Washington State History
7th Grade

Completing this packet meets the graduation requirement for Washington State History.

This packet contains two units:

Unit 1: New Technologies and Industries:
Hanford Nuclear Reservation's Effects on Indian Country
Pages 2-34

and

Unit 2: The Constitution and Government of Washington State
Pages 35-45

Adapted from:
Since Time Immemorial curriculum
OSPI Developed Assessments
The State We’re In: Washington, League of Women Voters
The Constitution and Government of Washington State, OER Unit
Washington State Historical Society, Woman’s Suffrage
Unit 1: New Technologies and Industries: 
Hanford Nuclear Reservation's Effects on Indian Country

The Effects of the Hanford Nuclear Reservation on Pacific Northwest Tribes Research Project

Introduction
The Hanford Nuclear Reservation was an important part of the development of nuclear materials in the middle part of the 20th century. Most of the nuclear materials created at Hanford were used in the making of nuclear weapons. The effects of Hanford on the Tribes whose lands are on or near Hanford have been nothing short of devastating. Despite most nuclear reactors being shut down by the early 1970's, the toxic waste from Hanford continues to affect the physical and spiritual life of Native people.

Hanford Nuclear Reservation is the largest toxic cleanup project in the World. In the 30 years following the shutting down of the last nuclear reactor at Hanford, clean up has been slow and under-funded.

In this 4-part unit, you will be collecting information about how the Hanford Nuclear Reservation has impacted Tribes’ land, resources and culture and to research from multiple perspectives the continued effects of Hanford on Northwest Tribes.

Part 1: Gather background information about the Hanford Nuclear Reservation – pages 3-7
Part 2: Research and answer guiding questions from 3 different perspectives
• Ecologist – pages 9-14
• Reporter -pages 15- 22
• Tribal Representative – pages 23- 30
Part 3: Visual summary - page 31
Part 4: One-page report on Humans and the Environment - pages 32-33
Unit Reflection – page 34

Task
The Washington State governor, in partnership with the Tribes surrounding Hanford, have asked you to gather information to explain the continued effects of Hanford on Northwest Tribes and the environment surrounding the area.
In Part One you will build on your general understanding of the Hanford Nuclear Reservation by reading information from two sources (pages 4-8). Record your knowledge by completing the **Background Knowledge Graphic Organizer** on the next page. Be sure to cite your source when adding information about what you are learning (column 1).

### Background Knowledge Graphic Organizer

Read the articles titled “Hanford History” and “Hanford Site” and complete this graphic organizer.

<table>
<thead>
<tr>
<th>What am I learning about Hanford?</th>
<th>What do I still want to know?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Resources:
Source 1: Hanford History  
U.S. Department of Energy, Hanford Site

The Hanford Site sits on 586-square-miles of shrub-steppe desert in southeastern Washington State. Beginning in 1943, the site was used to produce plutonium for the bomb that brought an end to World War II. After a short lull, production was ramped up in 1947 to meet the challenges of the “Cold War” and continued until 1987 when the last reactor ceased operation. Weapons production processes left solid and liquid wastes that posed a risk to the local environment including the Columbia River. In 1989, the U. S. Department of Energy (DOE), Environmental Protection Agency (EPA), and Washington State Department of Ecology entered into a legally binding accord, the Tri-Party Agreement (TPA), to clean up the Hanford Site.

Before the Reactors: For centuries, the Hanford area bordering the Columbia River was home to several tribes of Native Americans. Remnants, artifacts, and burial sites associated with historical Native American activity are found throughout the Site and are protected by law. The mid-1800’s brought pioneers and settlers to the mid-Columbia. The small towns of White Bluffs and Hanford sprang up to support the farms and ranches of early residents. When the War Department decided to locate portions of the Manhattan Project in this part of Washington, it also decided that work to develop atomic weapons had to be done in secret. Subsequently, in early 1943, all of the residents of White Bluffs and Hanford were told to evacuate their homes and abandon their farms, and were given just 30 days and a small amount of money to do so.

WWII Era: After the residents of White Bluffs and Hanford moved away, the War Department began the process of recruiting workers to build nuclear reactors and processing facilities required to extract plutonium for atomic weapons. People from all over the country came to Hanford, ultimately forming a 51,000 person workforce. Very few of the workers knew what they were building or what these facilities would do once they were completed. Hanford employees believed they were doing important war work, but beyond that, they knew few details. Under the careful supervision of such noted scientists as Enrico Fermi, crews began the process of building production reactors at Hanford. Workers also built two massive processing facilities called “canyons”, where plutonium would be extracted from uranium “fuel rods” after removal from the reactors. Hanford’s ultimate triumph came with the nuclear explosion above Japan in August 1945, effectively ending World War II.

Cold War Era: Post World War II tensions between the U.S. and Russia brought about the “Cold War” and drove continued atomic weapons production and Hanford’s plutonium production mission. Additional reactors were constructed next to the Columbia River as the two nations began to develop and stockpile nuclear weapons. In 1959, construction began on the last Hanford reactor, dubbed “N.” N Reactor was a dual-purpose facility which produced plutonium for atomic weapons as well as steam for generating electricity. It was the only dual-purpose reactor in the United States and was so advanced that President John F. Kennedy came to Hanford in September of 1963 for its dedication. Starting in the mid 60’s through 1971, the older reactors were shut down leaving only N Reactor operating on the Site. N Reactor continued its mission of producing plutonium and electricity
until 1987. Since that time Hanford’s mission has been to clean up the site after decades of weapons production activities.


Source 2: Hanford Site
From Wikipedia, the free encyclopedia

The Hanford Site is a decommissioned nuclear production complex operated by the United States federal government on the Columbia River in Benton County in the U.S. state of Washington. The site has been known by many names, including Hanford Project, Hanford Works, Hanford Engineer Works and Hanford Nuclear Reservation.

Established in 1943 as part of the Manhattan Project in Hanford, south-central Washington, the site was home to the B Reactor, the first full-scale plutonium production reactor in the world. Plutonium manufactured at the site was used in the first nuclear bomb, tested at the Trinity site, and in Fat Man, the bomb detonated over Nagasaki, Japan.

During the Cold War, the project expanded to include nine nuclear reactors and five large plutonium processing complexes, which produced plutonium for most of the more than 60,000 weapons built for the U.S. nuclear arsenal. Nuclear technology developed rapidly during this period, and Hanford scientists produced major technological achievements. Many early safety procedures and waste disposal practices were inadequate, and government documents have confirmed that Hanford's operations released significant amounts of radioactive materials into the air and the Columbia River.

In 1989, the State of Washington (Dept. of Ecology), US Environmental Protection Agency (EPA), and the US Department of Energy (DOE) entered into the Tri-Party Agreement which sets targets, or milestones, for cleanup. EPA and Ecology share regulatory oversight based on CERCLA (Superfund) and RCRA.

The weapons production reactors were decommissioned at the end of the Cold War, and decades of manufacturing left behind 53 million US gallons (200,000 m³) of high-level radioactive waste stored within 177 storage tanks, an additional 25 million cubic feet (710,000 m³) of solid radioactive waste, and areas of heavy Technetium-99 and uranium contaminated groundwater beneath three tank farms on the site as well as the potential for future groundwater contamination beneath currently contaminated soils. In 2011, DOE, the federal agency charged with overseeing the site, "interim stabilized" 149 single-shell tanks by pumping nearly all of the liquid waste out into 28 newer double-shell tanks. Solids, known as salt cake and sludge, remained. DOE later found water intruding into at least 14 single-shell tanks and that one of them had been leaking about 640 US gallons (2,400 l;
530 imp gal) per year into the ground since about 2010. In 2012, DOE discovered a leak also from a double-shell tank caused by construction flaws and corrosion in the bottom, and that 12 double-shell tanks have similar construction flaws. Since then, the DOE changed to monitoring single-shell tanks monthly and double-shell tanks every three years, and also changed monitoring methods. In March 2014, the DOE announced further delays in the construction of the Waste Treatment Plant, which will affect the schedule for removing waste from the tanks. Intermittent discoveries of undocumented contamination have slowed the pace and raised the cost of cleanup.

In 2007, the Hanford site represented 60% of high-level radioactive waste by volume managed by the US Department of Energy and 7–9% of all nuclear waste in the United States (the DOE manages 15% of nuclear waste in the US, with the remaining 85% being commercial spent nuclear fuel). Hanford is currently the most contaminated nuclear site in the United States and is the focus of the nation's largest environmental cleanup. Besides the cleanup project, Hanford also hosts a commercial nuclear power plant, the Columbia Generating Station, and various centers for scientific research and development, such as the Pacific Northwest National Laboratory and the LIGO Hanford Observatory.

On November 10, 2015, it was designated as part of the Manhattan Project National Historical Park alongside other sites in Oak Ridge and Los Alamos.

**Environmental concerns**

A huge volume of water from the Columbia River was required to dissipate the heat produced by Hanford's nuclear reactors. As much as 75,000 gallons per minute was diverted from the Columbia River to cool the reactor.

From 1944 to 1971, pump systems drew cooling water from the river and, after treating this water for use by the reactors, returned it to the river. Before its release into the river, the used water was held in large tanks known as retention basins for up to six hours. Longer-lived isotopes were not affected by this retention, and several terabecquerels entered the river every day. The federal government kept knowledge about these radioactive releases secret. Radiation was later measured 200 miles (320 km) downstream as far west as the Washington and Oregon coasts.

The plutonium separation process resulted in the release of radioactive isotopes into the air, which were carried by the wind throughout southeastern Washington and into parts of Idaho, Montana, Oregon, and British Columbia. Downwinders were exposed to radionuclides, particularly iodine-131, with the heaviest releases during the period from 1945 to 1951. These radionuclides entered the food chain via dairy cows grazing on contaminated fields; hazardous fallout was ingested by communities who consumed radioactive food and milk. Most of these airborne releases were a part of Hanford's routine operations, while a few of the larger releases occurred in isolated incidents. In 1949, an intentional release known as the "Green Run" released 8,000 curies of iodine-131 over two days. Another source of contaminated food came from Columbia River fish, an impact felt disproportionately by Native American communities who depended on the river for their...
customary diets. A U.S. government report released in 1992 estimated that 685,000 curies of radioactive iodine-131 had been released into the river and air from the Hanford site between 1944 and 1947.

Beginning in the 1960s, scientists with the U.S. Public Health Service published reports about radioactivity released from Hanford, and there were protests from the health departments of Oregon and Washington. In response to an article in the Spokane Spokesman Review in September 1985, the Department of Energy announced to declassify environmental records and, in February 1986, released 19,000 pages of previously unavailable historical documents about Hanford's operations. The Washington State Department of Health collaborated with the citizen-led Hanford Health Information Network (HHIN) to publicize data about the health effects of Hanford's operations. HHIN reports concluded that residents who lived downwind from Hanford or who used the Columbia River downstream were exposed to elevated doses of radiation that placed them at increased risk for various cancers and other diseases, particularly forms of Thyroid disease. A mass tort lawsuit brought by two thousand Hanford downwinders against the federal government spent many years in the court system. In 2005, two of six plaintiffs who went to trial were awarded $500,000 in damages. In October 2015, the Department of Energy resolved the final cases. They paid more than $60 million in legal fees and $7 million in damages.

Since 2003, radioactive materials are known to be leaking from Hanford into the environment: "The highest tritium concentration detected in riverbank springs during 2002 was 58,000 pCi/L (2,100 Bq/L) at the Hanford Townsite. The highest iodine-129 concentration of 0.19 pCi/L (0.007 Bq/L) was also found in a Hanford Townsite spring. The WHO guidelines for radionuclides in drinking-water limits levels of iodine-129 at 1 Bq/L, and tritium at 10,000 Bq/L. Concentrations of radionuclides including tritium, technetium-99, and iodine-129 in riverbank springs near the Hanford Townsite have generally been increasing since 1994. This is an area where a major groundwater plume from the 200 East Area intercepts the river ... Detected radionuclides include strontium-90, technetium-99, iodine-129, uranium-234, –235, and –238, and tritium. Other detected contaminants include arsenic, chromium, chloride, fluoride, nitrate, and sulfate."

In February 2013, Governor Jay Inslee announced that a tank storing radioactive waste at the site had been leaking liquids on average of 150 to 300 gallons per year. He said that though the leak posed no immediate health risk to the public, it should not be an excuse for not doing anything. On February 22, 2013, the Governor stated that "6 more tanks at Hanford site" were "leaking radioactive waste" As of 2013, there are 177 tanks at Hanford, 149 of which have a single shell. Historically single shell tanks were used for storing radioactive liquid waste and designed to last 20 years. By 2005, some liquid waste was transferred from single shell tanks to (safer) double shell tanks. A substantial amount of residue remains in the older single shell tanks with one containing an estimated 447,000 gallons (1,700 m³) of radioactive sludge, for example. It is believed that up to six of these "empty" tanks are leaking. Two tanks are reportedly leaking at a rate of 300 gallons (1,136 liters) per year each, while the remaining four tanks are leaking at a rate of 15 gallons (57 liters) per year each.

Source: https://en.wikipedia.org/wiki/Hanford_Site
Part 2: Different Perspectives
Pages 8-30

In Part Two you will be researching the Hanford Nuclear Site and gathering information from 3 different perspectives.

- Ecologist: As an ecologist, you will be explaining the biological effects of Hanford on the plants and animals surrounding Hanford Nuclear Reservation.
- Reporter: As a reporter, you will provide information on the effects of Hanford on the communities surrounding Hanford Nuclear Reservation.
- Tribal representative: As a tribal representative, you will provide a historical perspective on how the tribes surrounding Hanford Nuclear Reservation have historically interacted with the land, and how Hanford has affected this interaction.

Each of the three research parts includes text to read and a graphic organizer to record your findings.
Perspective: Ecologist – someone who studies and explains how human actions affect other living things and their environment.
You are now ready to do research as an Ecologist. You will be explaining the biological effects of Hanford on the plants and animals surrounding Hanford Nuclear Reservation. Your job is to explore the text provided in search of answers to the questions below. Record your research/evidence from the texts under the appropriate guiding question. Be sure to cite your source next to each piece of evidence.

<table>
<thead>
<tr>
<th>What plants and animals are located on or near the Hanford Nuclear Reservation?</th>
<th>How have these plants and animals been affected by exposure to the Hanford Nuclear Reservation?</th>
<th>What should be done to repair any damage done to plants or animals by Hanford Nuclear reservation?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Resources:**
1. U.S. Fish & Wildlife Hanford Reach [https://www.fws.gov/refuge/Hanford_Reach/Wildlife_Habitat/Habitat.html](https://www.fws.gov/refuge/Hanford_Reach/Wildlife_Habitat/Habitat.html) and [https://www.fws.gov/refuge/Hanford_Reach/Wildlife_Habitat/Wildlife.html](https://www.fws.gov/refuge/Hanford_Reach/Wildlife_Habitat/Wildlife.html)
Ecologist Source 1: Hanford Reach National Monument

Habitat

The Hanford Reach National Monument is, by definition, a desert, and the vegetation is hardy and drought-resistant.

Native, pre-settlement vegetation consisted primarily of shrubs, perennial bunchgrass, a variety of forbs and a living soil crust composed of lichens, moss and algae. The state of Washington has designated shrub-steppe communities as a priority habitat because of their significance to a number of wildlife species and the scarcity of this habitat type. In addition, the U.S. Department of the Interior (DOI) has identified native shrub and grassland steppe in Washington and Oregon as an endangered ecosystem.

The Monument blends a desert environment with one of the largest river complexes in the country, providing an exceptionally wide variety of habitats within a relatively small assemblage of public lands. Each of these two sharply contrasting environments—desert and river—has its own diverse wildlife populations. The Monument also offers other habitat types. The White Bluffs provide cliff surfaces. Wetlands, some natural, some not, offer water in an otherwise arid environment. Rattlesnake Mountain is tall enough to offer a lithosol environment. Microbiotic crust is one of the smallest "micro-habitats" found anywhere and is critical for the larger shrub-steppe habitat. The shrub-steppe itself is comprised of two different habitat types—the "steppe" habitat supporting those species needing grass to survive and the "shrub" component, which are the "trees" and overstory of the Monument.

Wildlife

The sagebrush is either a food source or provides nesting, resting, thermal and escape cover for a wide variety of species. Other wildlife values associated with sagebrush include the thick canopy which protects under story vegetation (forbs) that can be a valuable food source for wildlife. Riparian areas provide structure and diversity critical for nesting, resting thermal and escape cover, as well as abundant water.

Numerous wildlife species depend upon the Monument's intact ecosystems—43 species of fish, including threatened and endangered salmon and trout; 42 mammal species; 258 bird species; 4 amphibian species; 11 reptile species; and over 1,500 invertebrate species have been documented on the Monument. At some point in almost any trip across the Monument or down the river, visitors will encounter mule deer, coyotes, white pelicans, or great blue herons. In the winter, dozens of bald eagles use the Monument. The largest elk in the state of Washington live in or visit the Monument. Beaver, mink and otter, although seldom seen, are plentiful. And thousands of insect species, many found nowhere else in the world, call the Monument home.

Source: U.S. Fish & Wildlife-Hanford Reach Wild Life &Habitat
https://www.fws.gov/refuge/Hanford_Reach/Wildlife_Habitat/
Ecologist Source 2: Excerpt from the Biodiversity Studies of the Hanford Site 2002-2003

Background
The Hanford Site is recognized as a critical reservoir of biodiversity for the semi-arid interior of the Pacific Northwest. Less than 40% of the great shrub-steppe ecosystem that once dominated the Columbia Plateau of Washington, Oregon, and Idaho has escaped development to date, and much of what remains unconverted exists in a highly degraded condition. The biological importance of the Hanford Site is relatively undisturbed shrub-steppe, riverine, and riparian habitats only increase as more and more of the surrounding landscape is converted to urban or agricultural uses.

A decade ago, the U.S. Department of Energy and The Nature Conservancy of Washington cooperated in conducting an inventory of the natural biological diversity of the Hanford Site. Between 1994 and 1998, researchers surveyed the length and breadth of the site, identifying, cataloging, and mapping the plants, animals, and biological communities of this special landscape. This work culminated with the publication of the volume Biodiversity Inventory and Analysis of the Hanford Site: Final Report, 1994ñ1999 (Soll et al. 1999). The inventory documented occurrences of dozens of rare taxa, mapped critical biological resources such as plant communities, and documented concerns regarding invasive species. Although the study accomplished much of its mission and provided a great deal of valuable information, some questions remained unanswered, and new information provided by the report generated many new questions. The current work is intended to address some of these questions.

Hanford Site and the Hanford Reach National Monument
The Hanford Site lies within the Columbia Basin, the hottest, driest part of Washington state (Franklin and Dyrness 1973). Annual precipitation varies with elevation, from as little as 16 cm at the lowest elevations (ca. 400 ft./122 m) up to 35 cm along the crest of Rattlesnake Mountain (3500 ft./1067 m). Major soil types include sandy soils, which are typical of lower elevations, as well as silt loams and stony loams. Upland vegetation, where undisturbed, is dominated by Wyoming big sagebrush (Artemisia tridentata ssp. wyomingensis) and associated shrubs, perennial bunchgrasses, and forbs, especially on zonal, silt loam soils. Plant communities on sandy soils and stony loams may be characterized by bitterbrush (Purshia tridentata) and desert buckwheat (Eriogonum) species, respectively, along with associated grasses and forbs. Where disturbed, communities may be converted to annual grasslands dominated by cheatgrass (Bromus tectorum). Riparian areas are characterized by shrubs such as woods rose (Rosa woodsii), mock orange (Philadelphus lewisii), and traveler’s joy (Clematis ligusticifolia), by occasional trees such as black cottonwood (Populus trichocarpa), quaking aspen (P. tremuloides) and willows (Salix spp.), and by moisture-loving graminids and forbs.

Conclusions
Biological studies continue to confirm Hanford’s national and regional importance as a refuge for both rare and common species and communities that were once far more widespread in the inland Northwest. Biodiversity studies over the last decade have allowed us to learn much about the natural systems of the Hanford Site, and of the diverse array of native organisms that populate these systems and contribute to their natural processes. However, in many ways, our investigations have just begun
to scratch the surface of the complex biology of this arid land. Studies of aquatic and terrestrial invertebrates and of biological soil crusts continue to uncover new species; our understanding of the function of these organisms in ecosystems is in its infancy. Our knowledge of rare plant population trends is severely limited by the short time period during which we have been able to study them; a much more long-term perspective is required to provide the information necessary to adequately manage these limited resources. Plant communities may change gradually in response to long-term fluctuations in climate and rapidly in response to episodic events such as wildfires and other disturbances. Invasive species populations are dynamic and will continue to pose a challenge for natural resource managers into the foreseeable future, a challenge that will only increase with the increasing globalization of commerce. A strong commitment to ongoing monitoring programs to maintain up-to-date capabilities for assessment of the status of biological resources and the threats to those resources throughout the Hanford Site is highly recommended.

The biological inventories and associated studies conducted over the past decade have shown that every management unit of what is now the Hanford Reach National Monument, as well as Central Hanford, possesses important resources that contribute to the biodiversity of the site and the region. It is important that these biological values be given strong consideration by the U.S. Fish and Wildlife Service, the U.S. Department of Energy, and the engaged public in planning for the use and development of the Hanford Reach National Monument and the other lands of the Hanford Site.
Ecologist Source 3: “Feds find shortcuts in nuclear cleanup”  
High Country News 2002  
By Krissy Clark

The Hanford bomb factory, built in secrecy at the end of World War II, has been called the most radioactive site in the Western hemisphere. After it closed in 1989, federal and state agencies promised to clean up the 560-square-mile chunk of desert along the Columbia River - a job that would require more than 80 years and at least $50 billion. But now, one of the largest toxic-waste cleanup efforts in the world could turn into a rush job.

This spring, the Bush administration announced efforts to "accelerate" the cleanup at Hanford: According to a Department of Energy spokesman, the agency will find "innovative ways" to get the job done 40 years ahead of schedule. Then, in early October, Hanford officials laid out plans to wind down the cleanup of Hanford's most contaminated areas by 2006.

These efforts, which have their roots in an Energy Department rule issued under the Clinton administration, have made nuclear watchdogs, Native American tribes and the state of Washington skeptical. Geoff Fettus, an attorney with the Natural Resources Defense Council, says Energy Department officials are trying to "cover over a problem and leave it for the future to deal with, rather than dealing with it themselves."

What's in a name?

The key conundrum at Hanford involves 177 underground tanks, each about the size of the U.S. Capitol dome. They hold a brew of nuclear weapons byproducts and have already leaked more than 1 million gallons into the soil and the Columbia River (HCN, 9/1/97: Radioactive waste from Hanford is seeping toward the Columbia).

Federal law requires that the Energy Department remove 99 percent of the high-level waste from Hanford and bury it in a deep geologic repository, such as Nevada's Yucca Mountain. The agency already has plans to pump some of the liquid waste out of the tanks, turn it into glass logs, and ship it off site. But the tanks will still be left with a highly radioactive crust.

That, says Energy Department spokesman Eric Olds, is where the challenge lies: "Once you've removed all of the waste out of the tanks - or as much of the waste as you can - do you go back in and literally attempt to scrub it out?" Olds asks. "Or can you stabilize the residual waste, and then perhaps do some sort of cap over the top?"

This shortcut may be the route of choice, thanks to a 1999 Energy Department order which allows its officials - without any outside approval - to reclassify some "high level" waste as less strictly regulated "incidental" waste. At Hanford, as well as two other sites in Idaho and South Carolina, the agency plans to use this order to apply less stringent standards to the cleanup of some materials inside its waste tanks. According to Energy Department documents, these reclassified wastes don't warrant disposal in a geologic repository "because of their lack of long-term threats
to the environment and man."

Fettus, who is representing environmental groups and the Yakama Indian Nation in a lawsuit to block the reclassification effort, says the Energy Department is rewriting the rules so it can walk away from lethal waste in hard-to-reach places. "The department has awarded itself the authority to reclassify or rename essentially any material it can’t get out of the bottom of the tanks," he says.

**A matter of ethics**

While each side prepares its legal arguments - the case will be heard before a federal court in Idaho early next year - the dispute raises questions about whether 50 years of nuclear contamination can ever be cleaned up.

"It's pretty obvious that we cannot in any way really restore Hanford," says Greg Dash, a physics professor at the University of Washington. "The best we can do is to fence it off and consider it to be a national sacrifice area."

This doesn't sit well with those who live nearby. In the 50 years since Hanford was built, the Yakama Indian Nation has been denied the ancient hunting and fishing rights it holds on the land. To make matters worse, a recent EPA report found that the Yakama and other Northwestern tribes are 50 times more at risk for cancer than the general public (HCN, 9/16/02: Toxic fish taint tribal diet). While the cause hasn't been pinpointed, the radioactive leaks from Hanford's tanks are a prime suspect.

"We do not know just exactly how our health is affected," by living near Hanford, says Russell Jim of the Yakama Indian Nation, "whether our gene pool has been changed, whether or not the high rate of cancer that's now showing here and the mutations of some of our children (are) a result from Hanford."

But the questions surrounding Hanford's cleanup go beyond science. For some, a thorough cleanup of Energy and Defense Department wartime messes is a matter of ethics.

"They were allowed to operate in secrecy, with no accountability, spending about $5 trillion of taxpayers' money, and now we're left with the hangover," says Tom Carpenter, head of the Seattle chapter of the nonprofit watchdog group, Government Accountability Project. "The hangover is the worst contaminated sites in the world, that will remain so for literally tens of thousands, hundreds of thousands, of years."

---

**Source:** High Country News [https://www.hcn.org/issues/238/13514](https://www.hcn.org/issues/238/13514)
**Perspective: Reporter – someone who is responsible for delivering information and updates on current events to the public.**

You are now ready to do research as a **Reporter**. You will be gathering factual information to inform the public about the Hanford Nuclear Reservation. Your job is to explore the text provided in search of answers to the questions below. Record your research/evidence from the texts under the appropriate guiding question. Be sure to cite your source next to each piece of evidence.

<table>
<thead>
<tr>
<th>What communities surround the Hanford Nuclear Reservation?</th>
<th>What have been the negative impacts of the Hanford Nuclear Reservation on surrounding communities?</th>
<th>What should be done to communities surrounding Hanford Nuclear Reservations?</th>
</tr>
</thead>
</table>

**Resources:**

The Hanford Nuclear Site occupies about 560 square miles in southeastern Washington State, adjacent to the towns of Pasco, Kennewick and Richland. The facility was the world’s first large-scale nuclear production plant. It was constructed in the early 1940s as part of the Manhattan Project to produce plutonium for nuclear weapons. Over the course of many years, large amounts of radioactive materials (radionuclides) were released into the atmosphere and the Columbia River as part of the plutonium production process. The major radioactive releases occurred in the form of gases and particles into the air from 1944 through 1957. These releases occurred mainly because of increased production and lack of filter systems. Changes in the production process over the years greatly reduced releases into the air. Many different kinds of radioactive materials were released. For many people living in the region, most of their dose was due to iodine-131 released into the air.

### Exposures to Radiation

Iodine-131 was carried by winds to surrounding areas and deposited on vegetation. It was then absorbed in the milk of cows and goats that grazed on the contaminated vegetation. Drinking contaminated milk caused most of the radiation dose for most of the exposed people. People were also exposed by eating contaminated fruits and vegetables, and by breathing contaminated air.
Findings

The HTDS data show that the risks of thyroid disease were about the same regardless of the radiation doses people received. In other words, no associations between Hanford’s iodine-131 and thyroid disease were observed.

The findings do not prove that Hanford radiation had no effect on the health of the area population. However, the findings show that if there is an increased risk of thyroid disease from exposure to Hanford’s iodine-131, it is probably too small to observe using the best epidemiologic methods available.

Researchers studied all types of thyroid disease, as well as a disease of the parathyroid glands called hyperparathyroidism, and abnormalities of the thyroid gland that can be seen only on ultrasound examinations.

In each case, the results were the same. The percentages of people with each kind of thyroid disease or with ultrasound abnormalities were about the same regardless of their estimated radiation dose from Hanford’s iodine-131. There were no statistically significant dose-responses for any of the diseases or ultrasound abnormalities studied.

Thyroid disease was found in the study population. This was expected because thyroid disease is common in other populations, especially among older people and women.

Researchers found that the rates of thyroid disease in the HTDS population were generally consistent with the rates of disease detected in other populations.

Source: Centers for Disease Control and Prevention
https://www.cdc.gov/nceh/radiation/hanford/htdsweb/guide/history.htm
Reporter Source 2: The Hanford Nuclear Site
Hanford Challenge

Less than three hours east of Seattle, WA is the most contaminated site in the United States--The Hanford Nuclear Reservation. Hanford stores 56 million gallons of radioactive waste in old, leaky underground tanks just a few miles from the Columbia River. There is a plan to clean up this 56 million gallons of waste. But after more than 20 years, none of the worst waste has been cleaned up. Cleaning up Hanford is a huge undertaking. Cleaning up Hanford costs $2.4 billion dollars a year and requires technologies and engineering solutions never used before. And it must be done safely. Because, a really bad day at Hanford, could be a really bad day for a 3-state area.

Hanford Background Information
Hanford is located in Southeastern Washington state and is 586 square miles, or almost half the size of Walla Walla County. Today, the Department of Energy, a federal agency, owns the Hanford Site. And although it owns the site and controls major cleanup decisions and priorities, the DOE doesn’t actually do any cleanup. Instead, it hires private contractors—like Bechtel, AECOM, and CH2MHill—to do all of the actual cleanup.

Along the river, there are nine old nuclear reactors, most of which have been cocooned. Cocooned basically means that they put a building over the core of the reactor, which is hot from radioactive materials, and let the radioactivity inside naturally decay to a more manageable level before workers enter to finish cleaning them up. The Central Plateau, located in the center of the site, is where the tank farms and the worst of the waste is located. The Central Plateau is also where the Waste Treatment Plant is located. This plant is designed to turn the liquid waste in the tanks into a solid glass (a process called vitrification), which will then be buried in a deep geological repository. This plant has been in the news a lot because of the high costs, missed deadlines, and design flaws. For example, the plant was originally supposed to cost a little over $4 billion dollars and start making glass in 2008, but the latest estimate for treating dangerous waste is 2036 and will cost more than $16.8 billion dollars.

Brief Hanford History
Hanford was originally part of the larger Manhattan Project to produce the world’s first nuclear weapons. Thousands of people showed up from all across the nation to work on a top secret project. Many of them had no idea what they were all working towards for many years. Secrecy was a top priority. Hanford’s main role in the Manhattan Project was to produce the plutonium for US nuclear weapons. The plutonium produced at Hanford was used in the first nuclear bomb tested at the Trinity Site in New Mexico and used in “Fat Man”, the bomb dropped on Nagasaki, Japan on August 9, 1945.

Plutonium production at Hanford created a lot of waste. Hanford produced plutonium so fast that they started ‘disposing’ of hazardous wastes through a variety of means. This included discharges directly into the air, directly into the Columbia River, directly into unlined trenches, and for many years, waste was poured directly into the soil—a total of 450 billion gallons of nuclear and chemical waste. That’s the equivalent of more than 680,000 Olympic size swimming
pools. However, Hanford did eventually build 177 tanks to hold the most dangerous waste at Hanford.

**Hanford’s Dangerous Wastes**
The tanks at Hanford currently store 56 million gallons of high-level waste. And over 1 million gallons has leaked into the soil. Most of the tanks are single-shell steel tanks, which were built between 1943 and 1964. The tanks were built to last 40 years, so the tanks are now well passed their design life. Each Hanford tank is the size of a four-story apartment building. Yet the waste inside these tanks is harmful in microscopic quantities.

More than 1800 chemicals have been identified in the tank waste. Of these, about 1,500 are present in the headspace of the tanks, which is the space between the top of the waste and the roof of the tank. These chemicals in the headspace must be vented to prevent an explosion in the tanks. Plutonium-239, which is found in the tanks and other locations onsite, has a half-life of 24,100 years. And it takes 10 half-lives before it is considered to cease its radioactivity. This waste will be dangerous for hundreds of thousands of years. Hanford continued to produce plutonium throughout WWII and up until the end of the Cold War. All in all, Hanford made 74 tons of plutonium, which is 2/3 of the United States total stockpile.

**Transition To Cleanup**
The Department of Energy signed a cleanup agreement with the Environmental Protection Agency and the State of Washington on May 15, 1989, called The Tri-Party Agreement. The goal of the Tri-Party Agreement is to reach compliance with federal environmental laws. Under the Tri-Party Agreement, the cleanup was expected to take 30 years. However, Hanford is not going to be cleaned up next year, but instead cleanup is expected to take another 75 years.

Currently, there are approximately 9,000 people working on Hanford cleanup and even though cleanup has been slow, there has been a lot of progress. Workers have moved 7.5 million gallons of waste from the oldest and most leaky tanks to newer and more robust double shell tanks. Keeping more waste from reaching the soil and groundwater. And workers have treated over 18 billion gallons of contaminated groundwater, keeping more contamination from reaching the Columbia River. With all of the negativity around Hanford cleanup, it is really important to recognize that the workers have done a lot of great work and that there has been a lot of progress.

**Hanford Challenge**
As more and more concerns about the cleanup arose and some workers were even being fired after publicly raising safety concerns, a nonprofit, Hanford Challenge, was created to advocate for workers at the site in 2007. Hanford Challenge focuses on building relationships with workers and listening to their concerns. We get a lot of our information from insiders doing the actual cleanup—engineers, health physics technicians, construction workers, inspectors, and government officials. Our hope is that by protecting every workers’ ability to raise concerns, it will create a robust safety culture that will make the cleanup safer for workers, the public, and the environment.

Source: [http://www.hanfordchallenge.org/](http://www.hanfordchallenge.org/)
The largest plutonium production project in the world occurred at the Hanford Nuclear Reservation, a 560-square mile manufacturing plant located in southeastern Washington. In an effort to beat the Germans (and later the Russians), federal government contractors, staffed with the brightest minds of the day, produced incredible amounts of plutonium with breathtaking speed.

Over half of the plutonium used to build the United States arsenal of nuclear weapons, including the plutonium used to build the bomb dropped on Nagasaki, came from Hanford.

**Hanford's past: plutonium production**

Most Hanford workers, farmers and others who lived near Hanford from the 1940's through 1960's speak proudly of their community and the vital role they played in America's defense. And rightly so. They are proud of being the "Atomic City," and when Richland obtained its independence from General Electric, one of the federal contractors at Hanford, the town fathers included a mock atomic explosion as part of the celebration. Even the Richland High football team's emblem is the mushroom cloud.

What no one knew was that the contractors were knowingly exposing them to radiation.

**The Green Run**

Activities at Hanford resulted in the release of large amounts of radiation into the air, water and soil of the Northwest over several decades. Many of the radiation releases have exceeded permissible limits. Some of the radiation releases have admittedly been intentional, a way of conducting Cold War nuclear experiments on an unknowing and captive population. All of it was done in the name of the national security and the rush to produce more and more plutonium.

The largest intentional release of radiation at Hanford occurred in 1949 and is known as the "Green Run." The public was unaware of this event until some 40 years later, in the late 1980's, when the DOE first declassified release reports acknowledging that the Green Run had occurred and then only after a newspaper reporter sued the agency.

Documents showed that Hanford intentionally and secretly released about 8,000 curies of radioactive iodine on Dec. 2, 1949. Allegedly the radiation was released to monitor the radioactive plume stretching across Oregon and Washington in hopes of evaluating equipment used in determining the location of similar Soviet plutonium production plants.

The Green Run was a huge release by any standard. The 1979 Three Mile Island accident released between 15 and 24 curies of radioactive iodine, several hundred times less than the Green Run, and nearby residents were evacuated from the area.

No one living downwind from Hanford was ever evacuated or warned of the Green Run or any of the other radioactive release from Hanford. Spanning more than 40 years, a set of 400 environmental
documents were made public in 1986. These documents revealed that Hanford regularly emitted radiation into the environment. Between 1944 and 1947 the total estimated radioactive iodine released from Hanford was at least 685,000 curies; a truly staggering amount.

Despite this fact, contractors working for the federal government at Hanford repeatedly informed the public that Hanford was safe. When the public asked if Hanford was safe, they were told that "not one atom" had ever escaped from Hanford and that Hanford was as "safe as mother's milk."

Who are the Hanford Downwinders?

Today, citizens of Washington, Oregon and Idaho are outraged that the federal government secretly irradiated them and lied about it. Many are worried about their health, and for good reason. By 1940 standards (much more lax than those of today), the Green Run alone exposed those living near Hanford to amounts of radiation 20 times above tolerance thresholds. Those who lived downwind of Hanford in the years of the releases have subsequently reported widespread incidents of serious diseases often associated with radiation exposure, including cancer and thyroid disease.

Although former Secretary of Energy Admiral James D. Watkins admitted that Hanford had released enough radioactive iodine to cause harm to those living around it, the federal government took no action to correct the wrong done to the U.S. citizens downwind of Hanford, the so-called Downwinders.

In light of the fact that the government did not intend to rectify this public wrong without additional pressure, several Downwinders stepped forward in August of 1990 and filed suit in federal court seeking recovery for the injuries they suffered as a result of the releases of radiation from Hanford.

This suit later became known as In re Hanford Nuclear Reservation Litigation, and today it has two offspring, In re Hanford and In re Berg. The cases are independent of one another, yet involve injuries caused by radiation exposure from Hanford.

Radiation health effects

Radiation exposure can cause serious health effects, even death. Humans are exposed to radiation in a variety of ways including through air, water and the food chain. According to a formerly classified 1954 technical report, the federal contractors at Hanford discharged at least 8,000 curies of radioactive material per day into the Columbia River.

Such radioactive discharges exposed people who ate fish and waterfowl, swam or boated on the river, irrigated their fields with water from the Columbia or simply drank its water. Radioactive discharges from Hanford also reached humans through consumption of foods or plants or the consumption of milk or meat from animals that grazed on contaminated plants or hay.
Children, the largest consumers of milk, are more susceptible to the harmful effects of radiation than adults. One of the more horrifying ways in which numerous Downwinders were exposed to Hanford's radioactive materials was through their mother's milk. Like other living organisms, humans who consume contaminated plants or animals, drink radioactive milk or water, inhale radiative material or are otherwise exposed to radiation, also secrete harmful radionuclides into their milk and pass it along to suckling babies in a more concentrated form.

As it turns out, Hanford was as safe as mother's milk; but the milk itself was hazardous to the child it was meant to nurture.

Hanford's disregard for human health and the welfare of the community around it is shocking. From the immoral and shameful actions of the government contractors silently exposing Americans to radiation to the sloth-like pace of the litigation where tax dollars are used to defend the contractors' actions, the overall picture is mind-boggling.

Taken together, it is positively unprecedented. What the government and its contractors did in the name of national security was to declare war on the American public -- the Downwinders.

...Human health continues to deteriorate, diseases go undetected, and our precious resources continue to be wasted as long as the government continues to deny its responsibility. Our government leaders should be better examples than that and the Downwinders and our natural environment deserve better. It is time that this undeclared war on the American public come to an end -- that the victims of the war be made whole and that the healing begin.

Source: The Seattle Daly Journal of Commerce, Environmental Outlook
http://www.djc.com/special/enviro98/10043971.htm
**Perspective: Tribal Representative – someone who is appointed by a Tribal leader to discuss issues or concerns.**

You are now ready to do research as a **Tribal Representative**. As a Tribal representative, you will provide a historical perspective on how the tribes surrounding Hanford Nuclear Reservation have historically interacted with the land, and how Hanford has affected this interaction. Your job is to explore the text provided in search of answers to the questions below. Record your research/evidence from the texts under the appropriate guiding question. Be sure to cite your source next to each piece of evidence.

<table>
<thead>
<tr>
<th>Question</th>
<th>Resource</th>
</tr>
</thead>
<tbody>
<tr>
<td>How have Northwest Indians relationship with the land, plants, and animals changed, since the establishment of the Hanford Nuclear Reservation?</td>
<td></td>
</tr>
<tr>
<td>What should be done to repair damage done by Hanford to Northwest Indian communities physical and spiritual lives?</td>
<td></td>
</tr>
</tbody>
</table>
Tribal Representative Source 1: excerpt from “Tribes cast for tradition, catch controversy”
High Country News 1999
By Rocky Barker

A complicated history
The tribes have fished the Columbia for hundreds of generations, but their right to fish in modern times was secured by the treaty of 1855, when the tribes ceded most of Oregon, Washington and Idaho to the United States. They retained the right to fish in the "usual and accustomed places."

As the number of fish declined from millions to thousands, the competition for Columbia salmon and steelhead increased. In the mid-1970s, the tribes won court cases that gave them the right to take 50 percent of all the fish caught in Washington and Oregon. Indian and non-Indian fishermen clashed violently at times along the banks of the river, fighting over a steadily declining number of fish.

The violence ended by the early 1980s, but the emotions have not diminished. In fact, the listing of four runs of Snake River salmon and steelhead in the 1990s has intensified the conflict recently, as Indian and non-Indian fishermen fish side-by-side under different rules. This year, Hoptowit says she brushed off the occasional rude comments from customers. But camping at the isolated landing, often with only her elderly uncle Willard Kaninie, she faced more intimidating acts.

"We had a car down here, spinning around, calling us names belligerently," she says.

Many farmers, grain shippers and other river users share the view that the gantlet of hooks, nets and lures that salmon must run from Alaska to Idaho is a major cause of the salmon's decline.

Most of the fish Hoptowit and the other tribal fishers catch are Columbia River fall chinook that spawn in the Hanford Reach near Richland, Wash. This population of salmon is healthy, with several hundred thousand adults expected to return to spawn this year.

But at the same time, anywhere from 1,000 to 1,500 endangered fall chinook that spawn in the Snake River and thousands more endangered steelhead are in the river. Gill nets are not selective; inevitably, tribal fishermen take some of these fish.

Most scientists say that fishing has had little effect on the 30-year decline of Snake River salmon runs. They note that fishermen catch less than 10 percent of the Snake River's annual run of wild spring/summer chinook.

"In the 1950s and '60s, half of the spring/summer chinook were taken by fishermen in the Columbia River, yet Idahoans could still catch fish and have enough left over to sustain the species," said Ed Bowles, Idaho Department of Fish and Game anadromous fisheries manager.
But others say it makes no sense to let Indians catch endangered fish. The more than $400 million spent annually to save endangered Snake River salmon and steelhead overwhelms the estimated $1 million tribal fishermen will make, says Bruce Lovelin, director of the Columbia River Alliance, a Portland-based coalition of industries and commercial interests. The alliance wants to pay the tribal fishermen as much as $5 million a year to keep them from fishing, thus allowing more endangered salmon and steelhead to return to Idaho. "Paying $2 a pound for these fish is ridiculous," Lovelin says.

**Taste the tradition**

Tribal leaders are attempting to change the image of the gill-netting season and to increase the income for the 300 tribal members who annually participate. Until three years ago, the only outlet was the commercial fish market, which bought the fish for as little as 60 cents a pound. For the past three years, the tribes have conducted a marketing campaign to promote salmon sales along the banks of the river.

"Taste the tradition," the radio commercial says.

"It's definitely brought us more buyers," Hoptowit says of the marketing campaign.

But tribal fishermen say fishing has always meant far more than money. It's the essence of their culture, and for some, it's religion.

Troy Walker, a Nez Perce tribal member from Kooskia, Idaho, lay on a sleeping bag in the middle of a disheveled campsite overlooking the Columbia just below John Day Dam. With his friends, Robert McCormick of Lapwai, Idaho, and Percy Jack of Washington, he watched a hoop net hanging from a wooden scaffold built over the water.

"When it dances, we pull up the fish," Walker explains.

These fish are not for sale. They are for personal and ceremonial use, and these fishermen can fish all year. Jack, a member of the Seven Drum religion, explains that the fish are a sacred part of its traditional ceremonies.

"First there is the water, then the salmon in the water, then the deer, the roots, the berries and the water again," he says. "From the river to the mountain with water afterwards, to cleanse."

Fishing from scaffolds with hoop and dip nets was the primary fishing method for tribal fishermen before dams inundated the rapids that were the best fishing sites. The largest and most important was Celilo Falls, covered by the backwaters of The Dalles Dam in 1957.

Hoptowit says the loss of Celilo Falls was a tragedy of enormous proportions for her father. She remembers seeing Celilo as a toddler. Though she never had a chance to fish there, Hoptowit carries on the tradition upriver, beneath the black lava bluffs surrounded by sagebrush steppe where her mother, a Walla Walla tribal member, had registered her fishing sites.
She hopes to pass them down to her daughters, Evelyn Galloway and Goette Galloway Willis, and her five grandchildren who live with her in Pocatello.

"It's a part of my life," she says. "It's something we've always done."

Source: High Country News Article – Fishing
https://www.hcn.org/issues/169/5454?searchterm=Hanford%2C+India

Tribal Representative Source 2: Excerpt from Yakama Indian Nation

The Confederated Tribes and Bands of the Yakama Nation are descendants of 14 tribes and bands that were federally recognized under the Yakama Treaty of 1855. The 1,377,034-acre reservation is located in southcentral Washington, along the eastern slopes of the Cascade Mountain Range.

The current spelling of "Yakama" was reintroduced in 1994 by the tribe to return to the original spelling.

A brief history
The Yakama were one of several Native American groups who lived in similar ways on the Columbia Plateau of today's Idaho, Oregon and Washington. Their economy was based on fishing, hunting, gathering, and intertribal trading of such items as fish products, baskets, dogs and horses.

The Yakama Nation today
More than 8,800 people are enrolled in the Yakama confederation of tribes, and there are more than 13,700 people living on or close by the reservation.

All tribal members over 18 years of age are automatically voting members of a general council, the basic governmental unit of the tribe. In addition, representatives of each of the confederated 14 tribes and bands comprise the Yakama Tribal Council, the body that carries out the will of the general council. Directly reporting to the tribal council are standing committees that deal with cultural resources, education, farming, grazing, health, housing, irrigation, recreation, roads, timber, and wildlife management.

The tribe operates a fisheries program with about 40 employees. One of its projects is its collaboration with the U.S. Department of Energy to use discontinued (radiation-free) settling ponds at the Hanford Nuclear Reservation to condition about 500,000 juvenile Chinook salmon for release into the Columbia River.

The Yakama Indian Nation also co-manages the Columbia and eight other rivers with the state of Washington. The tribe has "usual and accustomed" fishing places in numerous locations in the
Columbia River Basin, as well as some beyond the area. Salmon continue to be an important nutritional and symbolic commodity of the Yakama Nation.

To serve Yakama families, the Indian Health Service operates the 40,000-square foot Yakama Nation Tribal Health Facility near Toppenish. In addition, the tribe owns and operates the White Swan Health Clinic in rural White Swan, 20 miles west of Toppenish, and a maternal child health (MCH) center in the Apas Goudy Housing Project in Wapato. Itinerant health and social services are offered through the Community Health Representative, MCH, nutrition, Women, Infants and Children, and alcoholism programs. The tribe's health service delivery area covers four counties.

The tribe manages 1,118,149 acres, which include 600,000 acres of timber. There also are 15,000 acres of cultivated land. In addition, the tribe irrigates 90,000 acres from the Wapato Project and leases farming and grazing acreage to non-Indians. The confederation maintains its own police force and tribal court.

The Yakama people place an accent on academic achievement. They award scholarships to exceptional students and sponsor Camp Chaparral, whose activities encourage students both to stay in school and preserve their traditional identity. In addition, the public schools and some adult education classes offer the Yakama dialect of Sahaptin.

The Yakamas actively preserve numerous elements of their heritage. A focal point is the all-purpose Cultural Heritage Center, which hosts numerous tribal projects to uphold traditional arts & crafts, history, language, literature and other topics. Powwows, celebrations and sporting events are an integral part of modern Yakama life throughout the year.

Given that the confederation consists of 14 tribes and bands, it is not surprising that the Yakama people worship in various ways -- both native and Christian. Some partake of salmon, roots, and berries in sacred First Food rituals. Three longhouses on the reservation serve as traditional places of worship, while others participate in the Feather religion. Other Yakamas attend Christian services; an example is the Indian Shaker Church.

Source: Yakama Indian Nation  http://www.ohwy.com/wa/y/yakama.htm
Tribal Representative Source 3: Hanford Natural Resource Trustee Council
Guiding Principles for Protection of Natural Resources

Introduction
The Hanford Site is important for natural resources. It features a large contiguous shrub-steppe ecosystem, critical chinook salmon spawning habitat in the longest free-flowing stretch of the Columbia River above Bonneville Dam, as well as landscapes and sites with unique and irreplaceable historic, tribal, cultural, and scientific heritage. Hanford is considered a critical reservoir of biodiversity in the Pacific Northwest. The site is home to thirty-eight species of birds and fifteen species of small mammals considered Species of Conservation Concern. More than 1500 species of terrestrial insects have been found, including several found nowhere else in the world. Twenty-eight rare plant taxa on Hanford are listed as endangered, threatened, or sensitive.

As cleanup nears completion on large areas of Hanford, attention is focusing again on future uses of the site, including protection of Hanford’s special ecological and cultural heritage. Within this setting and context, the Hanford Natural Resource Trustees will play a crucial role in restoring natural resources that may have been injured as a result of hazardous substances released from the Hanford facility.

The Hanford Natural Resource Trustee Council
The Hanford Natural Resource Trustee Council (HNRTC) includes two state governments (Oregon and Washington), Three tribal governments (the Nez Perce Tribe, the Confederated Tribes of the Umatilla Indian Reservation, and the Yakama National), and three departments of the federal government (U.S. Department of Energy, U.S. Department of Commerce (NOAA), and the U.S. Department of the Interior (Fish and Wildlife Service)). The HNRTC organized under a Memorandum of Agreement (MOA in 1993 to provide technical review of cleanup plans and results, but is now primarily focused on conducting a formal natural resource injury assessment, one of the steps defined by the Natural Resource Damage Assessment and Restoration (NRDA) provisions of CERCLA and associated regulations. Under the Comprehensive Environmental Response, Compensation, and Liability act (CERCLA), natural resource trustees are assigned a non-discretionary responsibility to protect the public interest-to make the public whole- for injuries to natural resources and the services they provide, caused directly or indirectly by releases of hazardous substances. Accordingly, Hanford trustees have both the responsivity and the authority to implement restoration that ensures the long-term ecological integrity of the Hanford site. The assessment are under consideration by the Trustee Council includes all of the Hanford site, and offsite areas where Hanford hazardous substances were released or have come to be located, such as lands impacted by aerial releases of hazardous materials and portions of the Columbia River. Under CERCLA, trustees are charged with identifying, quantifying, and gaining compensation for injuries to natural resources and the services they provide, through restoration, replacement of habitat, or acquisition of the equivalent resources, including restoration for interim services losses.
Examples of services losses might be the inability to use groundwater (e.g., for consumption or irrigation), the loss of a subsistence or recreational fishery because of contamination, or establishment of an institutional control to protect human health, thereby limiting access to the resource. Under NRDA, injury is measured in relation to the “baseline” condition of the site or resource or service, or the condition that would have existed “but for” the release of hazardous substances. Restoration is often required to return resources and services to baseline conditions.

**Principles and Trustee expectations for protection of Hanford natural resources**

As the NRTC looks at plans for closure and some of the proposed long-term uses of the site, we have significant concerns. Broadly stated, trustees want a good cleanup of Hanford:

- We believe that cleanup must be to levels that will end existing injury to natural resources and the services they provide and avoid future injury.
- We urge DOE to avoid decision or actions that might constrain future site restoration or be incompatible with restoration principles, and to consult with trustees if such decisions are under consideration.
- We urge DOE to avoid further disturbance and/or loss of natural resources, habitats, or services. We also discourage any disturbance that results in fragmentation of habitats on and/or adjacent to the Hanford site.

Although DOE has authority for land management decisions for those parts of the site not currently placed in the Hanford Reach National Monument, a June 2000 presidential memo directed DOE to permanently manage central Hanford to protect valued habitats and areas of scientific and historic interest similar to those of the Hanford Reach National Monument. The HNRTC stands ready to support DOE in fulfilling that mission. Hanford trustees are currently drafting a Hanford Facility Restoration Plan as part of the NRDA process. The draft plan articulates a number of procedural and ecological goals and values for restoration. The NRTC believes that restoration must:

- Fully make the public whole for natural resources injured as the result of releases of hazardous substances or as part of the response actions;
  - Protect, restore, and/or re-establish native species and the habitats needed to support them;
  - Repair habitat fragmentation; protect or restore habitat corridors and connectivity between habitats on and off-site;
  - Protect, restore, and manage sustainable habitats and landscapes to support multiple ecological niches, ecosystem services, and native species;
  - Include early restoration where feasible and appropriate to reduce interim service losses to resources and to accelerate site recovery;
- Comply with federal, state, and tribal treaties, laws, and policies;
- Fulfill the needs and interests of trust governments and their constituents, in terms of restoration of ecosystem services such as unrestricted use of the land, preservation,
education, recreation, traditional cultural uses and health and well-being expectations (e.g., solitude, clean air, water);

- Provide opportunities for the public to participate in the restoration planning process;
- Provide for sufficient monitoring and maintenance to ensure and to document successful long-term restoration of resources.

1 http://www.hanford.gov/?page=651&
2 Injury is defined as a measurable adverse change in the resource that is not remedied by cleanup activities.

Source: Nez Perce Tribe Treaty of 1855, Natural Resources
Now that you’ve researched the Hanford Nuclear Reservation and its effects on the environment and people, complete the graphic organizer below. Use your notes to create a visual (pictures, symbols, lines, arrows, etc…) to represent key ideas.

<table>
<thead>
<tr>
<th>Background Knowledge</th>
<th>Ecologist</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reporter</th>
<th>Tribal Representative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Part 4: Humans and the Environment Report
Pages 32-35

Because we all depend on the health of the environment, responsible citizens need to understand how humans affect and are affected by the environment. You have researched the Hanford Nuclear Reservation and studied how people living in the same area have affected and been affected by the environment.

Your Task

In a one pager, you will:

➢ State a claim about peoples’ use of the environment.

➢ Provide background on your claim.

➢ Provide reasons and evidence to support your claim. Derive your reasons from your analysis of one or more significant similarities or differences related to the groups’ uses of the environment.

➢ Cite your sources when you draw information from them.

Complete this report and the final unit reflection.
Guiding Question: Based on your research, how have humans effected and been affected by their environment?

Claim:

Reason and Evidence to support my claim

Reason and Evidence to support my claim

Reason and Evidence to support my claim

Credible Sources Used:
<table>
<thead>
<tr>
<th>Unit Reflection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Why should I care about this issue?</td>
</tr>
<tr>
<td>How does my understanding of this issue change my thinking about my own community?</td>
</tr>
</tbody>
</table>
Unit 2: The Constitution and Government of Washington State

In this 4-part unit, students will be gaining a deep understanding of the purpose of government in general, the structure and processes of Washington’s state government, and the rights and responsibilities of citizenship.

Part 1: The Purpose of Government – pages 36-37
Unit Reflection: page 46
Part 1: The Purpose of Government

Guiding Question: What is government and why does it exist?

To get you thinking about government systems, consider these three questions about rules at school or at home.

1. What is the rule?
2. What do you think the purpose of the rule is from the perspective of the rule-maker?
3. Do you generally follow this rule? Explain why or why not.

Add your ideas on the chart below.

<table>
<thead>
<tr>
<th>What is the rule? Describe and explain the rule you are thinking about. Who made the rule and why? How long has this rule been in effect?</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the purpose of the rule? What are the consequences for not following the rule?</td>
</tr>
<tr>
<td>Explain your perspective of the rule. Do you generally follow this rule? Why or why not?</td>
</tr>
</tbody>
</table>

Lesson Simulation – Lost on an Island

Pretend you were on a ship with 400 other people that washed up on the shore of a deserted island in the middle of the Pacific Ocean. It doesn’t look like you will be rescued any time soon and you have limited food and shelter. Consider the information below.

- Food: There is an area of the island with foul tasting yet edible plants but hoarding and gluttony could diminish the supply over time. Supplies from the ship’s resources include: 100 packages of peanuts, 200 packets of salt and pepper, 10 gourmet candy bars, and 100 cans of various sodas. The island has a fresh water source, but it might contain bacteria. At the top of a high cliff is a single lonely, but fairly productive coconut tree.
- Shelter: The ship is on the beach but listing to the side which makes it difficult to use. Other than trees, there is no other shelter available.
- Medical supplies: There are five first aid kits onboard.
- Human resources: There is one doctor, two nurses, a teacher, a firefighter, and a paramedic among the survivors. 100 of the people marooned are under 18 and 300 of the people are over 18.
Based on this scenario, it seems important to establish some rules. You’ve been asked to form a committee to attempt that task. List your rules below with a brief explanation.

<table>
<thead>
<tr>
<th>Name of Rule</th>
<th>Brief Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Consider each of the questions and add your ideas and thoughts.

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>What might happen if there were no agreed upon rules on your island?</td>
<td>Who and how will the rules be enforced?</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Would the group that created the rules be considered a government?</td>
<td>How are the rules you made similar or different than laws?</td>
</tr>
<tr>
<td>Explain why it is or is not a government.</td>
<td></td>
</tr>
</tbody>
</table>
Part 2: The Structure of the Government of Washington

Guiding Question: How did Washington become a state and establish a system of government?

Read this excerpt from The State We’re In: Washington, your guide to state, tribal & local government produced by the League of Women Voters of Washington Education Fund.

Creating Washington’s government

Starting in the 1840s, settlers from the East and Midwest began to come to the Oregon Territory in search of land to farm, adventure, and the opportunity to create new communities. At first, just a few came, but after 1846, when Britain gave up its claim to this area and the Oregon Territory became an official part of the U.S., the number of settlers multiplied every year. Most of them settled in the Willamette Valley, and they established Salem as their capital.

But some came to what is now western Washington, and by 1851, they were campaigning to make the land north and west of the Columbia River a separate territory. From the new settlements in Seattle and Olympia, it took at least three days to get to Salem, and people didn’t feel the Salem government really represented them. So the settlers in what is now Washington called meetings, published newspaper articles, and asked Congress to declare the area north and west of the Columbia River a separate territory. In 1853, their wish was granted, even though there were only about one thousand settlers north of the Columbia. Congress also made the territory much larger than they had asked by adding land to the east of the Columbia River.

In 1854, U.S. President Franklin Pierce sent Isaac Stevens to be the governor of Washington Territory. Territories were controlled by the federal government, so the governor worked for the President of the United States.

The President wanted Isaac Stevens to negotiate treaties with all the Indians who lived in the Washington Territory. The purpose of the treaties was to persuade the Indians to give up most of their lands, so that more white settlers could come and live here, and so that the federal government could grant them clear ownership of the land. From 1854-1856, Isaac Stevens traveled all over the state, and persuaded tribes to sign treaties in which the Indians promised to live on reservations, which were specific pieces of land reserved for them. In many cases, this meant the tribes had to relocate; that is, they had to move from where they usually lived. The tribes were promised small payments for the land they gave up, and they were promised that they could continue to fish, hunt, and gather in their “usual and accustomed places.” They were also promised government services such as health care and education.

The white people who wrote the treaties thought that Indians should settle down, learn how to farm, and live like white people. This didn’t make much sense to the Indians, who had been fishing, hunting, and moving around freely for thousands of years.

Isaac Stevens and the people who worked for him didn’t know very much about the Indians and their way of life, and they didn’t take the time to learn, because they were in a hurry to get treaties signed and get all the Indians grouped together on reservations.

There were brief wars between some of the Indians and the federal government over the terms of the treaties. The federal government won.
Within the next few decades, Washington began to fill up with settlers. These settlers wanted Washington to become a state, because then they could form their own state government instead of having a governor appointed by the President.

**Writing Washington’s constitution**

In 1889, 75 men were elected to go to Olympia to write a state constitution. For Washington to become a state, a constitution had to be written and voters had to approve it.

State constitutions are similar to the U.S. Constitution, but not exactly the same. Like our national Constitution, state constitutions set up the basic organization of government and spell out the rights of citizens. They are the foundation on which government is built. But state constitutions are usually more specific and have more detail. For instance, our state constitution describes certain services that state government must provide — schools, prisons, and state institutions to care for people who have certain disabilities. The federal Constitution doesn’t say anything about what services our national government must provide.

State constitutions can also differ from our national constitution in the rights they give to citizens. For instance, Washington’s constitution has stronger protections of people’s privacy, our right to own guns, and stricter separation between religion and government.

Among the people (called delegates) who wrote our constitution there were 22 lawyers, 19 farmers or ranchers, nine storeowners or bankers, six doctors, three teachers, and three miners. There were no women in the group because women didn’t have the right to vote, except in elections for local school boards. There were also no Indians. At that time, Indians were considered citizens of Indian nations, not citizens of the United States. There were also many Chinese immigrants in Washington, most of whom came here to work in the mines and help build the railroads, but they weren’t allowed to become citizens, so they weren’t represented either.

Starting on the 4th of July, 1889, the 75 men set to work. They didn’t start from scratch. They copied parts of the constitutions of other states, and some sections from an earlier draft of a Washington state constitution that had been written in 1878.
Think back to Part 1 when you created rules for your island. Complete the Venn Diagram below comparing the two systems of government.

Using the information from the Venn Diagram, identify the three most important characteristics in an effective government. Explain your reasoning for each characteristic.

<table>
<thead>
<tr>
<th>Important Characteristic</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Part 3: The Legislative Process of Washington

Guiding Question: *How are laws made?*

When you turn 18, you will have the right to vote in state and federal elections. What is important for you to consider when voting? How will you make informed decisions?

It is important to understand the different types of government systems. Study the types of government explained in the graphic below.

Who Makes the Rules?
Where would you place the following? Is it possible for some to be in two or more categories?

<table>
<thead>
<tr>
<th>Getting a Driver’s License</th>
<th>Guidelines for using a park</th>
<th>Declare war</th>
<th>Build roads and bridges</th>
<th>Collect taxes</th>
<th>Oversee Education</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>National Government</th>
<th>State Government</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Local Government</th>
<th>Tribal Government</th>
</tr>
</thead>
</table>

41
Analyze the chart showing how an idea become a law.

<table>
<thead>
<tr>
<th>What was surprising?</th>
<th>What did you already know?</th>
<th>What questions do you have?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

42
Part 4: What is Suffrage?

Guiding Question: Why were some people denied the right to vote?

by Gwen Perkins, edited by Abby Rhinehart

"Suffrage" means the right to vote. When citizens have the right to vote for or against laws and leaders, that government is called a "democracy." Voting is one of the most important principles of government in a democracy.

Many Americans think voting is an automatic right, something that all citizens over the age of 18 are guaranteed. But this has not always been the case. When the United States was founded, only white male property owners could vote. It has taken centuries for citizens to achieve the rights that they enjoy today.

Who has been able to vote in United States history? How have voting rights changed over time? Read more to discover some key events.

1789: Religious Freedom

When the nation was first founded, several of the 13 colonies did not allow Jews, Quakers, and/or Catholics to vote or run for political office. Article VI of the Constitution was written and adopted in 1789, granting religious freedom. This allowed white male property owners of all religions to vote and run for political office.

1870: Men of All Races Get the Right to Vote

At the end of the Civil War, the United States created another amendment that gave former male slaves the right to vote. The 15th Amendment granted all men in the United States the right to vote regardless of "race, color, or previous condition of servitude."

This sounded good, but there was a catch. To vote in many states, people were still required to own land. This prevented many former slaves and poor people from being able to cast a ballot. Some states also had what was known as a "poll tax," meaning people had to pay money to vote. People created ways to stop African Americans from voting, including literacy tests, threats of physical violence, and hiding poll locations. Many states passed what became known as "Black Codes," which made some of these intimidation tactics legal.

1920: Women Get the Right to Vote

The 1848 Seneca Falls Convention was the first big event in American women’s fight for suffrage. At that Convention, a group of three hundred men and women united to discuss equal rights for women and men. Many conference attendees believed in equal rights for all citizens, regardless of race or gender. Women began to campaign for the right to vote.

There were many black suffragists. But not all women wanted to include African American women in the parades and marches. They worried that racist legislators would deny women the right to vote if they included African American women.
Many states passed women’s suffrage, including Washington state in 1910. But people still fought for a nationwide law for women’s suffrage. When the 19th Amendment passed in 1920, all white and black women got the right to vote. In the next decade, several Southern states passed laws to stop most African American women from voting. The 19th Amendment also did not cover other groups of women, such as Native Americans and immigrants. These women were not considered citizens.

1924: Native Americans Become Citizens

It wasn’t until 1924 that all Native Americans who had been born in the United States got citizenship. But even after 1924, many Native Americans could not vote because of state laws that restricted them. Finally, in 1948, all Native Americans got the right to vote in local and federal elections.

1964: Poll Tax Removed

The 24th Amendment prevented poll taxes, which had required people to pay to vote. This removed a major barrier to voting for many people.

1965: The Voting Rights Act

African American voters received protection from the harsh Black Codes when the Voting Rights Act was passed in 1965. This act guaranteed the voting rights that people had been officially given in 1870. It also prevented states from discriminating against minority voters. This helped many minorities -- not only African Americans but Latinx Americans, Asian Americans, and others.

Suffrage - Only a Beginning?

Getting the right to vote doesn’t guarantee equality for all. What suffrage does is give citizens a voice. It allows citizens to make laws and elect people to represent them in government. For groups that have fought for suffrage, getting the vote has not been the end of struggle. Instead, it was just the first stage in getting political and social equality, a struggle that continues today.

Source: Washington State History Museum Suffrage Curriculum, 2019
The historic journey to give all citizens the right to vote has been challenging. Choose two of the groups represented in the text and summarize the challenges and successes they faced.

<table>
<thead>
<tr>
<th>Group Name</th>
<th>Challenges</th>
<th>Successes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>