

## 1.0 Introduction

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*SA Thompson*

Since 1959, the U.S. Department of Energy (DOE) has published the Hanford Site Environmental Report annually to inform the public, regulators, stakeholders, and other interested parties of the site's environmental performance during the year. The Hanford Site Environmental Report for Calendar Year (CY) 2014 includes a brief description of the Hanford Site mission; compliance with applicable federal, state, and local environmental laws, regulations permits, executive orders, DOE policies and directives; and descriptions of summary data from environmental-related programs. The annual environmental reports are available on the Internet at <http://msa.hanford.gov/page.cfm/enviroreports>. The reports include sections that describe the following:

- ◊ Site compliance with local, state, and federal environmental standards and requirements
- ◊ Site operations, including environmental restoration efforts and cleanup and closure activities
- ◊ Environmental management performance
- ◊ Environmental occurrences and responses
- ◊ Effluents and emissions from site facilities
- ◊ Results of onsite and offsite environmental and groundwater monitoring efforts
- ◊ Cultural and biological resource assessments.

Additional detail is provided in the appendices, and descriptions of specific analytical and sampling methods used for the 2014 monitoring efforts are provided in the *Hanford Site Environmental Monitoring Plan* ([DOE/RL-91-50](#)).

Section 1.0 provides information on the Hanford Site's location and environmental setting, including mission, management, primary operations and activities, and climate and meteorology. It also discusses stakeholder involvement, the role of Native American tribes, and Hanford regulatory oversight.

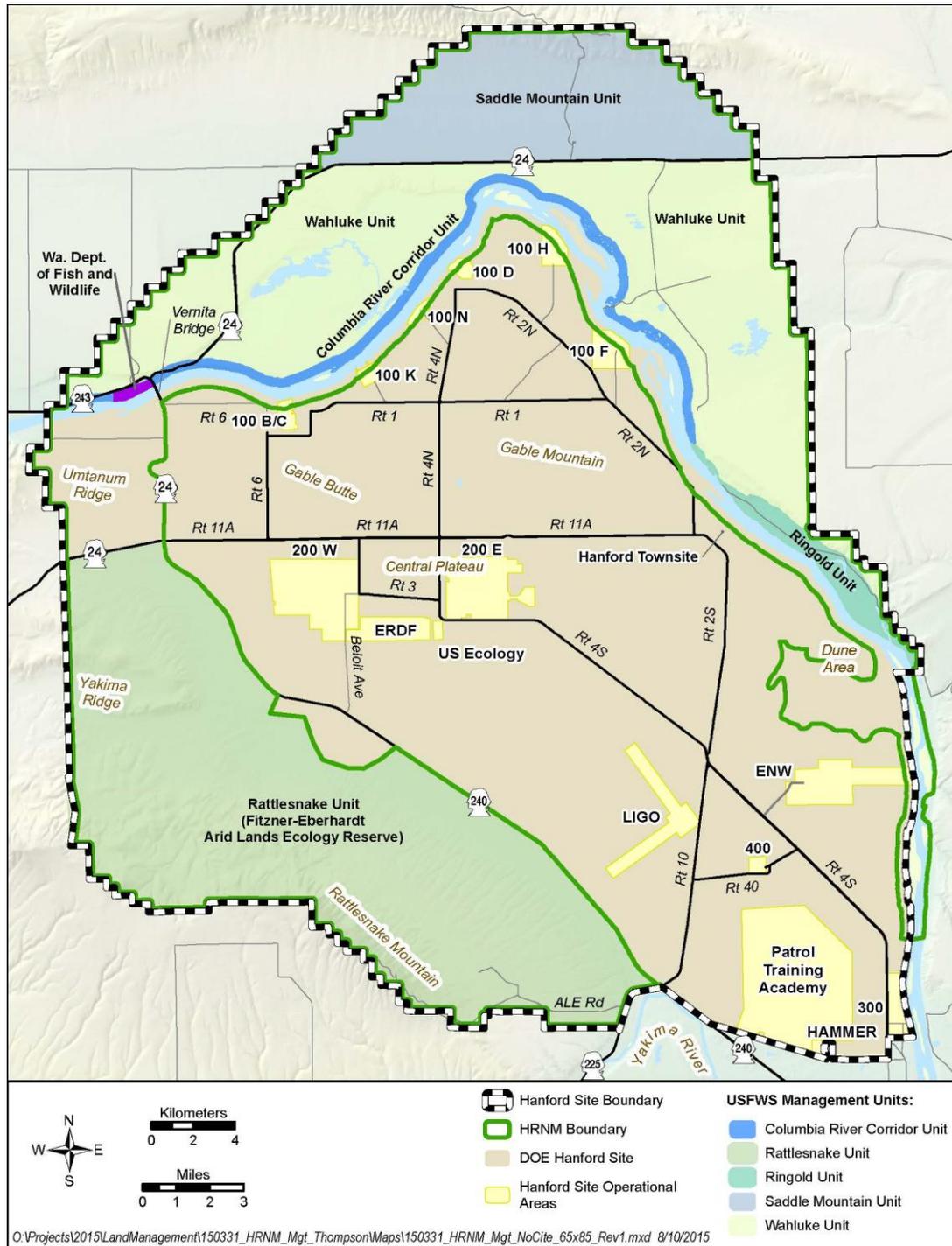
### 1.1 Hanford Site Location,

The Hanford Site lies within the semi-arid Pasco Basin of the Columbia Plateau in southeastern Washington State (Figure 1.1). The site occupies an area of approximately 586 square miles (1,517 square kilometers) north of the confluence of the Yakima and Columbia rivers. This land, with restricted public access, provides a buffer for areas once used for nuclear materials production, waste storage, and waste disposal. The Columbia River flows through the northern part of the site, and turning south, forms part of the eastern site boundary. Rattlesnake Mountain, Yakima Ridge, and Umtanum Ridge form the southwestern and western boundaries, and the Saddle Mountains form the northern boundary. Adjoining lands are principally range and agriculture land. The cities of Richland, Pasco, and Kennewick (the Tri-Cities) constitute the nearest population centers and are located southeast of the Hanford Site ([PNNL-6415 Rev 16](#)).

The region's climate is greatly influenced by the Pacific Ocean, the Cascade Range to the west, and other mountain ranges located to the north and east. Other geographic features include the White Bluffs, Gable Mountain, and Gable Butte. Average annual precipitation is 7.08 inches (17.98 centimeters). In addition

to the Columbia River, natural surface waters on the Hanford Site include Rattlesnake and Snively springs and West Lake. The Hanford Site is characterized as a shrub-steppe ecosystem. Plant and wildlife communities include both terrestrial and aquatic species, some of which are considered rare and/or declining or are of significant interest to federal, state, or tribal governments or the public.

Figure 1.1. Hanford Site and Hanford Reach National Monument (HRNM)



## 1.2 Hanford Site Mission

The Hanford Site played a pivotal role in the nation's defense for more than 40 years. During the World War II Manhattan Project and Cold War, Hanford Site facilities were dedicated primarily to the production of plutonium to fuel atomic weapons and management of the resulting legacy waste. In 1989, when the U.S. Environmental Protection Agency (EPA), Washington State Department of Ecology (Ecology), and DOE (Tri-Party Agencies) signed the *Hanford Federal Facility Agreement and Consent Order* ([Ecology et al. 1989a](#)) (also known as the Tri-Party Agreement or TPA), the primary mission shifted to developing new waste treatment and disposal technologies and characterizing and cleaning up contamination left from historical operations. The Hanford Site's current mission focuses on environmental restoration, which includes remediation of contaminated areas, decontamination and decommissioning of Hanford Site facilities, waste management, and related scientific and environmental research and development of waste management technologies.

## 1.3 Primary Operations and Activities

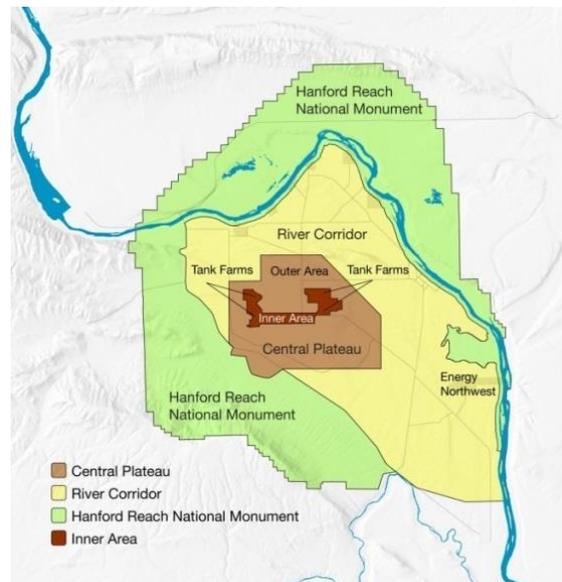
The major DOE operational, administrative, and research areas on and around the Hanford Site include the following:

- ⊙ **100 Area** – The 100 Area consists of six distinct sites (100-B/C, 100-D, 100-F, 100-H, 100-K, and 100-N) that are located along the shore of the Columbia River in the northern portion of the Hanford Site. These areas were the location of nine nuclear reactors that have since been retired. Collectively, the 100 Area occupies approximately 4 square miles (11 square kilometers). The B Reactor, a National Historic Landmark, is located in the 100-B Area. As the world's first industrial-scale nuclear reactor, B Reactor produced plutonium for the first atomic explosion (Trinity Test) and the atomic bomb that was detonated over Nagasaki, Japan.
- ⊙ **200 Area** – The 200-East and 200-West Areas cover approximately 6 square miles (16 square kilometers) and are located on the Central Plateau, approximately 5 and 7 miles (8 and 11 kilometers) south and west of the Columbia River. The plateau surface is approximately 328 feet (100 meters) above the level of the Columbia River and about 280 feet (85 meters) above the underlying water table. These areas contain underground waste storage tanks and housed facilities (known as separations plants) that extracted plutonium from dissolved irradiated fuel. The 200-North Area covers approximately 58.6 acres (23.7 hectares), and operations here are mainly related to irradiated nuclear fuel interim storage. Thermal cooling of the spent fuel required water, which was disposed of at several sites within the 200-North Area. Remediation of these sites is ongoing.
- ⊙ **300 Area** – The 300 Area is located just north of the city of Richland and covers approximately 0.6 square mile (1.5 square kilometers). From the early 1940s until the advent of the environmental cleanup mission in 1989, nuclear fuel fabrication and research and development activities were performed at the 300 Area. Remediation of waste sites and decommissioning of 300 Area facilities is ongoing.
- ⊙ **400 Area** – The 400 Area is located northwest of the 300 Area, and covers approximately 0.23 square mile (0.61 square kilometer). This area includes the Fast Flux Test Facility (FFTF), a nuclear reactor designed and used to test various types of nuclear fuel, produce medical and industrial isotopes, and

conduct cooperative international research. The FFTF operations were discontinued in 1992, and the facility is now in a low-cost, long-term surveillance and maintenance condition.

- ⊗ **600 Area** – The 600 Area includes all of the Hanford Site not occupied by the 100, 200, 300, and 400 Areas.
- ⊗ **1100 Area** – The former 1100 Area is located between the 300 Area and the city of Richland and covers 1.2 square miles (3.1 square kilometers). In October 1998, this area was transferred to the Port of Benton as part of DOE’s economic diversification efforts and is no longer part of the Hanford Site. However, DOE contractors continue to lease facilities in this area.
- ⊗ **Richland North Area** (off site) – This area includes the Environmental Molecular Sciences Laboratory, Pacific Northwest National Laboratory (PNNL), and other DOE and contractor facilities (mostly office buildings), generally located in the northern part of the city of Richland.
- ⊗ **700 Area** (off site) – The 700 Area includes DOE administrative buildings in the central region of the city of Richland.
- ⊗ **Volpentest HAMMER Federal Training Center** (HAMMER) – HAMMER is a worker safety training facility located on the Hanford Site near the city of Richland and is used by site contractors, federal and state agencies, tribal governments, and private industry. HAMMER contracts with emergency response agencies and offers classes in fire suppression, hostage rescue, high-speed pursuit, and drug enforcement. The center also works with the U.S. Department of State to train international border patrol agents and homeland security staff. The facility consists of a 0.12-square-mile (0.31-square-kilometer) main site and a 15.6-square-mile (40.4-square-kilometer) law enforcement and security-training site.
- ⊗ **Non-DOE Operations and Activities on Hanford Site Leased Land** – Energy Northwest operates a commercial nuclear power reactor at the Columbia Generating Station, north of the 300 Area, on 1,090 acres (440 hectares). US Ecology Washington operates a commercial low-level radioactive waste burial site, located west of the 200-East Area on 99 acres (40 hectares). West of the 400 Area, the California Institute of Technology and Massachusetts Institute of Technology jointly operate the Laser Interferometer Gravitational-Wave Observatory, which is sponsored by the National Science Foundation.
- ⊗ **Non-DOE Nuclear Operations Near the City of Richland** – AREVA NP, Inc., operates a commercial nuclear fuel fabrication facility near the southern boundary of the Hanford Site, and Perma-Fix Northwest, Inc., operates a low-level and mixed low-level radioactive waste processing facility located immediately adjacent to the southern boundary of the Hanford Site on 53 acres (21 hectares). In addition, Westinghouse Electric Company operates the Richland Service Center in north Richland, which provides chemical cleaning, chemical decontamination, and related chemical and waste processing services to the nuclear industry.
- ⊗ **Hanford Reach National Monument** – The Hanford Reach National Monument (Figure 1.1), established by Presidential Proclamation *Establishment of the Hanford Reach National Monument* (65 FR 37253) in June 2000, covers 195,000 acres (78,900 hectares). The purpose of the monument is to protect the nation’s only non-impounded stretch of the Columbia River upstream of Bonneville Dam and the remaining shrub-steppe ecosystem that once blanketed the Columbia River Basin. The

monument is divided into five distinct administrative units: Rattlesnake (Fitzner/Eberhardt Arid Lands Ecology Reserve), Columbia River Corridor, Ringold, Wahluke, and Saddle Mountain. The U.S. Fish and Wildlife Service (USFWS), Washington Department of Fish and Wildlife (WDFW), and DOE, Richland Operations Office (RL) manage portions of the monument. DOE-RL manages a 14-square-mile (36.4 kilometer) area of the monument north and west of State Highway 24 and south of the Columbia River in Benton County known as McGee Ranch/Riverlands. DOE also manages the River Corridor Unit, which includes Hanford Reach islands (Benton County) and a 0.25-mile (0.4-kilometer)-wide strip of land along the Hanford Reach shoreline from Vernita Bridge to just north of the 300 Area. This 39-square-mile (101-square-kilometer) area in Benton, Franklin, and Grant counties also includes the 9.9-square-mile (25.6-square-kilometer) Hanford Site dunes north of Energy Northwest.



## 1.4 Hanford Site Management

*SA Thompson*

DOE is responsible for operating the Hanford Site. DOE-RL and the Office of River Protection (ORP) jointly manage the site through several contractors and their subcontractors. Each contractor is responsible for safe, environmentally sound maintenance and management of its activities or facilities; waste management; evaluation and determination of all discharges to the environment; and for monitoring any potential effluent to ensure environmental regulatory compliance. DOE, the USFWS, and the WDFW each manage portions of the Hanford Reach National Monument, as described above.

The **DOE Richland Operations Office** serves as the Hanford Site property owner and oversees cleanup along the Columbia River and in Hanford's Central Plateau, including groundwater and waste site cleanup; management of solid waste, spent nuclear fuel and sludge; facility cleanout, deactivation and demolition; environmental restoration; plutonium management; and all site support services. The principal contractors for RL and their respective responsibilities include the following:

- ⊙ [Mission Support Alliance, LLC](#) (MSA) was awarded the Mission Support Contract for the Hanford Site in 2009. MSA is a joint venture between Lockheed Martin, Jacobs, and Centerra Group, as well as several partners with specialized Hanford expertise. MSA is responsible for site infrastructure services for the Hanford Cleanup mission, including but not limited to: roads and transportation services; electrical and water services; facility maintenance; emergency response (fire and patrol) services; network and software engineering; cyber security and records management; as well as environmental compliance and clean energy solutions.

- ⊗ [CH2M HILL Plateau Remediation Company](#) (CHPRC) was awarded the Plateau Remediation Contract in 2008. CHPRC is responsible for the safe environmental cleanup of the Central Plateau at the Hanford Site, including waste retrieval and fuels management, groundwater and vadose zone remediation, demolition of facilities and canyons, closure of the Plutonium Finishing Plant (PFP), and remediating the 100-K Area along the Columbia River, which includes preparing for treatment of highly radioactive sludge that is now in the K-West Basin, where it will be stored until it can be treated.
- ⊗ [Washington Closure Hanford, LLC](#) (WCH) was awarded the River Corridor Closure Contract in March 2005. WCH is made up of the Washington Division of URS Corporation, Bechtel National, Inc. (BNI), and CH2M HILL Hanford Group, Inc. WCH workers are responsible for cleaning up waste sites at Hanford, decontaminating and decommissioning former plutonium production nuclear reactors and surplus facilities, and disposing of contaminated waste. WCH is expected to complete its mission for DOE-RL by 2016.
- ⊗ [HPMC Occupational Medical Services](#) (HPMC) was awarded the occupational medical contract for the Hanford Site in 2012. HPMC Occupational Medical Services provides occupational medical services to DOE and Hanford employees. It is responsible for the health and safety needs of more than 10,000 Hanford workers. HPMC has clinics in Richland and the Hanford 200-West Area.

The **DOE Office of River Protection** was established by Congress in 1998 as a field office to manage the retrieval, treatment, and disposal of approximately 53 million gallons (200 million liters) of radioactive tank waste currently stored in 177 underground tanks in the central part of the site. The tank waste is material left over from years of World War II and post-war production of nuclear weapons fuel. In support of this mission, ORP is responsible for the safe operation of the tank farms and construction and operation of the Waste Treatment and Immobilization Plant (WTP), located on the Central Plateau. ORP and its principal contractors and their respective responsibilities include the following:

- ⊗ [Advanced Technologies and Laboratories International, Inc.](#) (ATL) was awarded the Laboratory Analytical Services and Testing contract in 2009. ATL operates the 222-S Laboratory Complex, the primary onsite laboratory for analysis of highly radioactive samples in support of all Hanford projects. Located in the 200-West Area, this laboratory is equipped and staffed to receive, analyze, and store samples and report analytical results to the appropriate contractor. Technicians test some 25,000 samples of materials in support of the Hanford cleanup mission every year.
- ⊗ [Bechtel National Inc.](#) (BNI) was awarded the contract to design, construct, and startup the WTP in 2000. Construction of WTP is the largest of its kind in the world. When complete, the WTP will be used to transform the approximately 53 million gallons (200 million liters) of radioactive and chemical wastes being stored in underground tanks at the Hanford 200 Area into a stable glass form for permanent disposal.
- ⊗ [Washington River Protection Solutions LLC](#) (WRPS) was awarded the Tank Operations Contract in 2008. WRPS is made up of the URS Corporation, Energy Solutions, and AREVA as the primary subcontractor. WRPS is responsible for safely managing the underground waste storage tanks until the waste is prepared for disposal. The waste is stored in 149 older single-shell tanks and 28 newer and

safer double-shell tanks that are grouped into 18 farms located in the 200 Area on the Hanford Site Central Plateau.

The **Office of Science** manages DOE's science and technology programs, goals, and objectives at the Hanford Site. Its principal contractor is Pacific Northwest National Laboratory (PNNL), described below:

- ⊙ [PNNL](#), operated by Battelle Memorial Institute for DOE, was awarded the Laboratory contract in 1965 and is one of 10 DOE national laboratories managed by the Office of Science. PNNL is responsible for conducting research and delivering scientific solutions from multiple scientific disciplines to solve energy, environmental, and national security challenges. PNNL supports not only DOE, but the U.S. Department of Homeland Security, National Nuclear Security Administration, and other government agencies, universities, and industry.

## 1.5 Climate and Meteorology

*PJ Perrault*

The Hanford Meteorology Station is located at the Hanford Site Central Plateau. Researchers take meteorological measurements to support Hanford Site operations, emergency preparedness and response, and atmospheric dispersion calculations for dose assessments. Support is provided through weather forecasting and by maintaining and distributing climatological data. Forecasting is provided to help manage weather-dependent operations. Climatological data are provided to help plan weather-dependent activities and to assess the environmental effects of site operations.

Hanford Meteorology Station staff rely on data provided by the Hanford Meteorological Monitoring Network. This network consists of 28 remote monitoring stations that transmit data to the Hanford Meteorology Station through radio telemetry every 15 minutes. There are 2 towers that are 10 feet (3 meters) high, 24 towers that are 30 feet (9 meters) high, and 3 towers that are 200 feet (61 meters) high. Meteorological information collected at these stations includes wind speed, wind direction, temperature, precipitation, atmospheric pressure, dewpoint temperature, wet-bulb global temperature (WBGT), solar radiation, relative humidity, and subsurface soil temperature; however, not all these data are collected at all stations.

Regional temperatures, precipitation, and winds are affected by mountain barriers. The Cascade Range, beyond Yakima to the west, greatly influences the climate of the Hanford Site because of its rain-shadow effect. The Rocky Mountains and ranges in southern British Columbia in Canada protect the region from severe, cold polar air masses moving southward across Canada and winter storms associated with them.

Prevailing wind direction in the Central Plateau is from the northwest all year long. The secondary wind direction is from the southwest. Summaries of wind directions indicate that winds from the northwestern quadrant occur most often during winter and summer. During spring and fall, the frequency of southwesterly winds increases, with a corresponding decrease in the northwesterly flow. Monthly average wind speeds are lowest during winter months, averaging about 6 to 7 miles per hour (3 meters per second), and highest during summer, averaging about 8 to 9 miles per hour (4 meters per second).

Wind speeds well above average are usually associated with southwesterly winds. However, summertime drainage winds are generally northwesterly and frequently exceed 30 miles per hour (13 meters per

second). These winds are most prevalent over the northern portion of the Hanford Site. Figure 1.2 shows the 2014 wind roses (i.e., diagrams showing direction and frequencies of wind) measured at a height of 30 feet (9 meters) for the 28 meteorological monitoring stations located at and around the Hanford Site.

Atmospheric dispersion is a function of wind speed, wind duration and direction, atmospheric stability, and mixing depth. Dispersion conditions are generally good if winds are moderate to strong, the atmosphere is of neutral or unstable stratification, and there is a deep mixing layer. Good dispersion conditions associated with neutral and unstable stratification exist approximately 57 percent of the time during summer. Less-favorable conditions may occur when wind speed is light and the atmospheric dispersion-mixing layer is shallow. These conditions are most common during winter when moderate to extremely stable stratification exists (approximately 66 percent of the time). Occasionally, there are extended periods of poor dispersion conditions, primarily during winter, that are associated with stagnant air in stationary high-pressure systems.

### **1.5.1 Historical Climatological Information**

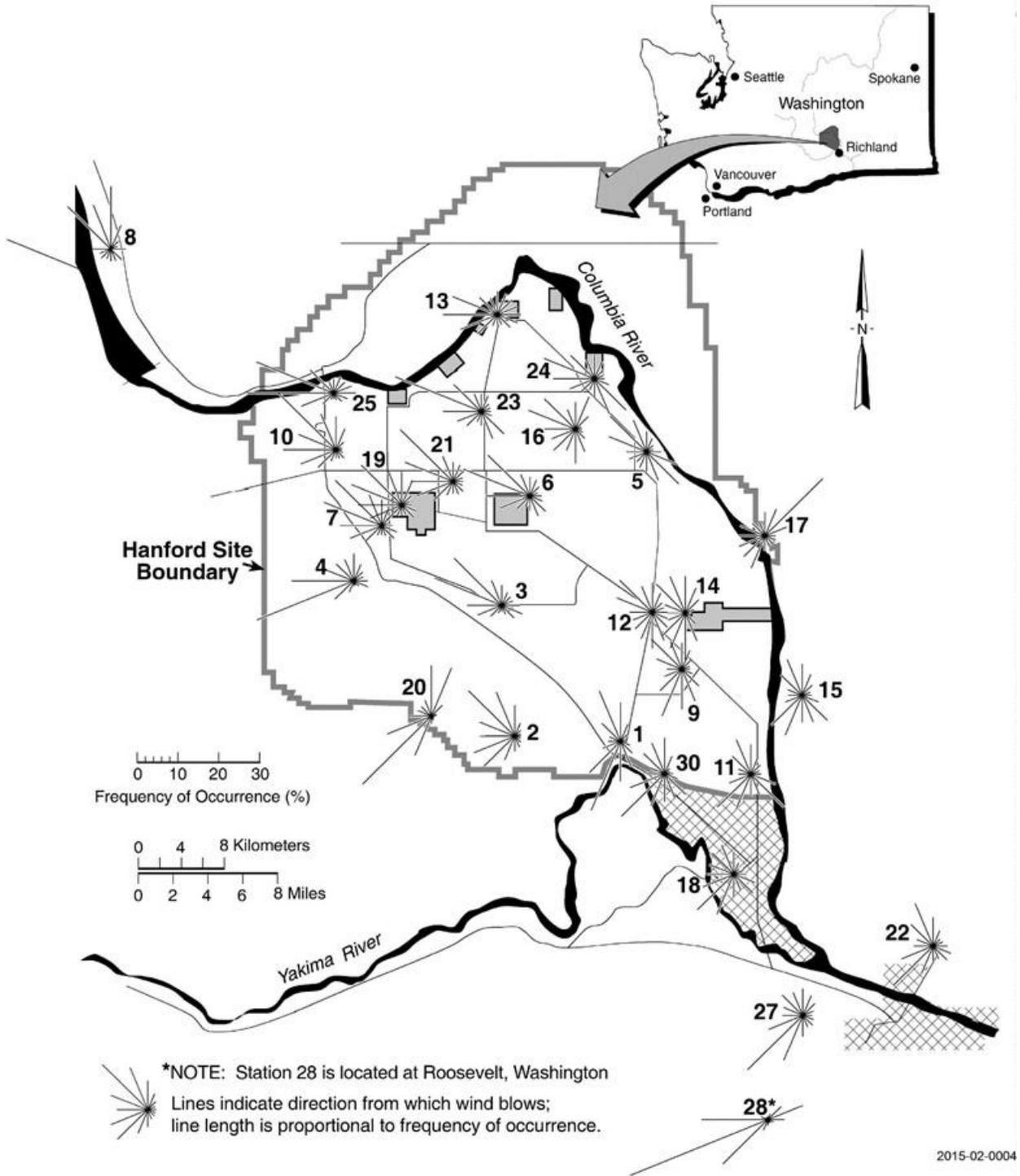
The following climatological information is for the Hanford Meteorological Station covering the period 1945 through 2014.

The normal annual average temperature at the Hanford Meteorological Station is 53.9° Fahrenheit (F) [12.2° Celsius (C)]. The monthly average temperature ranges from a high of 77.1°F (25.1°C) in July to a low of 31.1°F (-0.5°C) in December. The record highest monthly average temperature is 82.8°F (28.2°C) recorded in July 2014, and the record lowest monthly average temperature is 12.1°F (-11.1°C) recorded in January 1950. The highest daily temperature ever recorded at the Hanford Meteorological Station is 113°F (45°C) on three separate occasions: August 1961, July 2002, and July 2006. The lowest daily temperature ever recorded has been -23°F (-31°C) in February 1950.

The normal annual relative humidity at the Hanford Meteorological Station is 55.3 percent. Relative humidity is highest during winter (Dec-Jan), averaging 77.2 percent, and lowest during summer (Jun-Aug), averaging 36.5 percent. The record highest monthly average relative humidity is 90.5 percent recorded in December 1950. The record lowest monthly average relative humidity is 21.9 percent recorded in July 1959. The hourly relative humidity has ranged from 100 percent to 6 percent.

Normal annual precipitation at the Hanford Meteorological Station is 7.08 inches (17.98 centimeters). Most precipitation occurs during the winter, with more than half of the annual amount occurring from November through February. The wettest year on record, 1995, received 12.31 inches (31.23 centimeters) of precipitation; the driest, 1976, received 2.99 inches (7.59 centimeters). The highest 24 hour total of precipitation is 1.91 inches (4.9 centimeters) recorded in October 1957. The normal seasonal snowfall is 15.3 inches (38.9 centimeters). The record highest seasonal snowfall total is 56.1 inches (142.5 centimeters) recorded in the 1992-1993 season. The record lowest seasonal snowfall total is 0.3 inch (0.8 centimeter) recorded in the 1957-1958 season. The most snowfall from a single storm is 12.4 inches (31.5 centimeters) recorded in February 1993. The record for snow depth is 15.6 inches (39.6 centimeters) in December 1985.

Figure 1.2. Meteorological Monitoring Network Wind Roses  
 Measured at a height of 30 feet [9 meters]



2015-02-0004

The normal annual wind speed at the Hanford Meteorological Station is 7.6 miles per hour (3.4 meters per second). The monthly average wind speed ranges from a high of 9.0 miles per hour (4.0 meters per

second) in June to a low of 5.9 miles per hour (2.6 meters per second) in December. The record highest monthly average wind speed is 11.1 miles per hour (5.0 meters per second) on multiple dates: April 1959 and 1972, and February 1999. The record lowest monthly average wind speed is 2.9 miles per hour (1.3 meters per second) in November 1956 and January 1985. The record highest daily wind speed is 33.7 miles per hour (15.1 meters per second) recorded in January 1972, and the record lowest daily wind speed is 0.3 mile per hour (0.1 meter per second) in January 1982 and November 1989. The record highest peak wind gust is 80 miles per hour (36 meters per second) in January 1972. The record highest hourly wind speed is 51 miles per hour (23 meters per second) in January 1972.

The normal annual station pressure at the Hanford Meteorological Station is 29.213 inches of mercury. The monthly average station pressure ranges from a high of 29.329 inches in December to a low of 29.129 inches in August. The record highest monthly station pressure is 29.638 inches in December 1985, and the record lowest monthly station pressure is 28.999 inches in February 1998. The record highest hourly station pressure is 30.23 inches (adjusted sea level pressure of 1053.8 millibars) in January 1979. The record lowest hourly station pressure is 28.10 inches (adjusted sea level pressure of 977.3 millibars) in December 1951.

Daily and monthly averages and extremes of ambient temperature, dew point temperature, wet bulb temperature, pressure, wind, precipitation, sky cover, fog, solar radiation, relative humidity, thunderstorms, and other miscellaneous weather phenomena for 1945 through 2004 are reported in *Climatological Summary 2004 with Historical Data* ([PNNL-15160](#)).

### 1.5.2 Monitoring

The average temperature for 2014 was 56.1 °F (13.4 °C), which was 2.2 °F above normal. This made 2014 the fifth warmest year on record. During 2014, 10 months were warmer than normal, 2 months were cooler than normal, and December had the greatest positive departure at 5.9 °F above normal. July and October were 5.7 °F and 5.6 °F above normal. February had the greatest negative departure at -4.3 °F below normal. July's monthly average temperature of 82.8 °F (28.2 °C) was an all-time record for highest monthly temperature.

Precipitation totaled 6.53 inches (16.59 centimeters), which is 92 percent of normal precipitation (7.08 inches [17.98 centimeters]). Greatest monthly total of precipitation was 1.12 inches (2.84 centimeters) in February, and lowest monthly total was 0.04 inch (0.10 centimeter) in July. March 27-28, had the greatest 24-hour precipitation at 0.50 inch (1.27 centimeters). This included 0.21 inch (0.53 centimeter) that fell in 35 minutes. Snowfall for 2014 totaled 14.8 inches (37.6 centimeters), which is 97 percent of normal (15.3 inches ([38.6 centimeters])). This included 11.9 inches (30.2 centimeters) that fell in February for the fifth snowiest February on record. On March 27 and August 2, a trace amount of hail [0.25 inch (0.64 centimeter)] fell at the Hanford Meteorological Station. The average is approximately 1 occurrence of hail every 2 years.

Average wind speed was 8.4 miles per hour (3.8 meters per second), which was 0.8 mile per hour (0.4 meter per second) above normal. This ties for the second highest annual average wind speed on record. The peak gust for the year was south-southwest at 66 miles per hour (30 meters per second) and occurred on January 11. This was the third highest gust ever recorded in January. The peak gust of 55

miles per hour (25 meters per second) recorded on July 23, out of the west-southwest, tied for the third highest gust ever recorded for July. The peak gust recorded on August 12, of 61 miles per hour (27 meters per second) out of the southwest, is the second highest gusts ever recorded for August. Each of these events caused blowing dust with reduced visibility, dropping to as low as 0.75 mile in August. In November, the highest wind recorded on Rattlesnake Mountain was a sustained southwest wind of 79 miles per hour (35 meters per second) with gusts to 95 miles per hour (42 meters per second).

A record for the longest growing season ever recorded was set in 2014. The last frost in the spring was March 31, and the first frost in the fall was November 11. This made the growing season 224 days, which surpassed the previous record of 216 days in 1994.

Monthly and annual climatological data collected at the Hanford Meteorology Station is provided in Table 1.1. Real-time and historical data from the Hanford Meteorology Station are available at <http://www.hanford.gov/hms>. The website data includes hourly weather observations, 15-minute data, monthly climatological summaries, and historical data

## 1.6 Stakeholder Involvement

DOE encourages information exchange and public involvement in discussions and decision making regarding Hanford Site cleanup and remediation actions. Active participants include the public; Native American tribes; local, state, and federal government agencies; advisory boards; activist groups; and other entities in the public and private sectors. The roles and involvement of selected stakeholders are described in the following sections.

### 1.6.1 Role of Native American Tribes

*JA Conrad*

The role of Native American tribes at the Hanford Site is guided by *Department of Energy American Indian Tribal Government Interactions and Policy* ([DOE O 144.1](#)), which communicates departmental, programmatic, and field responsibilities for interacting with American Indian governments. This order incorporates both policy and consultation guidance in working with Native American tribes. DOE will consult with any American Indian or Alaska Native tribal government with regard to any property to which that tribe attaches religious or cultural importance, which might be affected by a DOE action. The policy outlines the trust relationship that DOE has with Native American tribes and commits the agency to institute government-to-government relations with the tribes. [DOE O 144.1](#), Attachment 3, “Offices of Environmental Management, Science, Nuclear Energy, and the National Nuclear Security Administration Framework for Implementing the Department of Energy’s American Indian and Alaska Native Policy,” provides additional guidance on how tribal consultation is to be conducted.

**Table 1.1. Meteorology Station Monthly and Annual Climatological Data**

*Hanford Meteorology Station, 25 miles (40 kilometers) northwest of Richland, Washington  
latitude 46° 34'N, longitude 119° 35'W, elevation 733 feet (223 meters)*

Month	Temperature, °F									Precipitation (inches)				Relative Humidity (%)		15-m Wind <sup>a</sup>				
	Averages			Extremes								Snowfall				Peak Gusts				
	Daily Maximum	Daily Minimum	Monthly	Departure <sup>b</sup>	Highest	Date	Lowest	Date	Total	Departure <sup>b</sup>	Total	Departure <sup>b</sup>	Average	Departure <sup>b</sup>	Average Speed (mph)	Departure <sup>b</sup>	Speed (mph)	Direction	Date	
Jan	41.5	28.9	35.2	+1.8	59	13	18	4	0.37	-0.57	0.4	-3.0	79.2	-0.6	6.2	-0.1	66	SSW	11	
Feb	41.9	25.9	33.9	-4.3	61	12	4	7	1.12	+0.42	11.9	-2.3	67.8	-2.9	8.4	+1.5	52	SW	18	
Mar	59.6	35.6	47.6	+1.1	70	15	19	3	1.00	+0.43	1.5	-0.4	53.4	-3.8	9.1	+1.2	48	WNW	17	
Apr	68.3	42.5	55.4	+1.9	82	30	33	14	0.38	-0.17	0	0	41.7	-6.6	9.7	+1.2	46	SW	19	
May	79.7	51.5	65.6	+3.5	91	15	44	12 <sup>c</sup>	0.24	-0.27	0	0	35.3	-7.9	9.4	+0.6	41	WNW	16	
Jun	84.6	57.1	70.9	+1.3	95	23	48	21	0.26	-0.25	0	0	34.0	-5.6	10.1	+1.1	42	NW	10	
Jul	98.4	67.2	82.8	+5.7	110	16	54	25 <sup>c</sup>	0.04	-0.14	0	0	25.8	-8.3	8.8	+0.2	55	WSW	23	
Aug	93.3	65.0	79.2	+3.4	104	5 <sup>c</sup>	58	24	0.88	+0.70	0	0	35.6	-0.1	8.2	+0.2	61	SW	12	
Sep	82.7	55.6	69.2	+2.8	93	21	47	14	0.16	-0.15	0	0	39.2	-3.8	8.4	+1.1	42	WNW	30	
Oct	70.0	47.5	58.7	+5.6	93	6	38	29 <sup>d</sup>	0.77	+0.28	0	0	59.5	+3.4	7.6	+0.9	52	SW	25	
Nov	46.6	28.9	37.8	-2.7	69	4	8	30	0.38	-0.57	0.9	-2.0	70.8	-3.1	7.3	+0.6	56	SW	28	
Dec	43.7	30.4	37.0	+5.9	59	21	8	31	0.93	-0.27	0.1	-5.5	78.0	-3.2	7.0	+1.1	43	SW	20	
Year <sup>d</sup>	67.5	44.7	56.1	+2.2	110	Jul 16	4	Feb 7	6.53	-0.55	14.8	-0.5	51.7	-3.6	8.4	+0.8	66	SSW	Jan 11	

Note: Refer to Appendix A, Table A.2, Conversion Table, in the Helpful Information section for unit conversion information.

<sup>a</sup> Measured on a tower 50 feet (15 meters) above ground.

<sup>b</sup> Departure columns indicate positive or negative departure of meteorological parameters from 30-year (1981-2010) climatological normal.

<sup>c</sup> Latest of multiple occurrences.

<sup>d</sup> Yearly averages, extremes, and totals.

The U.S. government has a unique political and legal relationship with tribal governments as defined by treaties, the U.S. Constitution, court decisions defining the federal trust responsibility, and executive orders. Additional federal laws and regulations requiring DOE to consult with Native American tribes on certain issues include the *American Indian Religious Freedom Act*, the *National Environmental Policy Act of 1969* (NEPA), *Archaeological Resources Protection Act of 1979*, *National Historic Preservation Act of 1966* (NHPA) ([16 USC 470](#)), and *Native American Graves Protection and Repatriation Act of 1990*.

As Hanford Site cleanup progresses, Native American tribes review various aspects of cleanup activities, including how these activities will affect cultural, natural, and biological resources, and the tribes' future ability to use and consume the resources that once existed at the site.

DOE works primarily with four Native American tribes. The Confederated Tribes and Bands of the Yakama Nation, Confederated Tribes of the Umatilla Indian Reservation ([CTUIR](#)), and the Nez Perce Tribe negotiated treaties with the U.S. government in 1855 (*Treaty with the Nez Perce, 1855*; *Treaty with the Walla Walla, Cayuse, etc., 1855*; *Treaty with the Yakama, 1855*). Each treaty included provisions that reserved the rights of Native American tribes to fish at all usual and accustomed places, hunt, gather roots and berries, and pasture horses and cattle on open and unclaimed land, among other rights.

The Wanapum Band, located in Priest Rapids, once resided on lands that are now the Hanford Site.

The Wanapum have historic ties to the site and a longstanding relationship with DOE.

DOE provides financial assistance through cooperative agreements with the Confederated Tribes and Bands of the Yakama Nation, [CTUIR](#), and the Nez Perce Tribe to support tribal involvement in decisions made at Hanford. Funding enables Native American tribes to retain staff to facilitate reviews and comment on site-related draft documents and plans, as well as participate in meetings and activities. Tribal experts in tribal culture, history, and resources often contribute their insight and expertise to Hanford Site decision-making processes and activities. Further information regarding the DOE Tribal Affairs Program is available on the following website: <http://www.hanford.gov/page.cfm/inp>.

## 1.6.2 Cultural and Historic Resource Consultations

*MK Wright*

The NHPA ([16 USC 470](#)) requires DOE to consult with the Washington State Historic Preservation Officer, Native American tribes, local government representatives, the public, and other interested parties on cultural and historic resource matters. Regulations require that DOE solicit and gather input from Native American tribes and interested parties, obtain concurrence from the Washington State Historic Preservation Officer on the identification of cultural resources, evaluate the significance of these resources, and assess impacts of DOE activities on cultural resources. The *Hanford Cultural Resources Management Plan* ([DOE/RL-98-10](#)) provides guidance to DOE on cultural and historic resources issues.

DOE's Cultural and Historic Resource Protection ([CHRP](#)) program consults with the Washington State Historic Preservation Officer, the [Confederated Tribes and Bands of the Yakama Nation](#), the [CTUIR](#), the [Nez Perce Tribe](#), and the [Wanapum](#) through individual meetings and discussions, field walk-downs, and project comment resolution. Tribal cultural experts discuss project scope and design on a monthly basis with DOE, tribal representatives, and other interested parties.

DOE also consults with the Washington State Historic Preservation Officer and other parties that express an interest in historic resources located on the Hanford Site, including groups such as the B Reactor

Museum Association, White Bluffs Pioneers, Benton County Historical Society, East Benton County Historical Museum, and Franklin County Historical and Museum Society.

### 1.6.3 Hanford Natural Resource Trustee Council

#### *TC Post and SH Witness*

The *Comprehensive Environmental Response, Compensation and Liability Act of 1980* (CERCLA) ([42 USC 9601](#)) and implementing regulations in [40 CFR 300](#), “National Oil and Hazardous Substances Pollution Contingency Plan,” establish DOE as both the CERCLA lead response agency at departmental facilities and a trustee for natural resources under its jurisdiction. As the lead response agency, DOE is mandated to conduct response actions to correct or mitigate threats to human health and the environment that result from the release of hazardous substances during the execution of its assigned missions. CERCLA also provides authority for assessment and restoration of natural resources that have been damaged by a hazardous substance release or response.

Under CERCLA, the United States is liable for damages or injury to, destruction of, or loss of natural resources resulting from release of hazardous substances or from removal or remedial activities made necessary because of such releases, including the cost of assessing such damage. The President of the United States, by [Executive Order 12580](#), *Superfund Implementation*, appointed the Secretary of Energy as the primary trustee for all natural resources located on, over, or under land administered by DOE, including the Hanford Site.

Natural resource trustees are government officials who act on behalf of the public when there is injury to, destruction of, loss of, or threat to natural resources (for which they have management responsibility) because of the release of a contaminant. Federal, state, and tribal entities are authorized to act as trustees pursuant to CERCLA, Section 301(c), which covers natural resource damage assessments (NRDA).

The trustees for the Hanford Site include:

- ⊗ DOE on behalf of the U.S. federal government
- ⊗ U.S. Department of the Interior through the USFWS
- ⊗ U.S. Department of Commerce through the National Oceanic and Atmospheric Administration
- ⊗ State of Washington (through Ecology) in consultation with the WDFW
- ⊗ State of Oregon through the Oregon Department of Energy
- ⊗ Confederated Tribes and Bands of the Yakama Nation (Yakama Nation)
- ⊗ CTUIR
- ⊗ Nez Perce Tribe.

The [Hanford Natural Resource Trustee Council](#) (Council) was established in 1996 via a [memorandum of agreement](#) (DOE et al. 1996), and is a voluntary association of trust organizations. Members collaborate and coordinate on many issues, documents, and actions concerning natural resources. The primary purpose of the council is to facilitate the coordination and cooperation of the trustees in their efforts to mitigate effects to natural resources that result from either hazardous substance releases on the Hanford Site or remediation of those releases. The council has adopted bylaws to direct the process of arriving at consensus on all substantive decisions.

Hanford NRDA work in fiscal year (FY) 2014 focused primarily on continuation of injury studies initiated in prior years and planning for implementation of the Injury Assessment Plan, with a goal of completing injury assessment and preparing a Restoration Plan by 2024. Planning efforts resulted in the completion of a project execution plan. The project execution plan defines the overall work scope, schedule, and budget for the Hanford injury assessment and establishes the means to execute, monitor, and control the project in a disciplined manner. The project execution plan is a 'living document' that will be updated annually based on actual budgets and new information gained from the injury assessment process.

In 2014, the Council continued to meet monthly to plan, organize, implement, and direct Hanford NRDA activities. Technical work groups also met on a regular basis to assist in developing and overseeing studies, reviewing environmental/contaminant release data, and making recommendations to the Council. Each technical work group prepared, and the Council approved, updated five-year work plans providing a prioritized list of tasks, task descriptions, and sequencing information for work within the technical work group.

Initial injury studies are in various stages of completion. In 2014, a final report summarizing results of a Groundwater Contaminant Plume Mapping Study was drafted by the U.S. Geological Survey (USGS) contractor, and the USGS continued to work on the Mussel Toxicity Study, a significant accomplishment during the year. The study compared contaminant concentrations in soils, sediment, and surface water to literature-based injury thresholds. The effort used a substantial amount of existing data, comparing Hanford contaminants of concern concentrations to thresholds in literature and identifying data gaps that will aid the Council in prioritizing and focusing future studies and data collection efforts. Three tribal service loss studies have been approved by the Council, and all three are underway.

In 2014, the Restoration Technical Work Group continued to identify, screen, and develop potential early restoration projects focused mainly on terrestrial resources. Field visits were conducted to observe habitat conditions at some of the proposed project locations. Criteria for the evaluation of early restoration pilot project sites were refined. The Restoration Technical Work Group took the lead in planning and convening a workshop in June to explore streamlined injury assessments and early restoration based on lessons learned from other NRDA sites across the country. It is anticipated that initial restoration projects will be implemented as pilot sites to help develop and refine the Trustee's technical and logistic capability for ecological restoration.

Information about the Council, including its objectives, history, and projects, is available online at <http://www.hanford.gov/page.cfm/hnrctc>.

#### **1.6.4 Public Involvement in Hanford Site Decisions**

*K Skopeck*

RL and ORP believe public involvement is essential to the ultimate success of Hanford Site cleanup. Both field offices have staff that coordinate, plan, and schedule public participation activities for DOE on the Hanford Site.

The *Hanford Public Involvement Plan* ([TPA 2012a](#)), previously known as the *Community Relations Plan*, outlines the public participation processes used by the Tri-Party Agencies and outlines ways the public can be involved in Hanford Site cleanup decision-making processes and serves as the overall guidance

document for public participation and outreach activities at Hanford. The first plan was developed and approved with public input in 1990 and was last revised in November 2012.

A key goal of public involvement is to facilitate broad-based participation and obtain stakeholder and public perspectives on Hanford Site cleanup decisions. DOE uses various forums to inform the public of upcoming public involvement and participation opportunities. These include, but are not limited to, the following:

- ⊙ *Hanford Cleanup Line.* Staff administering the Hanford Cleanup Line at (800) 321-2008 respond to information requests about the TPA cleanup activities. The Tri-Party Agencies strive to provide a timely response to all requests. The line is advertised frequently in a variety of ways, including TPA announcements; media information such as newspaper articles, brochures, and meeting notices; and Hanford Site fact sheets.
- ⊙ *Listserv Notices and Printed Mailings.* The Tri-Party agencies use a Listserv to communicate electronically about upcoming public involvement activities, along with information on ways to be involved in Hanford cleanup decisions. It's our goal to "Go Green" and reduce the environmental impact of paper mailings, but we understand that some people want to get information by mail. To be added to the Listserv or to the printed mailing list, send an email to [Hanford@ecy.wa.gov](mailto:Hanford@ecy.wa.gov). Or, call the Hanford Cleanup Line at (800) 321-2008.
- ⊙ *Hanford Site Public Involvement Activities.* The Hanford Site Events Calendar is available at the following website: <http://www.hanford.gov>. The calendar provides an overview of public involvement opportunities for the coming months and identifies current forums and emerging opportunities to inform and involve stakeholders and the public.
- ⊙ *Tri-Party Agencies Public Involvement Calendar for the Hanford Site.* This calendar is available online at [http://www.ecy.wa.gov/programs/nwp/PI/pdf/TPA\\_PI\\_Calendar.pdf](http://www.ecy.wa.gov/programs/nwp/PI/pdf/TPA_PI_Calendar.pdf). It provides a 12-month overview of upcoming key public involvement activities, including the Hanford Advisory Board (HAB) meeting dates and locations.
- ⊙ *Hanford Site Informational Links.* Information concerning Hanford Site events, issues, cleanup activities, and public involvement opportunities is available at the following website: <http://www.hanford.gov/>.
- ⊙ *Comment and Response Documents.* Following a DOE or TPA public comment period, a comment and response document is developed to record public comments received on an issue. Comment and response documents are distributed to members of the public who provide comments or request a copy. These documents are available at the DOE Public Reading Room (Washington State University Tri-Cities Consolidated Information Center, 2710 University Drive, Richland, Washington); on the TPA Administrative Record website at <http://pdw.hanford.gov/arpir/>; and, for proposed changes to the TPA that underwent public comment, on the TPA website at <http://www.hanford.gov/?page=81>.
- ⊙ *Informational Public Meetings.* All TPA quarterly public involvement planning meetings, semiannual meetings, special meetings, and workshops are open to the public. In addition, the Tri-Party Agencies welcome opportunities for co-sponsoring meetings organized by local, state, and tribal governments and citizen groups.

Hanford Site cleanup documents are also available to the public through the TPA Administrative Record and Public Information Repository available at <http://pdw.hanford.gov/arpir/>. Responsible federal and state governments provide the public a variety of opportunities to offer input and influence Hanford Site cleanup decisions including informal and formal public comment periods, such as those described in [Ecology et al. 1989a](#), CERCLA, RCRA, and NEPA; HAB meetings; State of the Hanford Site presentations; and other Hanford Site-related public involvement and information meetings, workshops, or activities.

For more information about Hanford Site cleanup activities, contact the Tri-Party Agencies at the following contact numbers:

RL	(509) 376-7501
ORP	(509) 372-8656
Hanford Site Cleanup Line/Ecology	(800) 321-2008
EPA	(509) 376-8631

For more information about Hanford Site public involvement, visit the Hanford Site website at <http://www.hanford.gov>.

### 1.6.5 State of Oregon

*K Skopeck*

DOE recognizes the State of Oregon's unique role and interests at the Hanford Site, and its concerns to protect Columbia River resources. DOE is interested in sharing, facilitating, and accommodating the exchange of information with the State of Oregon. RL and ORP entered into a [Memorandum of Understanding](#) in 2004, with the State of Oregon to consult, and whenever possible, cooperate on Hanford Site environmental issues. DOE will consult with and include the Oregon Department of Energy in planning and conducting Hanford Site-related public involvement activities in the State of Oregon.

### 1.6.6 Hanford Advisory Board (HAB)

*K Skopeck*

The HAB is a broadly representative body consisting of a balanced mix of members that represent diverse interests affected by Hanford Site cleanup decisions. The HAB was created in 1994 by the Tri-Party Agencies and ultimately chartered as one of eight environmental management site-specific advisory boards across the country. The HAB comprises 32 members and their alternates, including representatives from the Nez Perce Tribe and the Confederated Tribes and Bands of the Yakama Nation. A representative of the CTUIR participates on the board in an ex-officio status. Current members with their affiliations are listed on the HAB website at <http://www.hanford.gov/page.cfm/hab>.

The HAB assists the broader public in becoming more informed and meaningfully involved in Hanford Site cleanup decisions through its open public meetings. Board members' formal advice on cleanup issues reflects the values of its constituents. Copies of their advice and DOE's responses are on the HAB website for Advice and Responses at <http://www.hanford.gov/?page=453>.

Information about the HAB, including its charter (operating ground rules) is available on the HAB website for Operating Ground Rules at <http://www.hanford.gov/?page=449>.

## 1.7 Hanford Site Regulatory Oversight

*SA Thompson*

Several federal, state, and local regulatory agencies are responsible for monitoring and enforcing compliance with applicable environmental regulations at the Hanford Site, including EPA, Ecology, Washington State Department of Health (WDOH), and the Benton Clean Air Agency. EPA is the primary federal regulatory agency that develops, promulgates, and enforces environmental regulations and standards as directed in federal statutes. In some instances, EPA has delegated authority to the state or authorized the state program to operate in lieu of the federal program when the state's program meets or exceeds EPA requirements. In other activities, the state program is assigned direct environmental oversight of the DOE program, as provided by federal law. Where federal regulatory authority is not delegated or only partially authorized to the state, the EPA Pacific Northwest Regional Office (Region 10) is responsible for reviewing and enforcing compliance with EPA regulations as they pertain to the Hanford Site. EPA periodically reviews state environmental programs and may directly enforce federal environmental regulations.

### 1.7.1 Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement)

*RE Piippo and CP Noonan*

The TPA ([Ecology et al. 1989a](#)) is an agreement among the Tri-Party Agencies to achieve environmental regulation compliance on the Hanford Site with CERCLA and RCRA treatment, storage, and disposal (TSD) unit regulations and corrective action provisions. The TPA is an interagency agreement under CERCLA, Section 120, a corrective action order under RCRA, and a consent order under the Washington State *Hazardous Waste Management Act of 1976* (RCW 70.105) that 1) defines RCRA and CERCLA cleanup commitments, 2) establishes responsibilities, 3) provides a basis for budgeting, and 4) reflects a concerted goal to achieve regulatory compliance and remediation with enforceable milestones. Attachment 2 of the TPA, the Action Plan ([Ecology/EPA/DOE 1989b](#)), describes how public information and involvement activities are conducted for TPA decisions.

The TPA has evolved as Hanford Site cleanup has progressed. Since its initial publication in 1989, the Tri-Party Agencies have negotiated changes to the agreement to meet the changing conditions and needs of cleanup activities on the Hanford Site. All significant changes undergo a process of public involvement designed to enhance communication and address public concerns prior to final approvals. Revision 8 of the TPA was published in July 2011. As new change control forms are approved through the TPA change control process, they are incorporated into the TPA and available online at: <http://www.hanford.gov/?page=81>. Printed copies of Revision 8 of the TPA are publicly available at DOE's Public Reading Room located in the Washington State University Tri-Cities Consolidated Information Center, 2770 University Drive, Richland, Washington, and at public information repositories in Seattle and Spokane, Washington, and Portland, Oregon. To be placed on the mailing list to obtain TPA information, call the Hanford Cleanup Line at (800)321-2008 or send an e-mail to [hanford-info@listserv.wa.gov](mailto:hanford-info@listserv.wa.gov).

#### 1.7.1.1 Tri-Party Agreement Milestone Status

The TPA commits DOE to comply with the remedial-action provisions of CERCLA as well as with [Resource Conservation and Recovery Act of 1976](#) (RCRA) TSD unit regulations and corrective-action

provisions, including Washington State’s implementing regulations ( *Washington Administrative Code* [[WAC](#)] [173-303](#), “Dangerous Waste Regulations”). From 1989 through January 19, 2015, a total of 1,235 TPA milestones were completed, and 334 target dates were met. During 2014, 30 specific cleanup milestones were scheduled for completion; of those, 27 milestones were completed on time, 1 milestone was missed, and 2 milestones are in dispute resolution.

### 1.7.1.2 Tri-Party Agreement Approved Modifications

During 2014, 12 negotiated change control forms to the TPA were approved; these changes can be viewed on the TPA website at <http://www.hanford.gov/c.cfm/tpa/>.

## 1.8 Additional Hanford/Area Websites

SA Thompson

Company	Website
AREVA NP Inc.	<a href="http://www.aveva.com/en/operations-925/aveva-inc--richland-nuclear-fuel-production.html">http://www.aveva.com/en/operations-925/aveva-inc--richland-nuclear-fuel-production.html</a>
Battelle Memorial Institute	<a href="http://www.battelle.org/">http://www.battelle.org/</a>
City of Kennewick	<a href="http://www.go2kennewick.com/">http://www.go2kennewick.com/</a>
City of Pasco	<a href="http://www.pasco-wa.gov/">http://www.pasco-wa.gov/</a>
City of Richland	<a href="http://www.ci.richland.wa.us/">http://www.ci.richland.wa.us/</a>
City of West Richland	<a href="http://www.westrichland.org/">http://www.westrichland.org/</a>
Environmental Molecular Sciences Laboratory	<a href="http://www.emsl.pnl.gov/emslweb/">http://www.emsl.pnl.gov/emslweb/</a>
ERDF	<a href="http://www.hanford.gov/page.cfm/erdf">http://www.hanford.gov/page.cfm/erdf</a>
Geology of Washington, Columbia Basin	<a href="http://www.dnr.wa.gov/researchscience/topics/geologyofwashington/pages/columbia.aspx">http://www.dnr.wa.gov/researchscience/topics/geologyofwashington/pages/columbia.aspx</a>
Hanford Reach National Monument	<a href="http://www.fws.gov/refuge/hanford_reach/">http://www.fws.gov/refuge/hanford_reach/</a>
Hanford Site Tours	<a href="http://www.hanford.gov/page.cfm/hanfordsitetours">http://www.hanford.gov/page.cfm/hanfordsitetours</a>
Lockheed Martin Corporation	<a href="http://www.lockheedmartin.com/">http://www.lockheedmartin.com/</a>
Mission Support Alliance	<a href="https://msa.hanford.gov">https://msa.hanford.gov</a>
Pacific Northwest National Laboratory	<a href="http://www.pnnl.gov">http://www.pnnl.gov</a>
Pacific Northwest Seismic Network	<a href="http://pnsn.org/">http://pnsn.org/</a>
Perma-Fix Northwest, Inc.	<a href="http://www.perma-fix.com/facilities/pf_nuclear_richland/">http://www.perma-fix.com/facilities/pf_nuclear_richland/</a>
Port of Benton	<a href="http://www.portofbenton.com/">http://www.portofbenton.com/</a>
Tri-Cities Visitor & Convention Bureau	<a href="http://www.visittri-cities.com/">http://www.visittri-cities.com/</a>
URS Corporation	<a href="http://www.urscorp.com/">http://www.urscorp.com/</a>
US Ecology, Inc.	<a href="http://www.americaneecology.com/richland.htm">http://www.americaneecology.com/richland.htm</a>
Volpentest HAMMER Federal Training Center	<a href="http://www.hammertraining.com/">http://www.hammertraining.com/</a>
Washington Department of Fish and Wildlife	<a href="http://wdfw.wa.gov/">http://wdfw.wa.gov/</a>

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