



1.0 Introduction

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This report, published annually since 1958, includes information and summary data that (1) provide an overview of activities at the Hanford Site during 2001, (2) characterize environmental management performance at the site; (3) demonstrate the status of the site's compliance with applicable federal, state, and local environmental laws and regulations; and (4) highlight significant environmental monitoring and surveillance programs and efforts.

Specifically, this report provides a short introduction to the Hanford Site, discusses the site mission, and briefly highlights the site's various environmental-related programs. Included are descriptions of the Environmental Restoration Project, the Effluent and Near-Facility Environmental Monitoring Program, the

Surface Environmental Surveillance Project, the Hanford Groundwater Monitoring Project, Vadose Zone Monitoring, the Hanford Cultural Resources Laboratory, Ecosystem Monitoring, Ecological Compliance, the Meteorological and Climatological Services Project, and information about other programs and projects. Also included are sections discussing environmental occurrences, current issues and actions, environmental cleanup and restoration activities, compliance issues, and descriptions of major operations and activities. Readers interested in more detail than that provided in this report should consult the technical documents cited in the text and listed in the reference sections. Descriptions of specific analytical and sampling methods used in the monitoring efforts are contained in the Hanford Site environmental monitoring plan (DOE/RL-91-50).

1.0.1 Current Site Mission

For more than 40 years, Hanford Site facilities were dedicated primarily to the production of plutonium for national defense and to the management of the resulting waste. Hanford was the first plutonium production site in the world. In recent years, efforts at the site have focused on developing new waste treatment and disposal technologies and characterizing and cleaning up contamination left from historical operations.

Currently, the Hanford Site's primary mission includes cleaning up and shrinking the size of the site from ~1,517 square kilometers (~586 square miles) to ~194 square kilometers (~75 square miles) by the target date of 2012. *Accelerating Cleanup and Shrinking the Site* (DOE/RL-2000-62) states that the cleanup mission includes three strategies:

- **restoring the Columbia River corridor** by continuing to clean up Hanford Site sources of radiological and chemical contamination that threaten

the air, groundwater, or Columbia River. It is expected that most river corridor projects will be completed by 2012.

- **transitioning the Central Plateau** (200-East and 200-West Areas) from primarily inactive waste storage to active waste characterization, treatment, storage, and disposal operations which are expected to last for another 40 years.
- **preparing for the future** by getting ready for long-term stewardship, other U.S. Department of Energy (DOE) and non-DOE federal missions, and other public and private sector uses.

The goal of these strategies is to complete major portions of the site cleanup by 2012 and to do so in a manner that protects the environment and uses taxpayer's dollars wisely and efficiently.

1.0.2 Overview of the Hanford Site

The Hanford Site lies within the semi-arid Pasco Basin of the Columbia Plateau in southeastern Washington State (Figure 1.0.1). The site occupies an area of ~1,517 square kilometers (~586 square miles) located north of the city of Richland (DOE/EIS-0222). This large area has restricted public access and provides a buffer for the smaller areas on the site that historically were used for production of nuclear materials, waste storage, and waste disposal. The Columbia River flows eastward through the northern part of the Hanford Site and then turns south, forming part of the eastern site boundary.

The 78,900-hectare (195,000-acre) Hanford Reach National Monument (Figure 1.0.2) was established by a Presidential Proclamation in June 2000 (65 FR 114) to protect the nation's only non-impounded stretch of the Columbia River above Bonneville Dam and the largest remnant of the shrub-steppe ecosystem once blanketing the Columbia River Basin. In 2001, DOE and the U.S. Fish and Wildlife Service were joint stewards of the monument with the U.S. Fish and Wildlife Service administering three major management units of the monument totaling ~66,775 hectares (~165,000 acres). These included (1) the Fitzner/Eberhardt Arid Lands Ecology Reserve Unit, a 312 square kilometer (120 square mile) tract of land in the southwestern portion of the Hanford Site; (2) the Saddle Mountain Unit, a 130 square kilometer (50 square mile) tract of land located north-northwest of the Columbia River and generally south and east of State Highway 24; and (3) the Wahluke Unit, a 225 square kilometer (87 square mile) tract of land located north and east of both the Columbia River and the Saddle Mountain Unit (see Figure 1.0.1). The portion of the monument administered only by DOE included the McGee/Riverlands area (north and west of State Highway 24 and south of the Columbia River), the Columbia River islands in Benton County, the Columbia River corridor (one-quarter mile inland from the Hanford Reach shoreline) on the Hanford (Benton County) side of the river, and the sand dunes area located along the Hanford side of the Columbia River north of Energy Northwest. Approximately 162 hectares (~400 acres) along the north side of the Columbia River, west of the Vernita Bridge, and south of State Highway 243 is managed by the Washington State Department of Fish and Wildlife. All of these lands have served as a safety and security buffer zone for Hanford Site operations since 1943, resulting in an ecosystem that has been relatively untouched for nearly 60 years.

The major DOE operational, administrative, and research areas on and around the Hanford Site (see Figure 1.0.1) include:

- **The 100 Areas** – located along the south shore of the Columbia River. These are the sites of nine retired plutonium production reactors. The 100 Areas occupy ~11 square kilometers (4 square miles).
- **The 200-West and 200-East Areas** – centrally located on a plateau. These areas are ~8 and 11 kilometers (~5 and 7 miles), respectively, south and west of the Columbia River. These areas house facilities that received and dissolved irradiated fuel and then separated out the valuable plutonium. These facilities were called “separations plants.” The 200 Areas cover ~16 square kilometers (6 square miles).
- **The 300 Area** – located just north of the city of Richland. From the early 1940s until the advent of the cleanup mission, most research and development at the Hanford Site were carried out in the 300 Area. The 300 Area was also the location of nuclear fuel fabrication. This area covers ~1.5 square kilometers (~0.6 square mile).
- **The 400 Area** – location of the Fast Flux Test Facility, scheduled for deactivation. This special nuclear reactor was designed to test various types of nuclear fuel. The 400 Area is located ~8 kilometers (~5 miles) northwest of the 300 Area and covers ~0.61 square kilometers (~0.23 square mile).
- **The 600 Area** – includes all of the Hanford Site not occupied by the 100, 200, 300, and 400 Areas.
- **The former 311-hectare (768-acre) 1100 Area** – located generally between the 300 Area and the city of Richland. On October 1, 1998, this area was transferred to the Port of Benton as a part of DOE's Richland Operations Office economic diversification efforts and is no longer part of the Hanford Site. However, DOE contractors continue to lease facilities in this area.
- **The Richland North Area** (off the site) – includes the Environmental Molecular Sciences Laboratory and other DOE and contractor facilities, mostly leased office buildings, generally located in the northern part of the city of Richland.

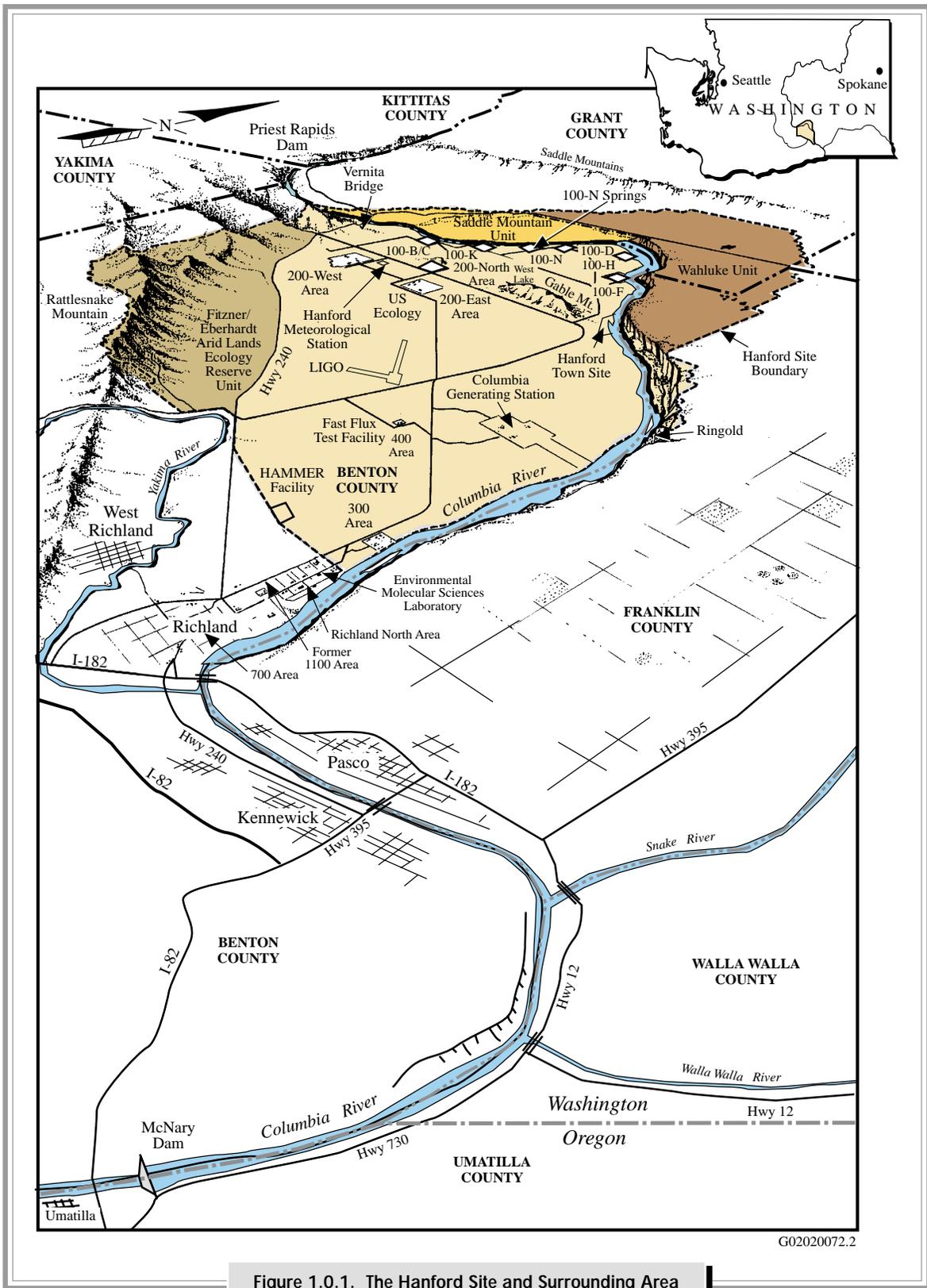


Figure 1.0.1. The Hanford Site and Surrounding Area

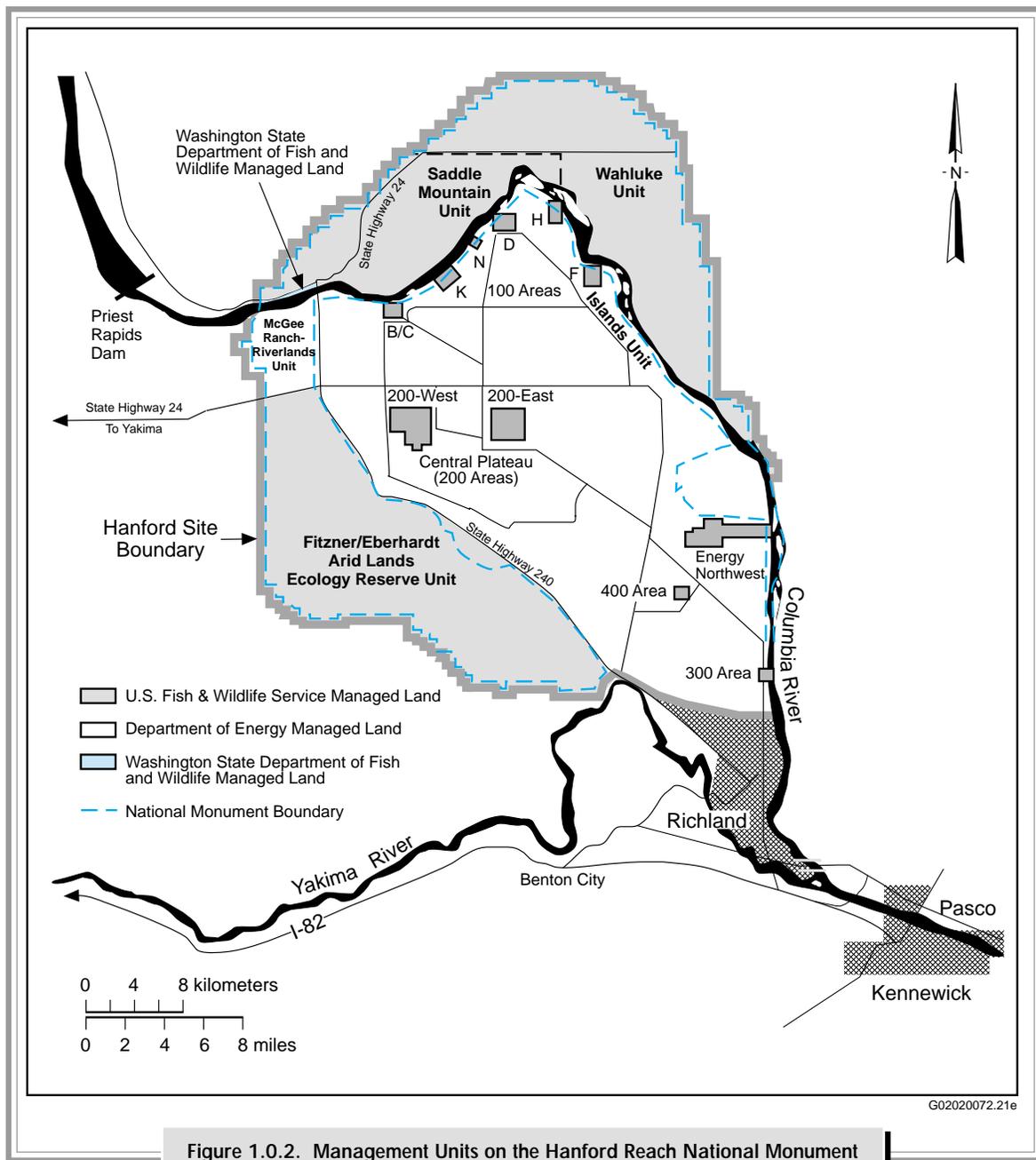


Figure 1.0.2. Management Units on the Hanford Reach National Monument (Monument boundaries are approximate.)

- The Volpentest Hazardous Materials Management and Emergency Response Training and Education Center** (also called HAMMER) – a worker safety training facility located on the site near the city of Richland. It consists of a 32-hectare (80-acre) main site and a 4,000-hectare (10,000-acre) law enforcement and security training site. The facility is owned by DOE, managed by Fluor Hanford, Inc., and used by site contractors, a variety of federal and state agencies, tribal governments, and private industry.

Other site related facilities (office buildings) are located within the Tri-City area.

Non-DOE operations and activities on Hanford Site leased land or in leased facilities include commercial power production by Energy Northwest (4.4 square kilometers [1.6 square miles]) and operation of a commercial low-level radioactive waste burial site by US Ecology, Inc. (0.4 square kilometer [0.2 square mile]). The National Science Foundation built the Laser Interferometer Gravitational-Wave Observatory for gravitational wave studies. The observatory, constructed

between 1994 and 1999, is operated jointly by the California Institute of Technology and the Massachusetts Institute of Technology. R. H. Smith Distributing operates vehicle-fueling stations in the former 1100 Area and in the 200 Areas. Washington State University at Tri-Cities operated several laboratories in the 300 Area until March 2002. Livingston Rebuild Center, Inc. has leased the 1171 Building, in the former 1100 Area, to rebuild train locomotives. Johnson Controls, Inc. operates 42 diesel and natural gas package boilers to produce steam in the 200 and 300 Areas (replacing the old coal-fired steam plants) and also has compressors supplying

compressed air to the site. Kaiser Aluminum and Chemical Corporation leased the 313 Building in the 300 Area from 1994 until January 2002 to use an extrusion press that was formerly DOE owned.

Near the city of Richland, immediately adjacent to the southern boundary of the Hanford Site, Framatome ANP, Inc. operates a commercial nuclear fuel fabrication facility and Allied Technology Group Corporation operates a low-level radioactive waste decontamination, super compaction, and packaging facility.

1.0.3 Site Management

The DOE's Richland Operations Office and the Office of River Protection manage the Hanford Site through several contractors and their subcontractors. Each contractor is responsible for safe, environmentally sound, maintenance and management of its activities or facilities; for waste management; and for monitoring any potential effluents to assure environmental compliance. The U.S. Fish and Wildlife Service at the Hanford Site administered much of the site under the National Wildlife Refuge System and managed the land in accordance with the Presidential Proclamation (65 FR 114) establishing the Hanford Reach National Monument. The U.S. Fish and Wildlife Service was a joint steward of portions of the monument with DOE.

DOE Richland Operations Office. The DOE Richland Operations Office manages legacy cleanup, research, and other programs at the Hanford Site.

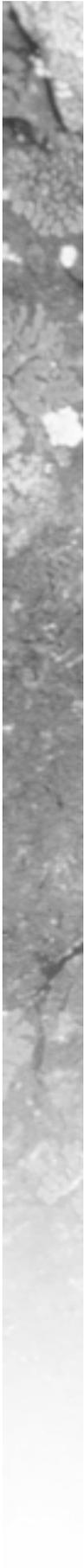
In 2001, the principal contractors for the DOE Richland Operations Office, and their respective responsibilities, included the following:

- **Bechtel Hanford, Inc.** – the environmental restoration contractor. Bechtel Hanford, Inc. planned, managed, executed, and integrated a full range of activities for the cleanup of groundwater, contaminated soil, and inactive nuclear facilities. Bechtel Hanford, Inc.'s preselected subcontractors were CH2M HILL Hanford, Inc. and Eberline Services Hanford, Inc.
- **Fluor Hanford, Inc.** – the prime contractor for the nuclear legacy cleanup. Fluor Hanford, Inc.'s three principal subcontractors were Duke Engineering & Services Hanford, Inc.; Duratek Federal Services of Hanford, Inc.; and Numatec Hanford Corporation. Other subcontractors to Fluor Hanford included Day & Zimmerman Protection Technology Hanford.

- **Hanford Environmental Health Foundation** – Hanford Environmental Health Foundation's Health Risk Management Program worked to identify and analyze the hazards that Hanford personnel faced in the work environment. Hanford Environmental Health Foundation's occupational health services provided occupational medicine and nursing, medical surveillance, ergonomics assessment, exercise physiology, case management, psychology and counseling, fitness for duty evaluations, health education, infection control, immediate health care, industrial hygiene, and health, safety, and risk assessment.
- **MACTEC-ERS** – a prime contractor to the DOE Grand Junction Office. The Grand Junction Office has contracted with the DOE Richland Operations Office and the DOE Office of River Protection to conduct vadose zone, geophysical characterization, and monitoring work at former waste disposal facilities on the site.
- **Pacific Northwest National Laboratory** – Battelle operated the Pacific Northwest National Laboratory for DOE's national security and energy missions. The core mission was to deliver environmental science and technology in the service of the nation and humanity. Pacific Northwest National Laboratory services included molecular science research, advanced processing technology, biotechnology, global environmental change research, and energy technology development.

DOE Office of River Protection. The DOE Office of River Protection was established by Congress in 1998 as a field office to manage DOE's largest, most complex environmental cleanup project—Hanford tank waste retrieval, treatment, and disposal. Sixty percent of the nation's high-level radioactive waste is stored at Hanford in aging tanks.





The principal contractors for the DOE Office of River Protection in 2001 and their respective responsibilities included:

- **Bechtel National, Inc.** – Bechtel National, Inc.’s contract mission is to design, build, and commission a Waste Treatment Plant to vitrify Hanford’s tank waste. The project includes a pretreatment facility to separate the tank waste into high-level radioactive and low-activity radioactive streams. Separate vitrification facilities will immobilize the waste in a glass form encased in stainless steel canisters. High-level waste will be stored at the Hanford Site for eventual disposal at a federal repository. Low-activity waste will be disposed of in concrete-lined
- **CH2M HILL Hanford Group, Inc.** – the DOE Office of River Protection’s prime contractor with responsibility for storing and retrieving for treatment ~204 million liters (54 million gallons) of highly radioactive and hazardous waste stored in 177 underground tanks. The company’s role includes characterizing the waste and delivering it to the future waste vitrification facility. In January 2001, the contract for CH2M HILL Hanford Group, Inc. was extended through 2006.

1.0.4 References

65 FR 114. June 13, 2000. Presidential Proclamation 7319, “Establishment of the Hanford Reach National Monument.” Federal Register.

DOE/EIS-0222. 1999. *Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement*. Online report. <http://www.hanford.gov/eis/hraeis/hraeis.htm>

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