Hanford Site Development Plan

RECEIVED
OCT 18 1993
OSTI

Approved:

John D. Wagoner, Manager
U.S. Department of Energy,
Richland Operations Office

Prepared for the U.S. Department
of Energy, Richland Operations Office
by Westinghouse Hanford Company,
Site Planning

Principal Author:
H.B. Hathaway
Westinghouse Hanford Company

Contributing Authors:
K.S. Daly
C.A. Rinne
S.W. Seiler
Westinghouse Hanford Company

Date Published
May 1993

United States
Department of Energy

P.O. Box 550
Richland, Washington 99352

MASTER

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

Introduction

The Hanford Site Development Plan (HSDP) provides an overview of land use, infrastructure, and facility requirements to support U.S. Department of Energy (DOE) programs at the Hanford Site. The HSDP's primary purpose is to inform senior managers and interested parties of development activities and issues that require a commitment of resources to support the Hanford Site. The HSDP provides an existing and future land use plan for the Hanford Site. The HSDP is updated annually in accordance with DOE Order 4320.1B, *Site Development Planning*, to reflect the mission and overall site development process. Further details about Hanford Site development are defined in individual area development plans.

Background. Current land use and development at the Hanford Site are the result of more than 50 years of defense production, energy research and development, waste management, and application of environmental and biological sciences. Established in 1943, the Hanford Site is one of three original Manhattan Project sites involved in the development of atomic weapons.

In 1943, the U.S. Government acquired 1,605 square kilometers (620 square miles) of publicly and privately owned land. Control zone leases held between 1948 and 1958 increased the Hanford Site to 2,589 square kilometers (1,000 square miles). During the years, several parcels of land have been released. The illustration on page *ii* depicts these site boundary changes. Presently, the Hanford Site encompasses 1,450 square kilometers (560 square miles) and is operated by the U.S. Department of Energy, Richland Operations Office (RL). A 1991 satellite image of the Hanford Site is shown on page *iii*.

The change from defense production to environmental restoration and remediation has significant implications for future land, infrastructure, and facility requirements. The cleanup mission will require development of new technologies. Existing facilities designed to support previous missions will require upgrades or replacements to support the cleanup mission. The new mission will also drive the development of several new work centers across the Hanford Site, such as the Solid Waste Operations Complex and Tank Waste Remediation System facilities in the 200 areas and the Environmental and Molecular Sciences Laboratory in the 300 Area. Projected developments will require upgrades or replacements to several existing infrastructure systems (e.g., roads and electrical), as well as the extension and addition of new services and support facilities (e.g., offices and warehouses).

Since fiscal year (FY) 1989, employment at the Hanford Site has increased to support the cleanup and expanded research and development missions. The increase in personnel has created critical needs for office facilities. Current projections for FYs 1993 through 1997 predict continued employment growth.

The Hanford B Reactor was the world's first plutonium production reactor in support of the Manhattan Project. The reactor is on the National Register of Historic Places.

Contents

Hanford Site Overview	1
Program Projections.....	2
Resource Requirements	3
Primary Mission	
Environmental Restoration	
Tank Waste Remediation System	
Solid and Liquid Waste	
Facility Transition	
Advanced Reactor (Nondefense)	
Site Support	
Science and Technology	
Multiprogram Laboratory	

Special Initiatives	
Landlord and General Site Support	
Master Plan	9
Land	
Infrastructure	
Land Use Maps	
Major Construction Projects	15
Special Planning Considerations	16
Appendix A	17
Glossary	
Land use Categories	
References

This satellite image is copyrighted by ©CNES (1991) SPOT[®] imagery produced under a SPOT Image Corporation license. SPOT is a French Acronym for "satellite observation of the Earth." Using

advanced computers, data taken from the French SPOT satellite is processed into a printed image.

Hanford Site Overview

The Hanford shared vision. Together we are building a clean, accessible, and healthy environment which is a part of a prospering and diversified community. We are reaching beyond our past achievements to continue a tradition of excellence in scientific and technological accomplishments. We are a resource that nations turn to for solutions to environmental challenges.

Hanford Site Mission. The primary mission at the Hanford Site is environmental restoration and remediation of the site (commonly referred to as "cleanup"). This includes the relationship of the cleanup mission to other programs and continual waste management and disposal activities. The Hanford Site will continue to be a national resource for scientific, technical, and engineering capabilities and innovation with a special focus on environmental cleanup processes and technologies.

Employment. The Hanford Site is operated by the U.S. Department of Energy, Richland Operations Office (RL). Four prime contractors perform operating and servicing functions at the Hanford Site. The DOE is engaged in deliberations and procedures regarding a potential fifth contractor to manage site remediation activities, known as the Environmental Remediation Management Contractor (ERMC).

- *Battelle Memorial Institute* (Battelle) operates the Pacific Northwest Laboratory (PNL), one of five multiprogram energy research laboratories for DOE, and the research and development center for the Hanford Site.
- *Hanford Environmental Health Foundation* (HEHF) provides occupational health and environmental monitoring services.
- *Kaiser Engineers Hanford* (KEH) performs architect-engineer and construction services.
- *Westinghouse Hanford Company* (WHC) (with Boeing Computer Services, Richland, as subcontractor) conducts engineering, operation, and computer services.

Sitewide employment at the Hanford Site has increased to support the new cleanup mission. Since FY 1989, 3,400 new jobs have been filled across the site.

More than 16,000 people were employed at the end of FY 1992. Current projections for FYs 1993 through 1997 indicate continued growth, with a peak sitewide employment of 18,000 during the next 10 years and then a downward trend as the cleanup mission progresses (WHC 1993).

Fiscal Year 1993 Funding Summary

(as of January 20, 1993)

Programs	\$ millions
Environmental Restoration and Waste Management	1,421
Materials Production	41
Nuclear Energy Research and Development	3
Other Programs	265
Total	1,730

Regional Information. The Hanford Site provides an exceptional range of opportunities and resources for scientists and engineers both on and off the site. RL encourages optimal use of products and processes developed through research programs by transferring technology to industries, universities, and other government agencies. Also, economic transition is encouraged by RL, so the community has a sound economic base at the end of the cleanup mission.

The population within an 80-kilometer (50-mile) radius of the Hanford Site was estimated at approximately 413,400 in the 1990 census. The site draws most of its professional and technical service employees from the Richland, Kennewick, and Pasco (Tri-Cities) metropolitan statistical area (MSA) southeast of the site. In the 1990 census, the Tri-Cities MSA population was 150,000 with a workforce of 74,600. The Tri-Cities serves as a regional commercial and industrial center for both southeastern Washington State and northeastern Oregon State. Its location near major road, air, rail, and waterway networks allows for economical import and export of materials and interaction of people from across the United States and the world.

Outside of the Tri-Cities MSA, the population surrounding the Hanford Site is sparse, consisting primarily of agricultural communities. Members of the surrounding communities are more familiar with nuclear energy and radioactive

Historical and projected total employment for DOE and Hanford Site contractors as of February 1993.

materials than are most members of the general public. Local communities are generally supportive of Hanford Site activities. On a regional level, general knowledge of nuclear energy and activities at the Hanford Site is limited but growing. Regional support is low for accepting waste generated offsite but tends to be high for environmental cleanup, research, and environmental compliance.

Hanford Site Description. The Hanford Site is located in the southeast portion of Washington State. The site occupies an area of 1,450 square kilometers (560 square miles) with the Columbia River flowing through and adjacent to it. The Hanford Site is relatively flat, seismically quiet, and semi-arid with a mild climate. It is owned by the U.S. Government and operated by RL. Small portions of the Hanford Site are owned, leased, or administered by other governmental agencies. The Tri-Cities is located directly downstream from the Hanford Site near the confluences of the Yakima, Snake, and Columbia rivers.

Hanford Site facilities and activities are consolidated within "operating areas" that occupy about 6% of the Hanford Site's total available area. A general description of these areas is presented below:

- **100 Areas**—N Reactor and eight other deactivated plutonium production reactors used in previous nuclear programs (This includes waste disposal sites associated with the operation of these reactors.)
- **200 Areas**—Chemical processing and waste management storage, applied technology, and disposal
- **300 Area**—Multiprogram laboratories for research and development
- **400 Area**—Fast Flux Test Facility (FFTF) and related support facilities
- **700 Area**—Administrative center for government employees
- **1100 Area**—Shipping and receiving and road, rail, and vehicle maintenance
- **3000 Area**—Engineering and construction support facilities.

The remainder of the Hanford Site is known as the 600 Area, which includes all property within the boundaries of the Hanford Site.

Facility Condition. Onsite programmatic and general-purpose facilities total approximately 799,337 square meters (8,604,000 square feet) of space. Fifty-one percent (407,658 square meters [4,388,000 square feet]) is general-purpose space, such as office, support laboratory, shop, warehouse, and other support facilities. The remaining 391,679 square meters (4,216,000 square feet) of space are programmatic

Age of Government-owned general purpose space. Percentages are based on square footage.

facilities such as processing, evaporator, filter, waste recovery, waste treatment, waste storage facilities, and research and development laboratories. More than half of the general-purpose and programmatic facilities are older than 30 years. Facilities designed to perform previous missions are being evaluated for reuse in the cleanup mission. Some facilities are inadequate to meet today's cleanup challenge.

Program Projections

Successful site development planning requires foresight and flexibility. The challenge is to provide facilities that accommodate program requirements within the context of environmental, safety, health, and budget constraints. The Hanford Integrated Planning Process (HIPP) began in October 1990 to understand the various directions cleanup could take and provide technical guidance. The HIPP integrates planning and budgeting documents, such as multi-year program plans and the Five-Year Plan, that outlines the requirements and priority of activities across the site. The overall summary-level document is the Hanford Mission Plan (HMP). The HMP provides mission-level direction for the more detailed integrated planning efforts that are required to achieve cleanup of the site. Integrating the Site Development Planning Process with this activity has provided a critical link to ensure that land, facilities, and support systems are available when needed. This linkage is a proactive approach to accom-

The Site Development Planning Process and the Hanford Integrated Planning Process constantly interact. This approach ensures that key relationships and resources are fully considered when making programmatic decisions. Actions taken as a result of these processes require evaluation under the NEPA.

moderate changing programmatic requirements. This is evident through the Hanford Integrated Infrastructure Planning Process which was initiated in September 1992 to provide greater sitewide participation and input to the site infrastructure planning and decision making processes. This approach ensures the integration of mission, program, plant, facility, and building needs to provide infrastructure support.

Integrated throughout the HIPP and the Hanford Site Development Planning Process is the review of the National Environmental Policy Act (NEPA) requirements. While there has been no sitewide NEPA review of the Hanford Site, there have been a number of environmental assessments and environmental impact statements (EIS) done by the facility or program. These, plus the ongoing Environmental Restoration and Waste Management and Defense Program programmatic EIS, provide support to the planning process. It is anticipated that preparation of a sitewide EIS will be initiated in the mid-1990s that will consider all the current and anticipated DOE actions on the site.

Primary Mission. The Hanford Site's primary mission is to clean up the Hanford Site and eliminate potential risks to the public and workforce. This includes the relationship of the mission to other programs and continual waste management and disposal activities. Many applicable regulations direct or control the cleanup of the Hanford Site. The *Hanford Federal Facility Agreement and Consent Order*, also referred to as the Tri-Party Agreement, is particularly important because it includes specific milestones that drive a number of site cleanup activities. The Tri-Party Agreement is a legal agreement between the Washington State Department of Ecology, the U.S. Environmental Protection Agency (EPA), and DOE. The primary purpose of the Tri-Party Agreement is to provide a framework for coordination

among these agencies to ensure compliance with the *Resource Conservation and Recovery Act of 1976 (RCRA)*, and the *Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA)*. The Tri-Party Agreement outlines a program to clean up much of the Hanford Site.

Not specifically covered under the Tri-Party Agreement is the decontamination and decommissioning of existing facilities, such as the removal of eight retired plutonium production reactors (100 Area facilities) along the Hanford Reach of the Columbia River. The eight surplus reactors are to be dismantled and disposed of in the 200 areas (DOE/EIS 1992). The first reactor won't be dismantled until detailed engineering work is completed. The waste materials generated by the process will be treated and disposed of in accordance with appropriate federal, state, and local regulations.

H Reactor is one of the eight surplus reactors to be dismantled. 105-H began operating in October 1949 and was shut down in April 1965. The reactors (B, C, D, DR, F, H, KE, and KW) were built between 1943 and 1955.

Resource Requirements

The overall Hanford Site mission is divided into key programs as summarized below (DOE/RI, 1993). The major future facility requirements associated with each program are also provided. The impacts to land and infrastructure from their activities are identified in the Master Plan section.

Environmental Restoration. The Environmental Restoration Program performs the following functions:

- Manage and remediate environmental contamination at the Hanford Site, including contaminated soils, contaminated groundwater, and solid waste contained in past-practice waste sites.

In 1991 employees unearthed rusty drums in Burial Ground 618-9. More than 120 hexone drums were buried in the trench 35 years ago. This first expedited remedial response action was completed in October 1992.

- Clean single-shell tank (SST) structures and dispose residual waste materials on conclusion of the SST waste disposal.
- Deactivate any facilities operated during the cleanup.
- Provide decontamination and decommissioning (D&D) of surplus facilities.
- Dispose of retrieved waste to support closure of past-practice sites and solid waste generated by Environmental Restoration operations.
- Conduct scheduled environmental, industrial and radiological surveillance, and maintenance of surplus facilities before decommissioning to protect the public's and workers' health, safety, and welfare.

Work continues to characterize and remediate more than 1,100 inactive hazardous and mixed waste sites and to D&D about 96 surplus facilities.

Several key Environmental Restoration Program projects will continue to be defined as the site is cleaned up. It is expected that new projects will require use of significant parcels of land and extension of infrastructure services to support restoration activities. The following is a key construction project in support of this program:

- *Environmental Restoration Storage and Disposal Facility (ERSDF) (200 Areas)* — Provide a 6-square-mile site for the safe storage and permanent disposal of the waste (e.g., contaminated soil removed from the 100 and 300 areas) generated during remediation. The ERSDF will include support facilities, roads, rail, buffer zones and other operational requirements.

Tank Waste Remediation System. The Tank Waste Remediation System program performs the following functions:

- Manage tank waste in an environmentally sound, safe and cost-effective manner.
- Retrieve single-shell tank and double-shell tank waste for immobilization and disposal.
- Immobilize high-level tank waste into borosilicate glass for shipment to offsite repository.
- Immobilize low-level tank waste fraction for onsite disposal.

The Hanford Site's top environmental management issue is the safe operation and eventual remediation of mixed waste storage tanks (containing both radioactive and hazard-

A 64-foot tall, 19,000-pound mixer pump is being tested at the FFTF's maintenance and storage facility for installation in Tank 101-SY. Once in place further testing will be done to determine if the pump can create a continuous release of gases with the least amount of agitation of the waste. The continuous release of gas will reduce the likelihood of gas venting in potentially explosive concentrations.

Waste tank workers use an auger to sample the surface of waste stored in Tank 101-SY before taking a top-to-bottom sample of the waste. The successful installation of video cameras inside the tank provides valuable information needed for scientists to determine the best remediation method for Tank 101-SY.

ous waste). Approximately 61 million gallons of mixed waste are stored in 149 single-shell tanks and 28 double-shell tanks. Technology is being developed and options are being considered for disposal of all tank waste. Material stored as tank waste is not considered to be in a suitable form for disposal without treatment (conversion to glass or grout). Media attention has been focused on several tanks, specifically Tank 241-SY-101 (referred to as Tank 101-SY), which periodically vents gases, including hydrogen, that are generated by its stored waste. Various methods are being used to determine the physical and chemical properties of tank wastes (e.g., composition, viscosity, reactivity) and their changes over time.

The following are key construction projects in support of this Program:

- **Multipurpose Processing and Storage Complex (MPSC) (200 Areas)**—Provide interim storage for the irradiated nuclear fuel and other radioactive materials at the Hanford Site. This includes Hanford reactor fuels, cesium/strontium capsules, plutonium residuals, and canisters of vitrified high-level waste. Also included in the MPSC is a Storage Preparation and Shipping Facility, which will process failed HWVP melters, mixed waste failed equipment and tank debris.

- **Initial Pretreatment Module (200 Areas)**—The primary purpose is to resolve tank safety issues by removing organics, ferrocyanide, and cesium.
- **Extensive Separations Module**—A facility in the planning stages that would provide additional separations to reduce waste volumes and reduce radionuclide and hazardous materials in onsite disposal waste.
- **Hanford Waste Vitrification Plant (HWVP) (200 Areas)**—Receive and vitrify the high-level pretreated waste streams.
- **Grout Disposal Vaults (200 Areas)**—Permanently dispose of low-level waste grouted at the Grout Treatment Facility (GTF).
- **Multi-function Waste Tank Facility (200 Areas)**—Provide additional double-shell tanks to resolve safety issues, and expand capacity.
- **Waste Transfer Systems (200 Areas)**—Provide encased pipelines to transfer radioactive liquid wastes for grout, pretreatment, and vitrification processes.
- **Tank Farms Operations Facilities (200 Areas)**—Provide access control, change-room, equipment storage, computer, alarm, data display, and control facilities.
- **Tank Farm Operation Support Facilities (200 Areas)**—Provide office and shop space.

Solid and Liquid Waste. The Solid Waste Program and the Liquid Waste and Decontamination Service Program provide the following functions:

- Operate existing and new facilities in compliance with current standards and environmental regulations.
- Treat, store, and dispose of a wide variety of solid material types consisting of multiple radioactive and hazardous waste classes.

High-level radioactive waste will be made into glass and poured into stainless-steel canisters at the Hanford Waste Vitrification Plant. Construction of the plant started in April 1992. The canisters will be stored onsite until they can be shipped to a national repository.

- Manage current future site liquid effluent streams, which include contaminated and potentially contaminated liquids.
- Provide centralized decontamination and repair services for contaminated equipment and liquid waste transfer services.

Current storage capacity for solid waste is located in the Solid Waste Operations Complex and is composed of several facilities. Facilities, such as burial grounds, trenches, and buildings are used to store waste in compliance with RCRA. The following are key construction projects in support of these programs:

- *T Plant Upgrades (200 Areas)*—Provide secondary containment and leak detection to T Plant and upgrade T Plant's ventilation system in support of high-level decontamination operation.
- *340 Facility Upgrades (300 Area)*—Replace facility systems in support of applicable state and federal regulations for compliance of sampling, storing, and transferring of 300 Area liquid waste and effluents.
- *Waste Receiving and Processing Facilities (WRAP), Modules 1, 2A, and 2B (200 Areas)*—Process retrievably stored and newly generated transuranic waste and mixed wastes for permanent disposal.
- *Solid Waste Thermal Treatment Facility (200 Areas)*—Provide high-temperature treatment and disposal of mixed waste. Presently alternatives are also being considered for offsite treatment.
- *Enhanced Radioactive and Mixed Waste Storage Facility, Phase V (200 Areas)*—Provide inventory control, material handling, and storage in support of the Solid Waste Processing and Treatment Operations. This project will also provide operations support and maintenance facilities and infrastructure upgrades to support the Solid Waste Operations Complex.

Once completed, the Solid Waste Operations Complex will comprise several facilities related to solid waste operations. The complex will receive solid waste for treatment and packaging before disposal.

PUREX began operating in 1956 as a third-generation chemical separations plant, providing the essential link in obtaining weapons-grade plutonium. Plans are being developed to clean up PUREX, which has numerous radiation zones, miles of piping, and many types of chemicals and dangerous wastes.

- *Treated Effluent Disposal Facilities (200 and 300 Areas)*—Construct collection, storage, treatment, and disposal facilities for the process effluent streams.
- *Radioactive Mixed Waste Disposal Facility (200 Areas)*—Provide a RCRA-compliant landfill for the disposal of solid low-level mixed waste.
- *Solid Waste Retrieval Facility, Phases I and II (200 Areas)*—Retrieve transuranic waste from interim storage in the burial grounds.

Facility Transition. The Facility Transition Program performs the following functions:

- Manage the former defense production and nuclear energy facilities on the Hanford Site in a safe, secure, and environmentally sound manner.
- Store, manage, and dispose of the inventory of nuclear materials associated with the former defense nuclear facilities.

The N Reactor, shut down in 1987, was the last operating production reactor on the Hanford Site. An environmental impact statement (EIS) will be prepared to assess interim storage alternatives for the irradiated N Reactor fuel. Storage of the irradiated N Reactor fuel in the 100K Area basins must continue until the EIS Record of Decision is fully implemented.

In December 1992, DOE ordered the permanent shutdown of the Plutonium-Uranium Extraction (PUREX) Plant. This was the beginning of a large-scale environmental cleanup effort to prepare the PUREX Plant for safe and efficient decontamination and decommissioning work. A concept is being established for a Project Management Plan

that could provide a 3-year savings (mitigating nonsafety issues) over the normal shutdown scenarios. It is hoped that this approach will serve as a model for the site and the nation.

The following is a key construction project in support of this program:

- *KE/KW Facility Life Extension (100K Area)*—Provide upgrades for seismic, fire protection and security to the 100KE and KW fuel storage basins. This is required for the continued storage of irradiated N Reactor fuel in the 100K Area basins.

Advanced Reactor (Nondefense). The Advanced Reactor (Nondefense) Program performs the following functions:

- Maintain the Fast-Flux Test Facility (FFTF).
- Manage nuclear energy facilities.
- Manage a broad spectrum of United States and international test programs.

In April 1992, DOE placed the FFTF in a standby mode for possible future operation no earlier than 1996. Plans are being considered by DOE to place the facility in "cold" standby status.

The following is a key activity on hold in support of this program:

- *Fuel Assembly Area in the Fuels and Materials Examination Facility (FMEF) (400 Area)*—Perform various upgrade and modifications for the purpose of manufacturing fuel for FFTF.

Site Support. The Site Support Program performs the following functions:

- Ensure analytical laboratory capabilities to support site cleanup.
- Provide environmental monitoring and support.

Additional laboratories are being pursued to reduce the overload on existing laboratories to support waste characterization.

The following are two key construction projects in support of this program:

The Environmental and Molecular Sciences Laboratory (EMSL) will be a state-of-the-art DOE laboratory. The EMSL will provide capabilities for fundamental studies of molecular processes in the environment and for developing new technologies to meet DOE's environmental and waste management goals.

- *Waste Sampling and Characterization Facility (200 Areas)*—Provide analytical capabilities to analyze hazardous waste samples including those containing low levels of radioactivity.
- *Laboratory and support facilities upgrades (200 and 300 Areas)*—Increase analytical laboratory capabilities in existing facilities.

Science and Technology. The Science and Technology Research and Support Program and the Technology Development National Program collectively provide the following functions:

- Respond to environmental restoration and waste management priorities of the Hanford Site with new technological developments.
- Provide an active approach that integrates science and technology activities with Hanford Site environmental and waste management activities.
- Integrate science and technology activities among all Hanford Site contractors through the Hanford Integrated Planning Process.
- Participate in all relevant activities of the DOE Environmental Restoration and Waste Management Office of Technology Development's national research, design, and development technology and engineering program.

The following are two key construction projects in support of these programs:

- *Environmental and Molecular Sciences Laboratory (EMSL) (300 Area)*—The EMSL and its associated research program is to provide quality research capability to advance technologies in support of the DOE's long-term mission in environmental restoration and waste management.
- *Thermal Treatment Testing Facility (TTTF) (300 Area)*—Provide for pilot-scale demonstration testing and evaluation of thermal treatment technologies of mixed waste. The facility will also provide treatment of Pacific Northwest Laboratory's (PNL's) generated hazardous waste.

Multiprogram Laboratory. The Multiprogram Laboratory Program performs the following functions:

- Provide scientific and technological advances to meet national needs of the Environmental Restoration and Waste Management Programs, including those at the Hanford Site.
- Conduct scientific research and rapidly develop and deploy technology to meet other national needs.

The PNL is a national multiprogram laboratory, providing highly trained staff using state-of-the-art equipment. The PNL has a broad array of multidisciplinary research and development capabilities focused on enhancing environmental quality, protecting human health, increasing energy

supply and efficiency, and modernizing the defense complex.

The following are key construction projects in support of this Program:

- *Environmental, Safety, and Health Research Complex (300 Area)*—Expand instrument development and calibration in support of environmental restoration, environmental compliance, and worker safety.
- *Advanced Process Engineering Laboratory (APEL) (300 Area)*—Develop and test technologies for tank waste retrieval, pretreatment/separations, conditioning and final processing to an acceptable final waste form.
- *National Security Technology Center (NSTC) (300 Area)*—Analyze and process classified data in support of national security, arms control, and nonproliferation activities.

Special Initiatives. The Special Initiatives Program supports programmatic requests for services to other DOE offices and other organizations and agencies. In addition this program will perform the following functions:

- Support priority DOE initiatives.
- Conduct special research programs.
- Seek new activities for the Hanford Site.
- Produce specialty materials.
- Provide consulting support to other sites.
- Explore private sector participation.

The following are proposed special initiatives that could impact the land and infrastructure:

- Continued development and testing of technology for advanced space applications, such as space power generation and distribution, materials for space applications, and nuclear propulsion.
- *Specialty isotope production and preparation (400 Area)*—Produce and sell isotopes to government, commercial, and medical customers around the world. Seven DOE sites are involved in this project. Currently, the Hanford Site provides several key radioisotope products.
- *Laser Interferometer Gravitational-Wave Observatory (LIGO)*—In February of 1992, the Hanford Site was selected by the National Science Foundation as a preferred site for their LIGO. The facility will detect cosmic gravitational waves for scientific research. Construction of the facility will begin by the spring of 1994 and will consist of two optical tube arms arrayed in an "L" shape.
- *Land Lease Activities*—The DOE leases Hanford Site property to the Washington Public Power Supply System for commercial power generation. Washington State leases 1,000 acres between the 200 areas for mission-related development. Currently, U.S. Ecology subleases a piece of this land for commercial low-level radioactive waste disposal.

The Laser Interferometer Gravitational-Wave Observatory (LIGO) will consist of two widely separated installations within the continental United States, operated in unison as a single observatory. It will be open for use by the national and world scientific communities and will become part of a planned worldwide network of gravitational-wave observatories.

The Hanford Site has also been proposed as a potential site for several other advanced scientific and technical facilities. These and other potential projects that could be located at the Hanford Site are listed below.

- *Hazardous Materials Management and Emergency Response (HAMMER) Training Center*—Provide "hands-on" training for hazardous materials response personnel. As currently envisioned, HAMMER will satisfy both federal and state laws with respect to hazardous material training.
- *Superconducting Magnetic Energy Storage/Engineering Test Model (SMES/ETM)*—Demonstrate the ability to provide reliable, highly efficient storage of electrical power. This research project is a joint effort between the Bonneville Power Administration (BPA) and RL.
- *Advanced Liquid Metal Reactor (ALMR) Prototype Test Facility*—This project proposes an ALMR prototype power plant that may improve safety margins, licensing, construction, operations, maintenance, and cost of nuclear power generation for commercial applications in the next century.
- *Nuclear Weapons Complex Reconfiguration Site (NWCRC)*—Hanford is one of five DOE sites being evaluated as a possible location for all or part of the reconfigured nuclear weapons complex. This involves consolidating and considerably downsizing activities now located at the Rocky Flats (Colorado), Oak Ridge (Tennessee), and Pantex (Texas) DOE sites.
- *Regional Alpha Laboratory*—Provide transuranic sample analysis capabilities for DOE facilities in the western United States.

Landlord and General Site Support. The Landlord and General Site Support Programs provide the facilities, infrastructure and services that support all activities on the Hanford Site. These needs are addressed in the Master Plan Section.

The Hanford Site's infrastructure serves as the backbone for all Hanford Site activities. The cleanup mission is placing new requirements on the infrastructure. In the 1980s, some upgrades were completed to restore the integrity of the 1940s infrastructure. Those infrastructure systems that were not upgraded are in fair to poor condition and will require upgrades or replacements to support the cleanup mission.

Capital and expense funding supports maintenance and upgrade activities necessary to keep the infrastructure systems in adequate operating condition. Similarly, a progressive replacement and demolition program is required to address near-critical aging infrastructure issues.

Master Plan

The Master Plan outlines the relationship of the land and infrastructure as needed by Hanford Site missions. The objective is to develop and maintain the site to accommodate ongoing and changing program requirements. This objective is further defined by the list of goals provided in this section.

The programs will modify existing structures and drive the development of several new work centers across the site, such as the Solid Waste Operations Complex and Tank Waste Remediation System facilities in the 200 areas and new research and development facilities in the 300 Area (e.g. the Environmental and Molecular Sciences Laboratory). Requirements for facilities and land continue to evolve that will require significant extensions and upgrades to infrastructure systems to serve them. Planning and funding will be required to meet these needs. The construction projects listed on page 15 highlight current Hanford Site major needs. They are listed by funded and budgeted projects as supported by DOE activity data sheets (ADSs) and planned projects before the development of an ADS.

This Master Plan provides two land use maps. The Existing Land Use Map shows today's land uses. The Future Land Use Map represents DOE's current vision of the site, when the Tri-Party Agreement commitments have been met and some potential new uses have been developed that further the current mission of the Hanford Site. These future land

uses consider existing and potential Hanford missions and assumptions (DOE/RL 1993) and recommendations made by the Hanford Future Site Uses Working Group (Drummond 1992). It is important to realize that these maps represent the maximum amount of land that is expected to be used in each of these land use categories. Efforts will be made to minimize the actual amount of land used for waste sites and maximize the amount available for other productive uses. This map will be updated annually to reflect the Hanford Remedial Action/Environmental Impact Statement, Tank Waste Remediation System/Environmental Impact Statement, other National Environmental Policy Act, CERCLA, regulatory decision documents, mission changes, and other sources, as appropriate. Appendix A defines the land use categories.

Shown on the Future Land Use Map, growth in "waste operations" in the 200 areas reflects land dedicated to a potential cleanup scenario where sitewide wastes are collected and stored in a central location for exclusive use as a waste disposal area. This includes the relocation of waste sites and associated structures, such as the 100 Area facilities (DOE/EIS 1992). Growth in "research and development" in the southern portion of the site reflects land dedicated to current and potential expanded science and technology applications in support of cleanup and other programs (DOE/RL 1991).

A concerted effort is being made to include site neighbors, Native American Tribal Governments, special stakeholders, and the general public in the overall site development decision-making process.

Land. The land at the Hanford Site is a prime resource for ongoing and future activities. Managing this asset in accordance with long-range regional and national needs is critical in order to preserve the natural resources and improvements of the site.

Land Goals. Guidelines for land development are presented below:

- **Long-term**—Develop new scientific and technological uses.
- **Short-term**—Pursue interim uses while scientific and technological uses evolve.
- Release land from DOE if not required.
- Minimize disturbance of clean land.
- Consolidate Area support activities to improve productivity and maximize flexibility.
- Develop the site in accordance with applicable environmental, cultural, safety, and health requirements.

Primary Land Issues. The primary land issues are presented below:

- *How clean is clean*—The Hanford Remedial Actions/Environmental Impact Statement (HRA/EIS) is being initiated to develop an overall cleanup strategy for the Hanford Site. A working group, composed of federal, tribal, state, local governments, and special interest groups interested in cleanup, especially as it relates to potential future usability of the site, provided substantive public input into cleanup planning (Drummond 1992). Once in place, the HRA/EIS Record of Decision (ROD) will provide a basis for ongoing cleanup and land use planning associated with the cleanup activities. The Working Group's findings and recommendations will also be considered in other site planning processes and decisions.
- *Tank Waste Remediation System/EIS*—The Tank Waste Remediation System/EIS (TWRS/EIS) is being initiated for tank waste disposal activities. This EIS with the Hanford Defense Waste EIS (DOE/EIS 1987) provides the basis for high-level waste disposal of tank waste and cesium/strontium capsules.
- *Future Site Uses*—For planning purposes, until the ROD from the HRA/EIS is complete, the 200 areas are projected to be used exclusively for the collection of site waste materials and associated activities. All other areas across the site will eventually be made available for other potential future uses. The HRA/EIS will focus on cleanup to an extent that allows different broad potential uses (i.e., unrestricted, restricted, and exclusive) of major geographic areas of the Hanford Site. The specific level of cleanup of the surface, subsurface, and groundwater in these areas is also a factor in identifying potential uses. The level of cleanup will be determined through the appropriate CERCLA and RCRA decision processes.
- *Hanford Reach EIS*—In 1988, Congress enacted a comprehensive river conservation study of the Hanford Reach of the Columbia River. The Hanford Reach is a free-flowing segment (51 river miles) of the Columbia River, stretching from 1 mile below the Priest Rapids Dam downstream to the McNary Pool at Richland, Washington (approximately 1.6 kilometers [1 mile] north of the 300 Area). This stretch of river has never been impounded and possesses significant archeological and cultural resources. The purpose of the EIS is to recommend alternatives to protect the outstanding resources of the reach, which would most likely limit development along the Columbia River (NPS 1992).
- *Release of land*—Now that the cleanup mission is progressing at Hanford, land no longer required for other missions or needs will be released to others in accordance

with applicable laws and regulations. Expedited cleanup actions are in progress in preparation for releasing portions of the site. The remainder of the site will continue to be under federal control for the foreseeable future.

- *Highest and best use of the land*—The Hanford Site provides an economic base for the region. In the long term, as the regional economy diversifies, the Hanford Site will continue to provide a scientific and technological resource for continued growth. Also, land at the Hanford Site will continue to be designated for specific purposes, such as the Solid Waste Operations Complex and Tank Waste Remediation System facilities.

Infrastructure. The average design life of most facility and infrastructure systems is 30 years. Many of the Hanford Site's existing systems are at least that old today. The development, upgrade, and maintenance of crucial facilities and infrastructure systems will be a primary need as cleanup progresses and new uses are identified.

Primary Infrastructure Issues. Needs for major infrastructure systems in support of the missions are summarized in alphabetical order. Where applicable, the results of the

Infrastructure Goals. Guidelines for infrastructure development are presented below:

- Ensure regulatory compliance.
- Deliver infrastructure to meet program/mission needs.
- Provide infrastructure economically.
- Leave diversification value at end of mission.
- Concentrate service locations by grouping activities.
- Upgrade or demolish inadequate and underused facilities.
- Promote energy-efficient facilities.
- Maintain appropriate security measures.
- Maintain facilities and equipment as economically and safely as possible.
- Explore private sector participation.

Integrated Infrastructure Planning Process to forecast infrastructure needs was included. More detailed descriptions of infrastructure systems are provided in the *Hanford Site Infrastructure Plan* (DOE/RL 1989) and individual area development plans.

- *Analytical Laboratories*—The Hanford Site analytical laboratories are in transition to support the Hanford Site cleanup mission. Upgrades to the capabilities and capacities of Hanford

Site laboratories are necessary to support required waste characterization. Analytical laboratory services are needed to analyze low-level radioactive, mixed, and hazardous waste samples. This service will be provided by constructing the Waste Sampling and Characterization Facility and by other supporting laboratories. Upgrades and expansions to existing facilities will provide necessary capability to analyze high-level waste, tank cores, grout process feed, and environmental samples. The expansion of hot cells needed for analysis of highly radioactive mixed waste samples is under way.

- *Electrical*—The Bonneville Power Administration supplies power to the Hanford electrical distribution system and the City of Richland. The Hanford electrical distribution system is used to distribute power to the bulk of the Hanford Site. The City of Richland distributes power to the 700, 1100, and 3000 areas, which constitute approximately 2% of total Hanford Site usage.

A 100 kilovolt electrical upgrade is under way to convert a portion of the electrical distribution system from 13,800 volts to 480 volts. This will eliminate a portion of the 4,160-volt electrical equipment resulting in increased efficiency and safety.

Significant extensions of transmission lines are required to support new facilities and retrieval activities in the 200 areas. Ten power lines in the 200 areas should be converted from 2,400 volts to 13,800 volts for safety and reliability. Electrical loads are expected to increase in the 200 areas by 400 to 500 percent as a result of the Tank Waste Remediation System Program activity.

Major upgrade and replacement of the 300 Area electrical distribution system is under way. Electrical service extensions are also required to accommodate growing research and development programs in this area.

- *Fire*—Fire stations and a fire training facility are required to respond to shifting work locations and to support live-fire training. Hanford Fire Department forces will be redeployed to provide adequate fire protection, ambulance, and hazardous materials response to the work centers on the site. The total number of fire stations will be reduced from 4 to 3. One new replacement facility will be constructed at the 300 Area. The 200 area station will be upgraded and expanded. The fire station serving the 100 areas will be closed when the personnel and facility fire protection requirements allow.

A fire ground training center will be constructed in conjunction with the 300 Area replacement center. New fire water storage tanks and reliable fire alarm and sprinkler systems for many support laboratory and general-purpose buildings are also required in the 300 Area.

The 100K Area facilities used for interim storage of irradiated N Reactor fuel will require upgrades or installation of new fire protection systems to comply with current standards.

- *General-Purpose Facilities*—The Hanford Site is experiencing a critical office space shortage. At the end of FY 1992, the site was approximately 2,500 work stations short of office space to accommodate current needs and to replace inadequate facilities. By FY 1997, projections indicate that a minimum of 2,000 work stations of additional office space will be required in addition to the existing 2,500 work station shortfall. A similar situation exists with other general-purpose facilities such as health service laboratories, warehouses, and change rooms.

- *Laundry*—Laundry and mask-cleaning services will be provided by a commercial offsite company starting in late FY 1993 to replace the existing aging facilities.

- *Process Sewer*—Treated effluent disposal facilities (TEDF) are slated to be constructed in the 200 and 300 areas. These facilities will collect, store, treat, and dispose (process) effluent streams. Normally the 300 Area process sewer will be sent to the City of Richland facilities. The TEDF will be used to treat upset conditions only. Currently, there is a planned project to replace process liquid wastelines in the 300 Area.

- *Railroad*—The railroad network should be upgraded and maintained to support the Hanford cleanup. Offsite shipping of vitrified canisters will require railroad trackage to be maintained to higher standards than today. Additional railroad spur-line construction is required for bulk material transportation, environmental restoration, and future construction activities. Railroad haulage requirements will increase significantly as the cleanup mission progresses. A rail car maintenance facility is also needed for preventive and corrective maintenance.

- *Roads*—The road network north of the Wye Barricade will require major upgrades to support construction, operation, and disposal activities. This need for major improvement comes from the shift in location of major work centers, significant construction and disposal hauling requirements, and the age and load design of existing roads.

The road network in the 300 Area will require upgrades and extensions to accommodate the growing research and development programs. The 1100 Area roads must be upgraded so that traffic circulation can be rerouted to improve ingress and egress and to open land for other activities. Road upgrades are planned for the northern portion of the 3000 Area.

Through the Hanford Integrated Infrastructure Planning Process (HIPP) programmatic activity is evaluated collectively to understand the requirements placed upon the infrastructure sitewide. The HIPP is an ongoing process to validate basic program assumptions and requirements, and forecasts short- and long-term infrastructure requirements.

- **Safeguards and Security**—The emergency response requirements for the site (security, fire, and emergency control) are changing as a result of the cleanup mission. For example, special nuclear materials and classified information have been consolidated into areas that continue to receive traditional high-security protection. Also, the use of automation is increasing to control access to site facilities, such as key cards, cipher locks and biometrics access control units. New facilities will be needed to provide access control and industrial security functions on a sitewide basis.

The Hanford Site Entry Control Center is a planned project for construction near the 300 Area. This project will provide a facility to consolidate the Hanford Site entry control functions. It will be used to help control entry of site employees and business visitors to controlled areas of the site, and to enhance safety onsite.

The Hanford Emergency Alarm Dispatch System is another planned project that will consolidate multiple emergency dispatch centers into one. This project will reduce maintenance and operating costs and replace inadequate dispatch equipment.

- **Sanitary Sewer**—The construction of a central collection and treatment evaporation plant in the 200 areas is being considered to handle sanitary sewer. Anticipated construction of new facilities, increased personnel, changing environmental regulations, and growing concerns about the ability of the current system to handle projected needs drives this requirement. Sanitary wastes are currently disposed of through septic tanks and drain fields.

The sanitary sewer in the 300 Area will require extensions to accommodate growing research and development programs. A 300 Area sanitary sewer tie-in to the City of Richland's system will be completed in 1994.

- **Solid Waste Landfill**—The site nonradioactive solid waste landfill is expected to reach its capacity in FY 1996. The landfill must be expanded, closed, or replaced. Steps are being taken to extend the life of the landfill by reducing input volumes. Alternatives are being considered for offsite disposal of nonradioactive solid waste.

- **Steam**—Steam, or some other energy source, will be required to support existing and new facilities. The 200 areas' steam system requires reliability upgrades. Alternatives are being evaluated for replacing the aging central steam plants and reducing steam requirements in the 200 areas.

The 300 Area steam plant coal handling system must be modified to meet safety requirements.

Natural gas is being considered as an alternative energy source to replace coal-fired steam production in the 200 and 300 areas. The use of gas could provide opportunities for cost savings and a healthier environment.

Other alternatives are being analyzed to decentralize steam production in the 200 and 300 areas.

- **Telecommunication**—Installation of a new sitewide communications network was completed in April and will be operational by July 1993. The new system will provide the basic technology for integrated voice and data capabilities and support to future activities across the site.

- **Water**—The Columbia River is an abundant source of raw water at the Hanford Site. The water distribution systems supplying river water are located at the 100B, 100D, 200 and 300 areas and at the Washington Public Power Supply System. In addition, wells supply water to the 400 Area and a variety of low-use facilities at remote locations. The 700, 1100, and 3000 Areas are supplied with water by the City of Richland.

A new water distribution system is planned to replace the deteriorated system at the 100K Area to support the interim storage of irradiated N Reactor fuel.

A looped water system was installed in the 200 areas in FY 1992. This allowed for repairs and fire protection to take place at the same time. Upgrade of services to support new facilities in the 200 areas will be required. Both the 200 and 300 areas will require increased reservoir capacity, pump upgrades, and expansion of fire mains for fire protection. Options are being considered to supply water from the City of Richland to the southern portion of the 300 Area. This is needed to accommodate growing research and development programs. The existing water system in the northern portion of the 3000 Area is planned to be upgraded to a loop system.

Note: • Refer to construction projects list for callouts (e.g., B1, F3, P2, and S1)

- The land uses identified in this map represent DOE's vision of future land uses based on existing and potential Hanford missions. This map will be updated annually to incorporate decisions made by the Hanford Remedial Action Environmental Impact Statement, other NEPA or regulatory decision documents, mission changes, and other sources as appropriate.

Construction Projects (more than \$10 Million)

Future Land Use Map Ref.	Proj. No.	Project Title	Proposed Fiscal Budget Year
--------------------------------------	--------------	---------------	--------------------------------------

Funded Projects

TANK WASTE REMEDIATION SYSTEM

B-534	242-A Evaporator/Crystallizer Upgrades	1987
F-1 B-595	Hanford Waste Vitrification Plant	1988
F-2 B-714	Grout Disposal Vaults 102-105	1988
W-030	Tank Farm Ventilation Upgrade	1989
F-3 W-125	Grout Disposal Vaults 106-109 (on hold)	1990
W-028	Aging Waste Transfer Lines	1990
W-153	TRUEX Pilot Plant (on hold)	1991
W-151	101-AZ Retrieval System	1992
F-4 W-236A	Multifunction Waste Tank Facility	1993
W-058	Replacement of the Cross Site Transfer System	1993
W-320	Tank 241-C-106 Sluicing	1993

SOLID AND LIQUID WASTE

W-017H	Groundwater Monitoring Well Systems (HEC)	1989
C-031H	PEP Liquid Effluent Treatment Facilities (HEC)	1990
W-105	242-A Evaporator Interim Retention Basins	1990
C-018H	242-A Evaporator/Plutonium-Uranium Extraction (PUREX) Condensate Treatment Facility	1991
F-5 W-026	Waste Receiving & Processing Facility, Module 1	1991
L-045H	300 Area Treated Effluent Disposal Facility	1992
W-049H	200 Area Treated Effluent Disposal Facility	1992
W-087	Radioactive Liquid Waste Line Replacement	1993
W-152	FY 93-96 Groundwater Monitoring Wells	1993

ADVANCED REACTOR (NONDEFENSE)

P-017	Fuel Assembly Area at Fuels and Materials Examination Facility (PMEF) (on hold)	1990
-------	---	------

SITE SUPPORT

F-6 W-011H	Waste Sampling & Characterization Facility (HEC)	1990
W-041H	Environmental Hot Cell Expansion	1991

SCIENCE AND TECHNOLOGY

F-7 D-384	Environmental & Molecular Sciences Laboratory	1991
-----------	---	------

LANDLORD

B-483	Steam System Rehabilitation Phase I	1987
L-035	Safety Compliance Phase I	1990
L-017	Steam Plant Rehabilitation, Phase II	1992
L-047	300 Area Electrical Distribution Conversion & Safety Improvements, Phase II	1992
L-073	Safety Compliance Phase II	1993

Budgeted Projects

TANK WASTE REMEDIATION SYSTEM

L-091	200 East Office Facility	1994
W-211	Initial Tank Retrieval Systems	1994
W-236B	Initial Pretreatment Module	1994
W-246	Grout Disposal Vaults 110-115	1994
W-188	Tank Farms Radiological Support Facilities	1995
B1 W-260	Multi-tank Waste Storage Facility, 200 West Area	1995
B2 W-303	Multipurpose Processing and Storage Complex	1995

SOLID AND LIQUID WASTE

B3 W-100	Waste Receiving & Processing Facility, Module 2 A	1994
B4 W-112	Enhanced Radioactive Mixed Waste Storage Facility, Phase V	1994
B5 W-113	Solid Waste Retrieval Facility, Phase I	1994
W-252	Phase II Liquid Effluent Treatment Facility and Disposal	1995

Future Land Use Map Ref.	Proj. No.	Project Title	Proposed Fiscal Budget Year
--------------------------------------	--------------	---------------	--------------------------------------

B6 W-291	200 Areas Treated Effluent Disposal Facility Best Available Implementation	1993
----------	--	------

LANDLORD

L-070	300 Area Process Sewer Piping System Upgrade	1994
B7 L-102	Primary Highway Route North of the Wye Barricade	1995

MULTIPROGRAM LABORATORY

D-432	Building Replacement II	1995
B8 D-440	National Security Technology Center	1995

Planned Projects

ENVIRONMENTAL RESTORATION

P1 W-296	Environmental Restoration Storage and Disposal Facility	1997
----------	---	------

TANK WASTE REMEDIATION SYSTEM

W-314	Tank Farm Restoration and Safe Operations	1996
W-339	Retrieval Test Facility	1996
W-340	C-106 Manipulator Retrieval System	1996

SOLID AND LIQUID WASTE

C-077	221-T Ventilation Upgrade	1996
W-259	T Plant Secondary Containment and Leak Detection	1996
W-156	Alpha Caisson Retrieval	1997
P2 W-221	Solid Waste Retrieval Facility, Phase II	1997
P3 W-242	Solid Waste Thermal Treatment	1997
P4 W-255	Waste Receiving & Processing Facility, Module 2 B	1997

FACILITY TRANSITION

N-032	105 KE/105 KW Facility Life Extension	1996
N-033	N Springs Stabilization & Liquid Effluent Response Actions	1996

SITE SUPPORT

W-170	222-S Operational Support Facility	1996
-------	------------------------------------	------

MULTIPROGRAM LABORATORY

P5 D-418	Environmental, Safety, & Health Research Complex	1996
P6 D-438	Building Replacement I	1996
D-441	Advance Process Engineering Laboratory	1998
TBD	Laboratory Operations Center	1998
TBD	Building Replacement III	1999

LANDLORD

L-116	200 Area Sanitary Sewer System	1996
P7 L-094	Fire Station & Fire Ground Training Facility	1996
L-XXX	Office/Support Facility	1997
K-004	KEH 200E Office Facility	1997

Special Activities/Initiatives

S1	Superconducting Magnetic Energy Storage/Engineering Test Model (SMES/ETM)	NA
S2	Nuclear Weapons Complex Reconfiguration Site (NWCBS)	NA
S3	Advanced Liquid Metal Reactor (ALMR) Prototype Test Facility	NA
S4	Laser Interferometer Gravitational-Wave Observatory (LIGO)	1992
S5	Hazardous Materials Management and Emergency Response (HAMMER) Training Center	NA
	Regional Alpha Laboratory	NA

Special Planning Considerations

Resource commitments impacts. If required resources are not provided, significant impacts to the cleanup mission will occur. Impacts to other programs are identified in the Master Plan. Specific impacts are defined in activity data sheets, which are part of the Environmental Restoration and Waste Management Five-Year Plan. Impacts are also defined by the Pacific Northwest Laboratory's Institutional Plan.

Capital funding cycle. Line item funding is the only viable source for construction of permanent facilities. The DOE capital funding and construction cycle takes a minimum of 7 years to complete. The length of this cycle makes it impossible to respond to emerging needs, such as the Hanford Site's critical office space shortage, in a timely manner. Capital construction is the only alternative available that will provide continuous amounts of office space onsite. Permanent structures are the preferred alternative for long-term requirements; however, funding levels would have to be increased and the cycle shortened to meet changing mission requirements.

Lease Requirements. The only alternative to capital construction onsite is long-term leasing. Long-term leasing onsite is difficult to implement because of the lack of funding sources to obligate money for the term of the lease (commonly called "scoring"), as required by DOE. Short-term mobile office leases have been used as a solution for providing temporary office space onsite. These short-term

leases are limited to a 2-year term and must be removed when the lease term expires. To meet the office space demands onsite, funding to meet DOE's scoring policy, or a waiver of the policy is required.

All available commercial space in the Tri-Cities is occupied. A few commercial ventures have been successful in constructing new space, but private funding of these facilities is hampered by DOE's short-term lease commitments and cancellation clauses. To encourage private-sector investments, long-term leases, without full-term cost coverage, and alternative cancellation clauses are required.

Lease modular facilities onsite. As an interim solution to capital funding, the acquisition of modular facilities as a personal relocatable property and relief in the leasing scoring policy would solve critical short-term office space needs. The best solution is to use capital funding to purchase the modular office facilities outright. However, with the lack of capital funding, these facilities would be leased for a maximum of 2 years and returned to the vendor as required by DOE rules.

Replacement and demolition of aging facilities. Funding is required to replace and demolish many of the general-purpose buildings constructed during the 1940s and 1950s. Nearly all of these facilities continue to be occupied and require costly safety and maintenance upgrades. Because these buildings are 30 to 50 years old, a number of them are reaching a point of noneconomical repair. An existing program is in place to demolish these buildings. Funding is needed to continue this activity. The unsafe and unreliable operations of these buildings forces their demolition. The impact of not having replacement facilities requires expensive and noncost effective upgrades to maintain occupancy.

Long-Term Engineering Study/Economic Analysis. T Plant is currently the interim central decontamination facility. It is currently being permitted as a "Treatment, Storage, and Disposal" (TSD) unit. An economic evaluation/value engineering study, as directed by RL, will be concluded by the end of FY 1995. This will determine the viability of a T Plant long-term decontamination mission or a new proposal for a replacement facility.

Environmental Restoration Management Contractor (ERMC). The Hanford Site has been chosen to implement this innovative approach to the management, technical imple-

The installation of modular facilities onsite could provide permanent office space in a timely manner.

mentation, and cost control of environmental restoration activities. The DOE announced the award of the ERM to Bechtel Hanford, Inc. (Bechtel) on January 15, 1993. Two protests of that award were filed with the General Accounting Office (GAO). As a result, DOE has issued a stop work order to Bechtel, directing them not to work under ERM until the stop work order is canceled. The implementation of the ERM will require facilities to accommodate additional personnel. Uncertainties in both the number of personnel ERM will include and the speed at which the ERM will be implemented make it difficult to assess impacts at this time.

Adjacent Jurisdictions. Development on the Hanford Site is supported by a number of services provided by adjacent jurisdictions. Coordination with these local planning authorities is critical to future development at the Hanford Site.

Communication and good-neighbor relationships with local planning authorities have addressed land use and development planning issues in a positive manner. For example, the Hanford Site is providing information to local jurisdictions for use in their efforts to comply with Washington State's Growth Management Act, and negotiations are in progress to extend the City of Richland's sewer system to the 300 Area.

Facility Transition Planning. In 1992, the DOE established the Environmental Restoration and Waste Management Office of Facility Transition. The program is responsible for coordinating and overseeing the orderly transition of contaminated installations/facilities from other program offices to EM once they are determined to be surplus to their original mission. Several facilities (e.g., PUREX and UO₂ plants) at the Hanford Site are currently in transition to achieve safe shutdown and then transfer to Environmental Restoration for decontamination and decommissioning.

Economic Transition. In January 1993, RL established the Office of Economic Transition to develop economic transition policies and coordination of economic initiatives that will support Hanford environmental cleanup objectives and regional economic diversification goals. A major goal is to broaden the involvement of all U.S. industry at Hanford, including small business, startup companies, and entrepreneurs who have innovative solutions to our technical and business needs. There will be more opportunities for local and regional economic diversification as new markets and resources are opened for private industry at Hanford. The goal is to re-orient the cleanup approach so the community

which supports Hanford has a sound economic base at the end of the cleanup mission.

Infrastructure Improvements. Capital improvements to the existing infrastructure systems are required if the Hanford Site is to continue as a significant industrial and scientific resource to support national and international science and technology needs. Also, new facilities and infrastructure systems will be required to support cleanup activities. Many of the general-purpose and programmatic facilities are inadequate (technologically and structurally) to support the cleanup mission during the next 30 to 50 years.

Occupancy of the World War II vintage buildings force costly maintenance and upgrades to ensure safe and reliable operations.

Stakeholder Negotiations. The DOE, EPA, and the Washington State Department of Ecology have agreed to a six-month period to jointly examine alternative proposals, to consult with the public, and to conclude negotiations on a reasonable course of action for handling Hanford's tank wastes. The goal is to complete these negotiations by September 30, 1993. The DOE has recently completed a "rebaselining" review of Hanford's Tank Waste Remediation System (TWRS). The DOE believes there exists a strong technical rationale for restructuring TWRS. It is recognized that restructuring of the tank waste remediation program could result in major changes to the activities and schedules embodied in the milestones of the Tri-Party Agreement. In addition to renegotiating TWRS milestones, the three agencies are negotiating additional Environmental Restoration and Waste Management milestones and changes to Tri-Party Agreement administration/enforcement provisions. Uncertainties to the outcomes of these negotiations make it difficult to assess impacts at this time. Major restructuring could significantly affect projected land and infrastructure requirements, as well as the methods and procedures for managing the entire Tri-Party Agreement.

Appendix A

Glossary.

Exclusive—An area where access would be limited, because of risk, to personnel who are trained and monitored for working with radioactive or hazardous materials.

Facility—A general term to describe fixed site improvements such as buildings, structures, roads, and utilities.

Facility Requirements—The size and configuration of buildings, roads, structures, lands and other facilities and resources required in support of missions on the Hanford Site.

Hazardous Waste—Nonradioactive chemical toxins or other potentially dangerous materials as defined in the *Resource Conservation and Recovery Act of 1976*, Section 1004(5), and the *State of Washington Hazardous Waste Management Act of 1976*, Revised Code of Washington RCW 70.104.010(15).

High-Level Waste—Highly radioactive waste material resulting from the reprocessing of spent nuclear fuel. This includes liquid waste directly produced in reprocessing and any solid waste derived from the liquid, which contains a combination of transuranic waste and fission products in concentrations requiring permanent isolation.

Infrastructure—The basic physical improvements on the land and associated services (e.g., roads, rail, electrical, and fire) in support of missions on the Hanford Site.

Low-Level Waste—Waste that contains radioactivity and is not classified as high-level waste, transuranic waste, or spent nuclear fuel. Solid low-level waste consists of trash such as clothing, tools, and glassware. Liquid low-level waste consists primarily of water circulated as cooling water. Low-level mixed waste contains both radioactive and hazardous waste.

Master Plan—A document or map that shows facilities or land uses required to support future missions at some point in time, usually 20 years in the future.

Mixed Waste—Waste that contains both radioactive and hazardous components as defined by the *Atomic Energy Act of 1954* and the *Resource Conservation and Recovery Act of 1976*, respectively.

Operable Unit—An area of land that groups waste management units for remedial investigation and feasibility study (RI/FS). The identified area forms the basis for the environmental restoration activities to clean up the waste units.

Radioactive Waste—Solid, liquid, or gaseous material of negligible economic value that contains radionuclides.

Restricted—Designation of an area that limits the use of an area because of contamination. It can apply to the air, surface, subsurface or groundwater.

Site Development Plan—A summary-level document for senior managers that presents site development (land use) issues that require a commitment of resources to support the Hanford Site.

Treatment, Storage, and Disposal Unit—A *Resource Conservation and Recovery Act of 1976* term referring to the treatment, storage, and disposal of hazardous waste. Applies only to units that received or stored hazardous waste after November 19, 1980, the effective date of the regulations.

Unrestricted—Designation of an area that would not preclude any human use of an area.

Waste Management Units—Locations where radioactive waste or chemicals and hazardous material were either intentionally or unintentionally released to the ground.

Land Use Categories.

There are currently seven Hanford Site land use categories. A operable unit overlay zone is also used to identify existing waste management units. This Operable Unit Overlay Zone is removed when remediation activities are completed as shown in The Future Land Use Map. It is based on the assumption that the land within the source operable units will be cleaned up and released for new uses when remediation activities are completed. The boundaries of source operable units may expand or change as new waste management units are identified or clarified.

The land use categories shown on the maps are based on activity types not on programmatic ownership or contractor

function. The land use and overlay zone categories are defined below.

Reactor Operations—Development and irradiation of nuclear fuels. Includes fuel fabrication, fuel storage, reactor plant operations, associated electrical power production, and storage of advanced materials. Also includes support activities located directly at the operating site dedicated solely to that operation (i.e., maintenance, engineering, and administration).

Waste Operations—The treatment, storage, and disposal of radioactive and nonradioactive wastes. Includes waste treatment facility operations and active and inactive tank farms, burial grounds, vaults, cribs, basins, landfills, ditches, and trenches. Also includes support activities located directly at the operating site dedicated solely to that operation (i.e., maintenance, engineering, and administration).

Operations Support—Services provided specifically for operations, which are centrally located to enhance access. Activities are primarily industrial in nature.

Administrative Support—Services provided for overall Hanford Site activities. Includes general-purpose systems and facilities. Activities are primarily administrative in nature.

Research and Development and Engineering Development—Basic and applied research to advance fundamental scientific knowledge. Includes engineering, technology development and deployment activities to meet major national needs.

Sensitive Areas—Environmentally (e.g., wildlife refuges, ecological research) or culturally (e.g., historical archaeological, or religious) significant areas.

Undeveloped Areas—Areas that have not been developed or have been restored to an undeveloped state.

Operable Unit Overlay Zone—Area identified for characterization and remediation of land and groundwater. Includes demolition, cleanup, in situ stabilization, restoration, and postclosure monitoring. Also includes support activities located directly at the operable unit site dedicated solely to that operable unit.

References.

- AEA, 1954, *Atomic Energy Act of 1954*, as amended, 42 USC 2011 et seq.
- CERCLA, 1980, *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*, as amended, 42 USC 6901 et seq.
- DOE, 1991, *Site Development Planning*, DOE Order 4320.1B, U.S. Department of Energy, Washington, D.C.
- DOE/EIS, 1987, *Final Environmental Impact Statement, Disposal of Hanford Defense High-Level, Transuranic and Tank Wastes*, DOE/EIS-0113 (Volumes 1-5), U.S. Department of Energy, Washington, D.C. (December).
- DOE/EIS, 1992, *Addendum (Final Environmental Impact Statement), Decommissioning of Eight Surplus Production Reactors at the Hanford Site*, DOE/EIS-0119F, U.S. Department of Energy, Washington, D.C. (December).
- DOE/RL, 1989, *Hanford Site Infrastructure Plan*, DOE/RL-89-31, U.S. Department of Energy, Richland Operations Office, Richland, Washington (January).
- DOE/RL, 1991, *Hanford 300 Area Development Plan*, DOE/RL-91-09, U.S. Department of Energy, Richland Operations Office, Richland, Washington (September).
- DOE/RL, 1993, *Hanford Mission Plan, Volume I, Site Guidance*, DOE/RL-93-08, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- Drummond, Marshall E., Dr., (President, Eastern Washington University; chair Future Site Uses Working Group), 1992, *The Future for Hanford: Uses and Cleanup, A Final Report of the Hanford Future Site Uses Working Group* (December).
- Ecology, EPA, and DOE, 1990, *Hanford Federal Facility Agreement and Consent Order*, 2 Vols., as amended, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington.

HWMA, 1976, *Hazardous Waste Management Act of 1976*, Revised Code of Washington RCW 70.104.010(15), Olympia, Washington.

NEPA, 1969, *National Environmental Policy Act of 1969*, as amended, 42 USC 4321 et seq.

NPS, 1992, *The Hanford Reach of the Columbia River, Draft River Conservation Study and Environmental Impact Statement*, National Park Service, Seattle, Washington (October).

RCRA, 1976, *Resource Conservation and Recovery Act of 1976*, as amended, 42 USC 9601 et seq.

WHC, 1993, Engineering Study, *Hanford Integrated Office Space Plan*, WHC-SD-LL-ES-033, Rev., Westinghouse Hanford Company, Richland, Washington (February).

END

DATE
FILMED

12 / 1 / 93