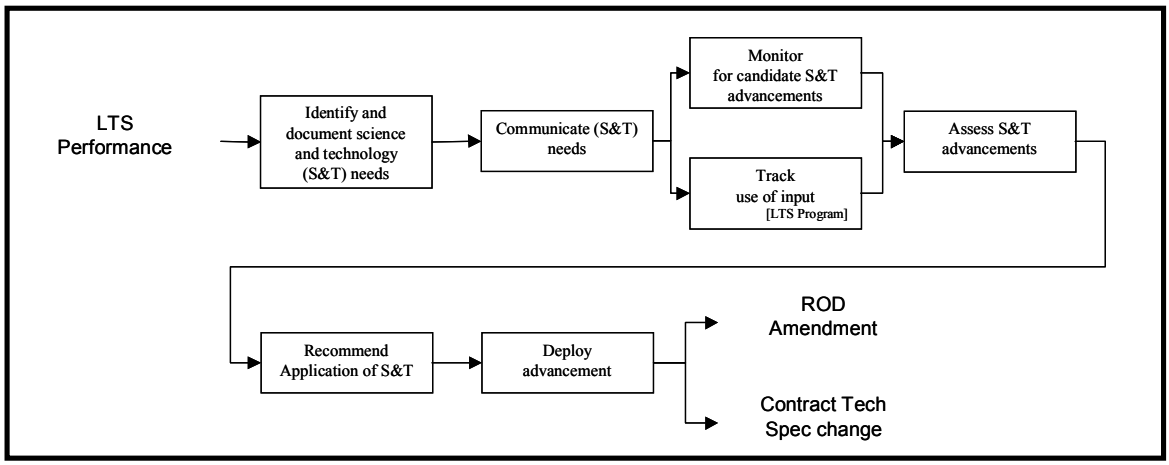


Table 2-4. Candidate Implementation Actions and Performance Measures for Science and Technology Suggested to the U. S. Department of Energy.[a]

Suggested Candidate Implementation Actions	Suggested Candidate Performance Measures
1) Identify the science and technology needs for long-term stewardship early in the planning processes to maximize out-year efficiencies and cost reduction.	• Point Paper published on the needs.
2) Communicate the LTS S&T needs to local and national S&T coordination teams, such that the pursuit of advancements is coordinated with related efforts.	• Periodic presentations to appropriate organizations. • Periodic follow-up with the Headquarters Office of Science & Technology.
3) Identify and assess advances in science and technology for potential beneficial improvements in conducting long-term stewardship activities.	• Analytical paper discussing benefit – costs of applying a developed technology. • Briefings to DOE Site Management Board (as needed). • ROD amendments, as appropriate.
4) Implement advancements.	• Contract technical specifications changes, as appropriate.

[a]The candidate actions and performance measures listed in this table were suggested by participants of the long-term stewardship workshops. The suggested candidate actions may not reflect the final actions that will be conducted for long-term stewardship.

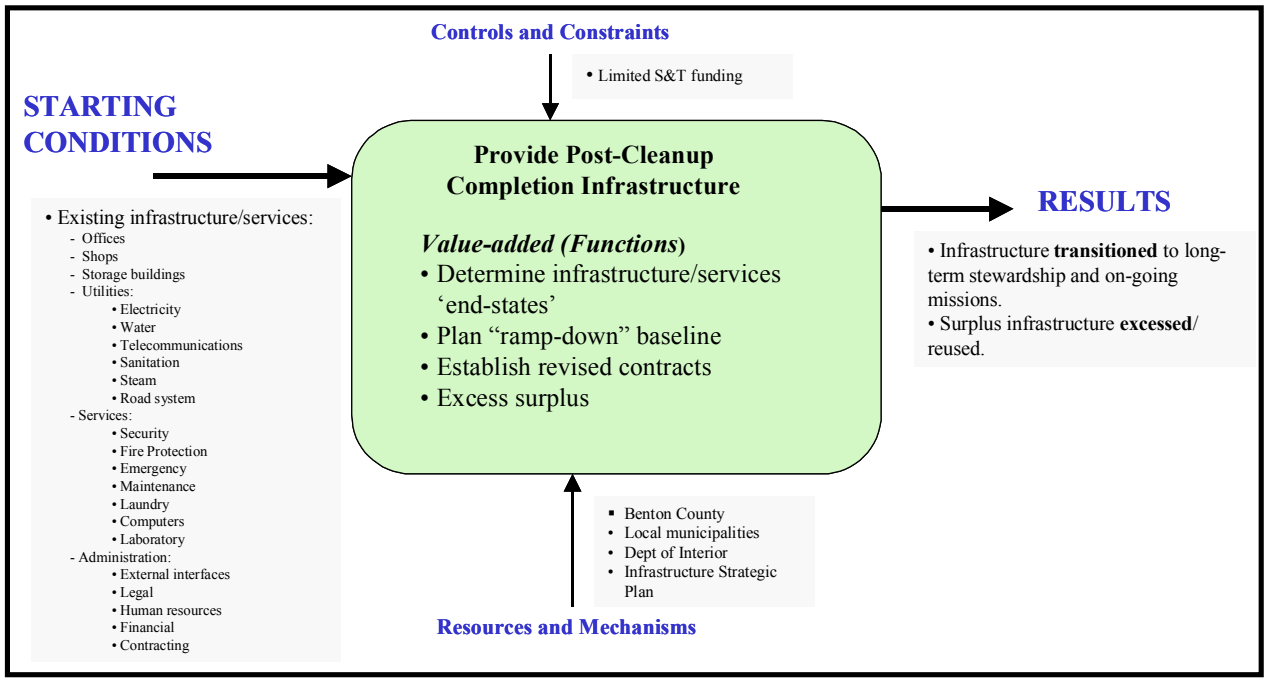
2.2.5 Provide Post-cleanup Completion Infrastructure

2.2.5.1 Implementation Strategy

A nominal, but adequate post-cleanup completion infrastructure is needed to successfully implement long-term stewardship. Transition strategies will be developed for the infrastructure so that the remaining site infrastructure will be adequate to support long-term stewardship and any continuing or new missions. Reuse of the physical infrastructure systems by other entities (e.g., federal or local government) when they are no longer needed to support the remaining Site missions will be a key consideration (see Figure 2-12).

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

Figure 2-12. Overview of Implementation Strategy to Provide Post-Cleanup Infrastructure.



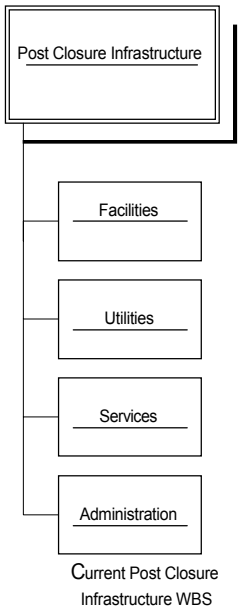
Infrastructure requirements for supporting long-term stewardship and ongoing missions shall be integrated into the planning decisions for the cleanup and final disposition. Infrastructure systems may be provided through contracts with local service providers when it is not cost-effective for DOE contractors to perform the service.

The information in this section is presented in the same format as the previous sections; however, in addition to providing a discussion of the current infrastructure, the first section also includes a brief discussion of the anticipated state of the infrastructure upon completion of the cleanup mission and the transition to long-term stewardship.

2.2.5.2 Current Conditions

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 2-13). These are referred to collectively as "infrastructure systems."

Figure 2-13. Key Elements of the Post-Cleanup Infrastructure Work Breakdown Structure.



- **Facilities.** Facilities are the physical infrastructure, including: (1) operational facilities (including offices, laboratories, shops, warehouses and active waste management facilities) that may remain on the Site and (2) the transportation system (including roads, railroad, and parking lots). "Shut down" facilities would be included under the surveillance element of controls. Physical barriers and signs are considered as institutional controls (see Section 2.2.1).

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

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

- **Administrative.** The administrative element of post-cleanup completion infrastructure includes the following areas: regulator/stakeholder/Tribal Nation interface (i.e., external affairs); interagency coordination; and program management, which includes legal, human resources, financial, contracting. Program management also includes the management of easements across the Site. The administrative elements that are expected to be unique to post-cleanup completion 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 long-term stewardship related infrastructure may then be reduced, contracted, or remotely supplied by another DOE field office.

DOE must decide which infrastructure systems should be maintained through the completion of cleanup and into post-cleanup and which systems should be operated without preventative maintenance. Factors that will be considered include:

Fire Fighting

- The cost of providing the infrastructure as compared to the money that can be saved to further accelerate remediation.
- The infrastructure systems that will still be needed to support the other functions of long-term stewardship and ongoing missions after the completion of the cleanup mission.
- 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.

The *Hanford Site Infrastructure Restoration Plan* (dated October 2000) provides a strategic plan to improve and maintain the infrastructure based on mission planning for the next ten years. To plan for meeting the infrastructure needs beyond the ten-year horizon, the *Hanford Site Infrastructure Restoration Plan* should be expanded to include:

- A time horizon that includes the end of the cleanup mission.
- An evaluation of the cost-effectiveness of the systems.
- The identification of the anticipated needs to support long-term stewardship and projected remaining or new missions.
- A closure strategy (or reduction) for each system based on the anticipated need and cost effectiveness of the systems.

Table 2-5 lists the current infrastructure systems and services and the anticipated need for each at the completion of the cleanup mission. For example, at the point where it is no longer necessary to maintain paved roads for safe transport of material and personnel and ongoing operations, the roads would no longer be maintained and/or the road could be transferred to the local jurisdiction if the road is still of value. However, some infrastructure will need to remain 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).

Portable

Table 2-5. Infrastructure Elements and Their Anticipated Importance in Supporting Post-Cleanup Stewardship and Continuing Missions.[a]

Infrastructure	Element	Anticipated Post-Cleanup Completion Need
Facilities	Office	Limited
	Shop	Limited
	Warehouses	Limited
	Training	Limited
	Waste Processing	Limited
	Waste Shipping	Limited
	Lab	Limited
Utilities	Electrical	Yes
	Telecommunications	Yes
	Water	Yes
	Sanitary Waste	Yes
	Steam	TBD
Services	Safeguards and Security	Yes
	Fire Protection	Yes
	Maintenance	Yes
	Emergency Services	Yes
	Laundry	TBD
	Analytical Services	Yes

[a]The information presented in this table is preliminary. Future updates to the *Hanford Site Infrastructure Restoration Plan* should include analyses that identify the specific infrastructure needs anticipated for post-closure, as well as an evaluation of the types of services that can be provided to meet those needs.

For example, it is envisioned that the need for a complex electrical distribution system in the more remote areas will diminish as the cleanup progresses to a point that it will no longer be required. At that point in time, the monitoring systems left in place in those areas will be powered by alternate 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 to another DOE program office or another federal entity.

2.2.5.3 Suggested Candidate Actions

Participants of the long-term stewardship workshops suggested candidate actions and performance measures to DOE to implement the long-term stewardship activities related to post

clean-up infrastructure. These suggested candidate actions are presented in Table 2-6, along with their associated performance measures. The suggested candidate actions may not reflect the final actions that will be conducted for long-term stewardship.

Table 2-6. Candidate Implementation Actions and Performance Measures for Post-cleanup Infrastructure Suggested to the U.S. Department of Energy.[a]

Suggested Candidate Implementation Actions	Suggested Candidate Performance Measures
1) Develop an Infrastructure Needs Document that identifies and characterizes the infrastructure systems and the level of service needed at the Site over the long term and at end states.	• Infrastructure Needs documentation.
2) Develop recommendations for how to provide the services and how to disposition the infrastructure systems when no longer needed.	• Issuance of an Infrastructure Closure Plan.
3) Integrate long-term stewardship infrastructure requirements into the planning decisions for cleanup budgets and contracts.	• Integration of infrastructure requirements in cleanup budgets and contracts.

[a]The candidate actions listed in this table were suggested by participants of the long-term stewardship workshops. The suggested candidate actions may not reflect the final actions that will be conducted for long-term stewardship.

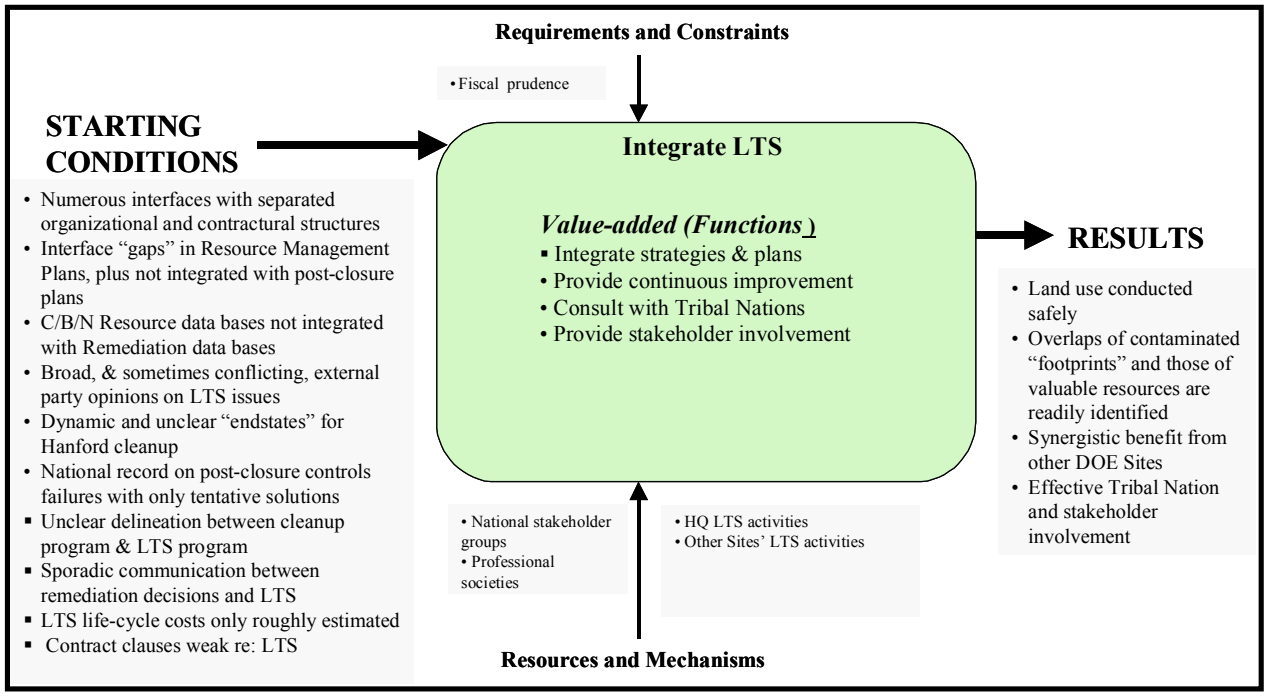
2.2.6 Integrate Long-term Stewardship Responsibilities

2.2.6.1 Implementation Strategy

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

Integration of the stewardship responsibilities of the various Site programs is key to effectively achieving the long-term stewardship mission and vision. Integration will include the identification of various Site programs and requirements that support long-term stewardship; the identification of the relationships, or interfaces, among these programs; and the planning and coordination of the activities within each of these programs to achieve the long-term stewardship mission, vision, and goals (see Figure 2-14). These activities must be conducted in a manner that is mutually supportive in reaching the same long-term stewardship goals. Integration of the long-term stewardship activities will allow for decision-making to ensure consistency and provide opportunities to gain efficiencies, which may result in lower future costs.

Figure 2-14. Overview of Implementation Strategy to Integrate Long-term Stewardship Responsibilities.



2.2.6.2 Current Conditions

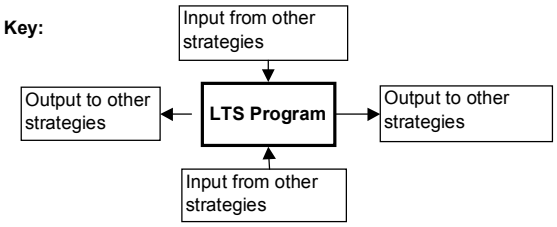
The various programs that implement the long-term stewardship strategies are described in Sections 2.2.1 through 2.2.5. Long-term stewardship includes activities that span across multiple programs and historically have been managed as discrete programs that now must be integrated when conducting activities related to long-term stewardship. Identification of the key interfaces between the activities is an important step in this integration.

Bull Elk

The key interfaces between the strategies and their relationships are depicted in Figure 2-15. A simple example of the relationships between these strategies is the relationship between assuring controls and managing Site resources. Fences, installed to prevent intrusion and minimize the risk of exposure to residual contamination, may affect 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. Impacts to the resource management plans may impact their type, location or drive the need for other controls. An aspect that is not readily apparent is the need to monitor site resources and the types of access required.

Figure 2-15. Key Interfaces in the Long-Term Stewardship Program.

Implementation Strategies	LTS OUTPUT / INTERFACE					
LTS INPUT/ INTERFACE	**Manage Residual Risks**	Biological, natural, & cultural resources are not harmed by residual contamination Engineered barriers and physical controls prevent or otherwise affect the movement of animals	Information on existing controls that needs to be preserved for the long-term	Need for improved technologies so that the development, installation, maintenance, and monitoring of controls can be done more cheaply, more quickly, and result in improved performance	Need for infrastructure to conduct surveillance, maintenance, and monitoring of controls	Control requirements and programs
	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	Site resource requirements and programs
	GIS Map-based, WEB-enabled, multigovernment-linked information on remediation, controls, and Site resources; with 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	Information requirements and programs
	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	Science and technology requirements and programs
	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**	Post-cleanup infrastructure requirements and programs
	Integration helps to support decision making, ensure consistency, and provide opportunities to gain efficiencies					**Integrate Long-term Stewardship Responsibilities**

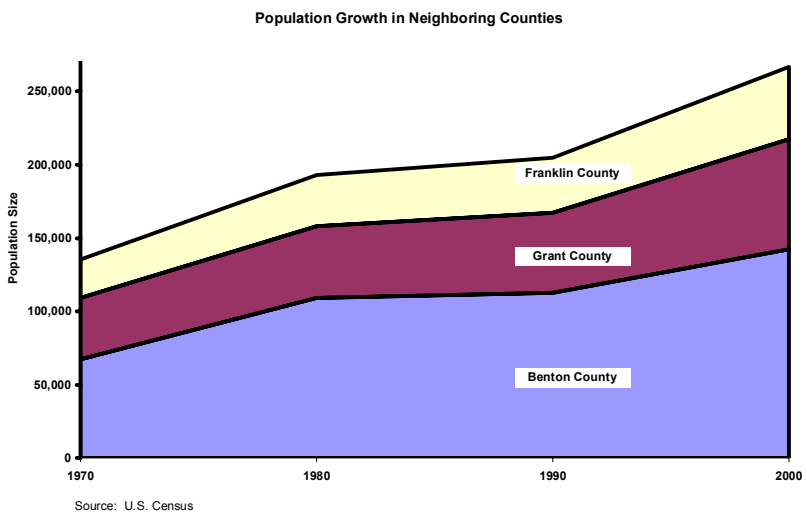


Furthermore, two of the long-term stewardship strategies, – manage stewardship information and use science and technology, – are inherently related to the other strategies. Much of the information to be managed includes the information related to assuring controls and managing Site resources. Similarly, the development of new and improved technologies might help to not only further remove residual contamination but 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 programs implementing long-term stewardship requires an understanding of the changing nature of the environment within which long-term stewardship occurs. The inputs, program resources, and controls and constraints considered in the development of the long-term stewardship strategies, are likely to change significantly over time (see Figure 2-16). As a result, the integration of the implementation strategies will be flexible and evolutionary in nature and include a continuous evaluation to identify improvement opportunities.

Figure 2-16. Examples of Dynamic Influences on Long-Term Stewardship.

- The nature and characteristics of both the area and the surrounding region also 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 (see figure). If the population in the communities surrounding areas continues to grow, limited land availability could increase the relative value of property that have low levels of residual contamination.



- The characteristics of residual hazards that are remaining on site, 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 de-listed as endangered or threatened).

2.2.6.3 Suggested Candidate Actions

The candidate actions suggested to DOE to integrate long-term stewardship responsibilities are presented in Table 2-7, along with their associated performance measures. These suggested actions include developing an integrated program to manage long-term stewardship, developing a plan to regularly assess and evaluate performance, tracking and monitoring national LTS issues, evaluating and developing alternative Site exit strategies, and developing a communication plan to ensure the surrounding communities, populaces, and Tribal Nations have the opportunity to participate in the planning processes and have access to information regarding

long-term stewardship. The suggested candidate actions may not reflect the final actions that will be conducted for long-term stewardship.

Table 2-7. Candidate Implementation Actions and Performance Measures for Integration Suggested to the U.S. Department of Energy.[a]

Suggested Candidate Implementation Actions	Suggested Candidate Performance Measures
1) Develop an integrated program to manage long-term stewardship.	• Definition of the functions, roles and responsibilities, policies and procedures for conducting an integrated program. • Master summary schedule for integrating long-term stewardship. • Funding plan for long-term stewardship.
2) Evaluate and develop alternative exit strategies.	• Publish an Exit Strategies Plan.

[a] The candidate actions and performance measures listed in this table were suggested by participants of the long-term stewardship workshops as well as by DOE staff. The suggested candidate actions may not reflect the final actions that will be conducted for long-term stewardship.

3.0 MANAGEMENT APPROACH

This chapter describes the management approach for implementing long-term stewardship

The management approach for long-term stewardship is designed to balance the competing long-term stewardship priorities and provide a consistent approach to implementing long-term stewardship, so as to achieve the long-term stewardship mission and vision with the most efficient method.

The three elements of long-term stewardship, -- management of residual risk, protection of Site resources, and reuse of Site assets, -- complement one another and often act in concert with one another (see Figure 3-1). However, many of the core values within each of these three elements solely focus on that element (in some cases at the expense of one or both of the other elements) which leads to competing priorities. Examples of some of these potential competing priorities, or tradeoffs that may occur, are presented in Figure 3-2. When making long-term stewardship decisions, near-term and long-term (i.e., multi-generational) priorities, as well as local and national priorities often present different values, which result in competing priorities. Long-term stewardship decisions may affect the protection of human health and the environment for an indefinite period of time; therefore, such decisions must consider the long-term consequences, in addition to the short-term consequences. Also, local priorities may at times compete with the national priorities established for the Hanford Site by the federal government.

Figure 3-1. Long-Term Stewardship Elements Often Overlap and Complement One Another.

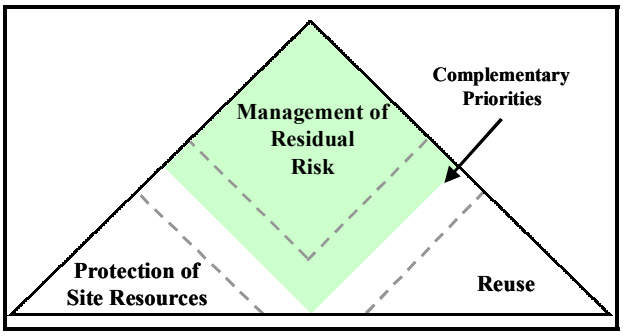
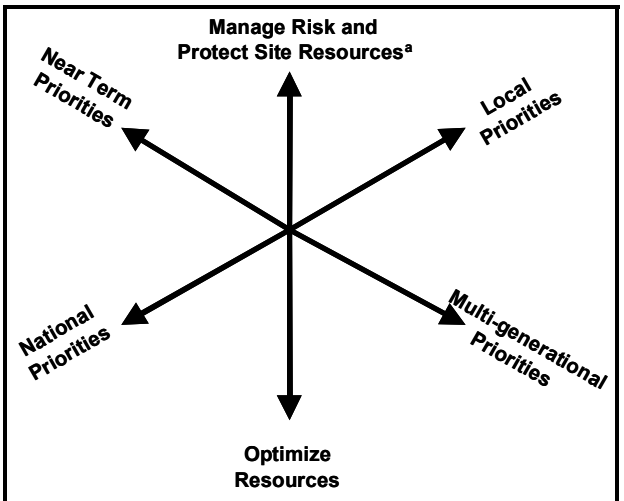


Figure 3-2. Considering Sometimes Competing Priorities.



[a]For the purposes of readability, this diagram presents two of the long-term stewardship elements, -- manage risk and protect Site resources, -- together on one side of the vertical axis. In practice, however, these elements may also compete with one another and tradeoffs may have to be made between them.

The management approach includes adherence to the long-term stewardship vision, mission, and goals to ensure a consistent vision is maintained for the long-term stewardship activities that are conducted by the various programs. The common goal for cleanup is represented by the end states that have been and are being developed through the cleanup regulatory process. DOE will be developing its cleanup completion and transition strategies to achieve these end states. Such consistency also will help in the evaluation of the accelerated cleanup decision options.

Cleanup Completion and Transition Strategy

In anticipation of completion of the accelerated EM cleanup mission, cleanup completion and transfer strategies for the River Corridor and the Central Plateau will be developed. As portions of the Site that have been approved for unrestricted use and for which the DOE no longer has a mission need, a plan to transfer these areas to other non DOE entities (i.e., other federal agencies, local governments or private entities) will be developed.

DOE's approach to close out the cleanup responsibilities and transition into post-cleanup can be summarized into the following strategic elements (see Figure 3-3).

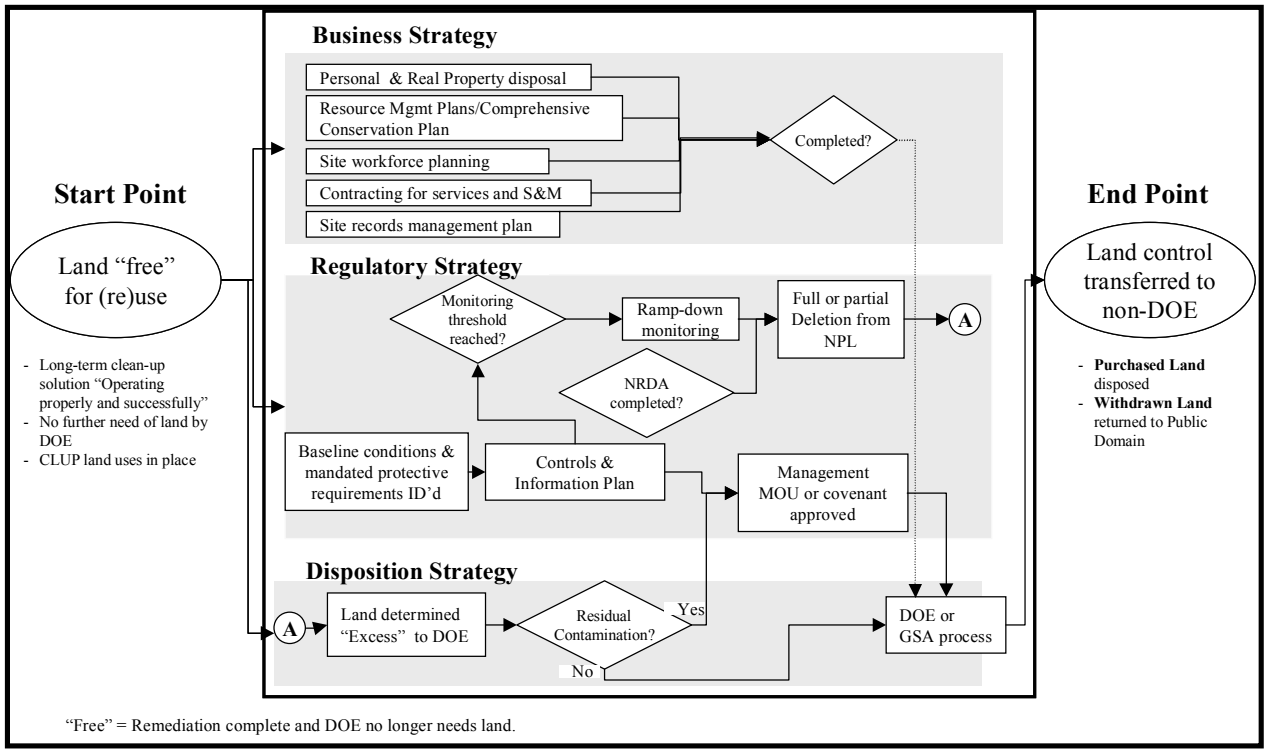
1. DOE's business management strategy includes DOE's plan for land use management and the business management of property in the transition of the Site from a cleanup mission to cleanup completion. Land use management, based on the CLUP ROD, helps to ensure the highest and best use of the land. The CLUP ROD contains the land-use map, land-use definitions, and the land-use policies that DOE uses to manage land use and its interactions with the local governments, stakeholders and the Tribal Nations. The plan for the business management of property includes how DOE will transition from a relatively large operations office that is responsible for DOE's current missions to a smaller field office in the future that will be responsible for oversight of the long-term stewardship mission and any other remaining mission(s). Business management includes office space planning, Site workforce planning, planning for the contracting of services where appropriate, and records management.

2. DOE's regulatory strategy guides it's activities to comply with the current and future regulatory requirements following the remediation process. This strategy assumes that the environmental restoration decisions have been made and fully executed in accordance with applicable regulatory requirements.

3. DOE's disposition strategy guides it in the transition of responsibility for excess land while ensuring ongoing protection from hazards that remain beyond cleanup. Once the cleanup remedial objectives have been reached for logical groupings of land and resources, DOE will closeout the cleanup process

Recent, new performance goals for Hanford's early closure, along with the designation of large portions of land as a National Monument, require that cleanup completion and transition strategies be developed soon and not at the end of the cleanup mission. The LTS Program will support the development and implementation of DOE's cleanup completion and transition strategies. The development of these strategies is a crucial element in the evaluation of the accelerated approaches and will ensure a compliant program is ready and able to meet DOE's long-term obligation once the cleanup mission is achieved.

Figure 3-3. U.S. Department of Energy Transition from Cleanup Completion for Excess Land (Simplified).



Performance Assessment

Integrated performance assessment requirements for long-term stewardship will be developed to assess and evaluate the performance of long-term stewardship for continual improvement, particularly from a site-wide perspective. Areas for improvement regarding the interface between cleanup and long-term stewardship may be identified to reduce cost and accelerate cleanup. Areas of assessment also will include the policies, goals, and outcomes for long-term stewardship.

National Long-Term Stewardship Activities

There are a number of activities related to long-term stewardship that are currently being explored at other DOE sites, DOE headquarters, and at other federal agencies. The program will track and monitor the progress of these activities to assess their applicability to the Hanford Site. If needed, the Hanford Long-Term Stewardship Program will be revised.

Communication Activities

The surrounding communities, populaces, and Tribal Nations have a stake in the outcomes of Hanford. Consequently, there is a need to ensure that these affected parties have the opportunity to participate in the planning processes. They also must have access to information regarding long-term stewardship.

DOE will develop a communications approach to identify how the affected parties can participate in the long-term stewardship planning process, as well as how the affected parties can access the related information. The experiences, priorities, and interests of the affected parties will be likely to vary greatly. The communications approach will be developed to encourage effective dialogue so that the parties are able to present their interests and better understand the diverse positions of the other parties. Consideration will be given to other Hanford public involvement activities to ensure an integrated approach that is focused on the significant Hanford issues.

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

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

Hanford Site Environmental Report for Calendar Year 2000, prepared for the U.S. Department of Energy by Pacific Northwest National Laboratory under Contract DE-AC06-76RLO1830, with contributions from CH2M Hill Hanford Group, Inc.; MACTEC-ERS; Fluor Hanford, Inc. and its affiliate companies; and Bechtel Hanford, Inc. and its subcontractors, Richland, Washington..

Hanford Site Infrastructure Restoration Plan, October 2000, DynCorp Tri-Cities Services, Inc. and Fluor Hanford, Richland, Washington.

Migratory Bird Treaty Act of 1918, 16 USC 703-712, et seq.

Mining Law of 1872, 30 USC 21 et seq.

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

Native American Graves Protection and Repatriation Act of 1990, 25 USC 3001-13 et seq.

Presidential Proclamation 7319 of June 19, 2000

Resource Conservation and Recovery Act of 1976, 42 USC 82.6901 et seq.

"Returning Superfund Sites to Productive Use Hanford 1100 Area" Richland, Washington, http://www.epa.gov/superfund/programs/recycle/casestud/hanfcsi.htm (downloaded August 23, 2002).

Sacred Sites Executive Order 13007, 1996, "Indian Sacred Sites," published at 3 CFR 196, 1997, as amended.

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

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

5.0 GLOSSARY

Area Management Plans - Management plans for specific geographic areas, which may include specific resource management plans, risk strategies, and various uses of facilities.

Candidate Species (Federal) - A wildlife species for which there is sufficient information on biological vulnerability and threat(s) to support issuance of a proposed rule to list it as endangered or threatened but issuance of the proposed rule is precluded (i.e., by other listing activity or lack of funding).

Candidate Species (State) - Wildlife species that are under review by the Washington Department of Wildlife for possible listing as endangered, threatened, or sensitive.

Closure - When the cleanup of a waste site area is certified as complete by the corresponding regulatory process; waste management activities are ceased and all material has been dispositioned and required environmental restoration activities are completed.

Decision document - The document in which the final cleanup decision for a particular waste site area, developed under the CERCLA or RCRA process, is described.

Endangered Species (Federal) - A wildlife species that is likely to become extinct throughout all or a significant portion of its range.

Endangered Species (State) - A wildlife species native to the state of Washington that is seriously threatened with extinction throughout all or a significant portion of its range within the state.

Engineered Controls - Man-made controls designed to isolate or to contain waste or materials, including, but not limited to, the following controls: radioactive, hazardous, and sanitary landfills; repositories; in-situ stabilization; and caps on residual contamination.

Institutional controls - Intended as a broad term, institutional controls generally include nonengineered restrictions on activities and access to land, groundwater, surface water, waste sites, waste disposal areas, and other areas or media that contain hazardous substances, to minimize the potential for human exposure to the substances. Common types of institutional controls include procedural restrictions for access, fencing, warning notices, permits, easements, deed notifications, leases and contracts, and land-use controls.

Long-term stewardship - Long-term stewardship at the Hanford Site is the management of residual risks (human health, ecological, and cultural) associated with any remaining residual contamination; the protection of the Site's cultural, biological, and natural resources; and the reuse of the Site's assets to encourage a healthy regional economy. It begins at cleanup completion.

Manager - Managing entity of a particular parcel of real estate.

Owner - Entity that owns a particular piece of real estate.

Record - Defined by the National Archives and Records Administration, records include all books, papers, maps, photographs, machine readable materials, or other documentary materials, regardless of physical form or characteristics, made or received by an agency of the United States Government under Federal law or in connection with the transaction of public business and preserved or appropriate for preservation by that agency or its legitimate successor as evidence of the organization, functions, policies, decisions, procedures, operations, or other activities of the Government or because of the informational value of data in them.

Resource Management Plan - A Resource Management Plan contains adopted management standards and strategies for a specific resource. Generally, resources subject to Resource Management Plans are not confined to geographically discrete areas and they are not static (i.e., their characteristics and conditions often vary in time and/or location across the Site).

Sensitive Species (State) - A wildlife species native to the state of Washington that are vulnerable or declining and are likely to become endangered or threatened throughout significant portions of their ranges within the state without cooperative management or the removal of threats.

Site Resources - The biological, natural, and cultural resources of a particular area or site.

Threatened Species (Federal) - A wildlife species that is likely to become endangered throughout all or a significant portion of its range in the foreseeable future.

Threatened Species (State) - A wildlife species native to the state of Washington that is likely to become endangered in the foreseeable future throughout significant portions of their ranges within the state without cooperative management or the removal.

APPENDIX A

THE HANFORD SITE IN 2035

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APPENDIX A

THE HANFORD SITE IN 2035

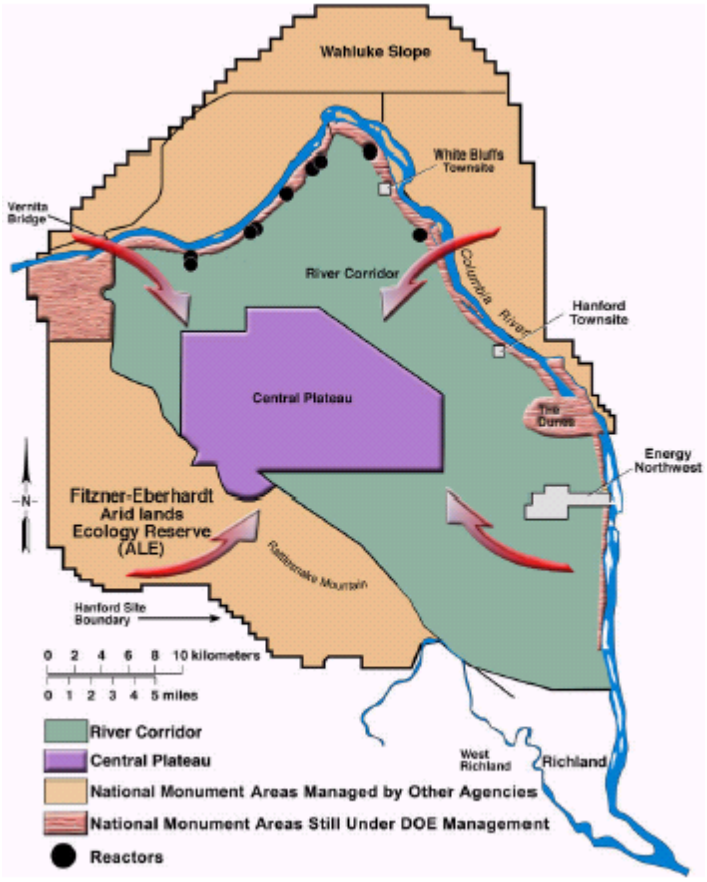
This appendix is an excerpt from the Performance Management Plan for the Accelerated Cleanup of the Hanford Site (PMP) (DOE/RL-2002-47, Rev. D, August 2002).

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

The "shrinking" of active Hanford cleanup operations to the Central Plateau is depicted in Figure A-1.

Figure A-1. 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 Tri-Party Agreement 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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