The Radioactive Dirt

An Analysis of the Role Information has Played Throughout Hanford's History

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This paper will explore how information played an important role in the history of the Hanford site. Looking closely at Environmental Protection Agency (EPA), Department of Energy (DOE), and other government agency publications and documents will bring more insight into the effects on the environment and how the government has handled the situation throughout its operations. This paper will also add non-governmental perspectives on the issues presenting news reports and evidence that call attention to the problems.

East of Mount Rainer National park, past the dry but green vineyards of Yakama, over the low slung sandy beige hills in a flat stretch of land near a bend in the Columbia River lies the Hanford site. At this moment, buried beneath its arid, dusty earth is over 750,000 cubic meters of stored toxic waste.[1] Since 1944 the Hanford site has pumped 75,000 gallons of water a minute from the Columbia River to cool its 200 tons of uranium in its three reactors.[2] The groundwater eighty square miles around the site is contaminated with radioactive or chemical substances above the drinking water standards.[3] Since operation, the site has caused major environmental hazards affecting both the natural environment and individuals surrounding the site.[4]

History and Background

The genesis of the Hanford site starts with the Manhattan Project. After the Japanese attack on Pearl Harbor in 1941 the U.S. government decided to carry out a full-scale program to build an atomic bomb. The Army Corps of Engineers set up the Manhattan Engineer District as described in a U.S. Department of Energy document as operating like a "large construction company on a massive scale."[5] With the investment of hundreds of millions of dollars, the project rapidly expanded, scattering research laboratories and facilities across the nation.

In 1943 the War Department decided to use portions of land near the towns of White Bluffs and Hanford in eastern Washington. These small towns sprang up in the 1850s to support the farms and ranchers in the area. The War Department informed the residents of these towns to evacuate their homes and abandon their farms and gave the residents just thirty days and a small amount of money in aid.[6]

Once the residents were pushed out of the area the War Department recruited workers for the construction of reactors and laboratories for the processing of plutonium. The work at the site was compartmentalized, meaning very few workers knew exactly what the laboratories and facilities were producing at the time they were working.

This compartmentalization of the departments inside Hanford was a calculated way by the government to limit information. The reasons are twofold. The first reason was to restrict military secrets from getting out. Even if the worker shared information with spies, that worker only knows a small part of the complex project. The second reason this limiting of information worked in the government's favor was that it masked the intent of the project at Hanford to its workers.

The construction crews built a total of three reactors and "two massive processing facilities called 'canyons,' where plutonium would be extracted from uranium fuel rods after removal from the reactors."[7] All the scientific, technical, and labor behind the Manhattan Project came to a head with the detonation of a nuclear bomb dubbed "Fat Man" which was dropped on Nagasaki, and partly assisted in ending the Second World War in 1945.

The end of the Second World War did not however bring an end to operations at the Hanford site. With atomic weaponry and energy came both the Cold War and the idea of America's Atomic Age in late 1940's. President Harry S. Truman addressed Congress on October 3, 1945 touting the limitless possibilities of atomic energy when he said, "The discovery of the means of releasing atomic energy began a new era in the history of civilization."[8] In this same address, President Truman highlighted the utopian vision that the utilization of

atomic power meant to America at the time by remarking, "it may someday prove to be more revolutionary in the development to human society than the invention of the wheel, the use of metals, or the steam or internal combustion engine."[9] However, with the promise of this new, powerful energy came the quick move by the U.S. government to control every part of it.

Truman's address plays with information in an interesting way. By presenting to the public an image of atomic energy as an invention as safe as the wheel, metal, or steam, he downplays the intent and extreme dangers associated with harnessing the new energy. During the same day that President Truman was addressing Congress, a bill, H.R. 4280, was making its way through the House. This bill sought to create a policy that would allow "control of all sources of this energy be vested in the commission established by this Act and that all activities connected with research on the transmutation of atomic species, the production of nuclear fission, and the release of atomic energy shall be conducted in the interest of the Nation and world peace, under the supervision and direction of the commission."[10] This commission would eventually be called the Atomic Energy Commission when the Atomic Energy Act was signed into law the next year in 1946.

On August 1, 1946, President Truman signed into law the Atomic Energy Act (AEC). This solidified how atomic energy was to be regulated in the United States. Looking closely at the act, one can see the intent was to restrict any public or commercial use of atomic power and keep all production and ownership by the U.S. government. Evidence of this can be seen in section 4 of the Declaration of Policy that reads, "A program for Government control of the production, ownership, and use of fissionable material to assure the common defense and security and to insure the broadest possible exploitation of the fields," along with "the United States shall be the exclusive owner of all facilities for the production of fissionable material."[11]

The reason to keep the processes and facilities in control of the government was to keep them secret. During the Cold War Hanford increased its production of plutonium and in 1959 construction began on the "N" reactor which was to be Hanford's last reactor.[12]

It was behind this cloak of government control and restriction of information, put in place by the Atomic Energy Act that allowed for many of the problems to arise at the Hanford site. This secrecy was not to last much longer. In 1986 managers at Hanford released declassified documents that revealed for first time the extent of Hanford's radioactive contamination of eastern Washington in the 1940s and 1950s.[13] In 1994, 270,000 additional pages of declassified documents originating from the Richland Operations Office became available.[14] Included in this release were reports such as, HW-72819 from February 26, 1962, which was a cost versus benefit analysis of developing an artificial lake to hold contaminated wastewater.[15] Its conclusion was that creating a holding lake was a more costly option than directly releasing the contaminated wastewater into the Columbia River.[16]

From the site's inception two million curies of radioactivity and between 90,000 and 270,000 metric tons of chemicals have been deposited in the soil and groundwater beneath Hanford.[17] The information further illustrates how these problems compounded, it reads, "Some liquids evaporated, leaving surface residues for plant and animal uptake as well as being dispersed by the wind."[18]

Impact on Surrounding Communities

These previously classified reports corroborated what Hanford workers had long suspected. Throughout Hanford's operation and weapons development radioactive materials were released in the air. Workers at the site believe they were exposed to toxic materials and lied to about the safety on site. The release of this information confirmed that radioactive releases were not just confined to the workers on site but extended to the surrounding communities.

The people that lived in the areas downwind from Hanford or who used the Columbia River south of Hanford were exposed to radiation.[19] With increasing public pressure to know more about radioactive exposure in the area, the Hanford Environmental Dose Reconstruction Project (HEDR) was conducted. The objective, to quote the report directly, was to "estimate the radioactive doses that individuals and populations could have received from nuclear operations at Hanford since 1944."[20] The finding of this report concluded that the largest part of their total dose came from drinking milk and eating food that was contaminated with radioactive materials in the immediate area and downwind from Hanford. For Native Americans in the area, they most likely came in contact with radiation through eating contaminated fish. Between 1944 and 1972, according to HEDR's estimates, about 2 million people were exposed either through the air or the Columbia River.

It may seem hard to give the government the benefit of the doubt in regard to keeping secret information on the release of radiation into the land and communities. It seems that the government's focus at the time was to keep the brisk pace to successfully harness atomic energy for a weapon to end the largest war in history, not to take the sufficient time to understand the precautions that were needed to be put in place to protect people and the planet.

Clean up

By the mid 1960s through the early 1970s reactors began to be shut down. In 1988, the last operating reactor, N, ceased operation. Once Hanford's reactors were shut down, the main task at the site became its clean up. This clean up began with the signing of the Hanford Federal Facility Agreement and Consent Order, also called the Tri-Party Agreement. The purpose of the agreement as defined in Article II is to "ensure that the environmental impacts associated with past and present activities at the Hanford Site are thoroughly investigated and appropriate response action taken as necessary to protect the public health, welfare and the environment."[21] The agreement goes on to lay out both a Legal Agreement and an Action Plan.[22] The Legal Agreement lays out the terms, obligations, and authority of the three parties. The Action Plan outlines the cleanup duties, timelines, and procedures the agencies will follow.

Much of the Tri-Party Agreement also had to conform to two other related acts and policies noted in its introduction. The first of these two acts was the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Enacted in 1980, this law aimed to "provide for liability, compensation, cleanup, and emergency response for hazardous substances released into the environment and the cleanup of inactive hazardous waste disposal sites."[23] CERCLA also sets up, in section 221, the "Hazardous Response Trust Fund" more popularly known as the Superfund.[24] These federal funds were available for response to threats or "releases of hazardous substances into the environment only for purposes of . . . claims for injury to, or destruction or loss of, natural resources, and response costs."[25] The second of these laws that the Tri-Party Agreement had to follow was the Resource Conservation and Recovery Act (RCRA). This act sets up financial and technical assistance for the management for the safe disposal of discarded hazardous waste materials.[26]

The Hanford site includes four separate superfund sites which include the 100, 200, 300, and 1100 Areas (see figure 1).[27] An official five-year report on the progress of the DOE's performance and actions on the site illustrate the different area's contaminations. Area 100's ground water is contaminated with strontium-90, Area 200 needs contaminated soil removed, the "remedial action objectives" to treat the uranium plume in Area 300 was not achieved, however the dichlorodiphenyl trichloroethane (DDT) contamination in Area 1100 has been removed and remains secure.[28]

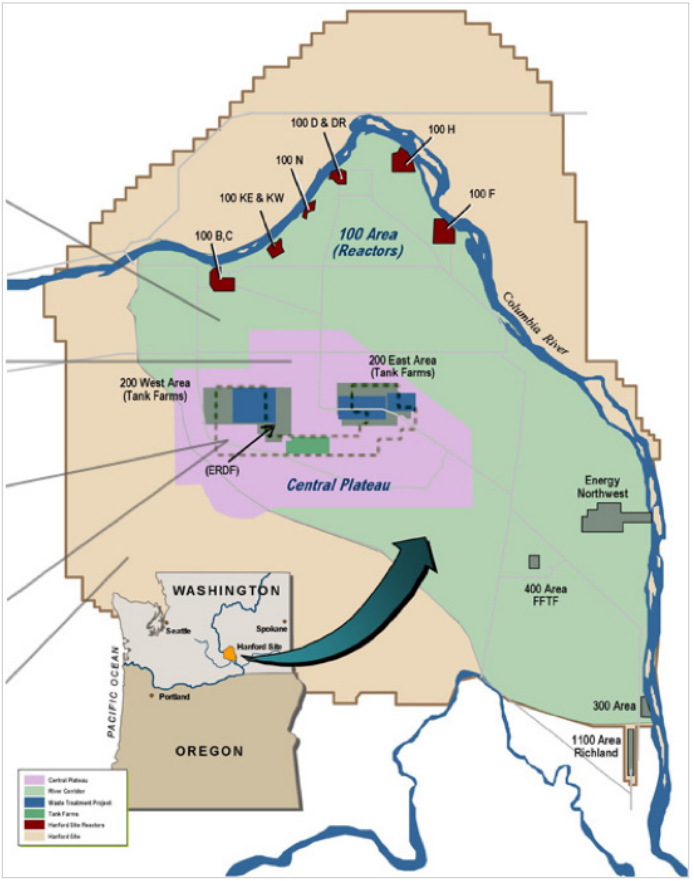

Figure 1. Map of Hanford site. U.S. Department of Energy, Hanford Information Related to the American Recovery and Reinvestment Act of 2009, https://www.hanford.gov/page.cfm/Recovery.

Public Involvement and Mounting Problems

The Tri-Party Agreement's article XLII contains the details for the implementation of a "Community Relations Plan, now known as the Public Involvement Plan (PIP) which responds to the need for an interactive relationship with all interested community elements, both on and off Hanford, regarding activities and elements of work undertaken by DOE under this Agreement."[29] Out of this public relations plan grew the Hanford Future Site Uses Working Group.

This Group was made up of individuals from The Confederated Tribes of the Umatilla Indian Reservation, The Yakima Indian Nation, the Nez Perce Tribe, farmers of the region, local city officials, environmental groups, labor councils, and others. The driving force behind this group was to include the public in discussion together about the future of the site and to shape how clean up will proceed over the decades to ensure that "beneficial future uses of the site will indeed become a reality."[30]

The Working Group met nine times through 1992 and came up with future use options for the site and to determine appropriate clean up scenarios to make their decisions possible.[31] The Working Group ended and released their final report

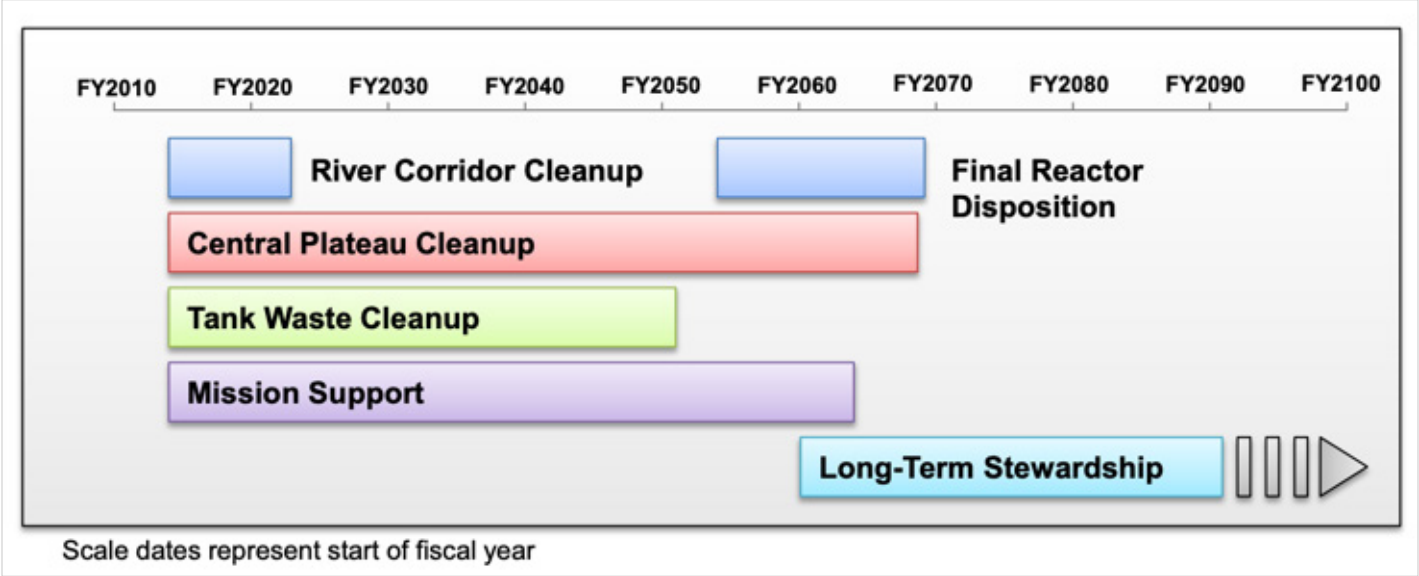

Figure 2. Hansford clean-up timeline. U.S. Department of Energy, "2014 Hanford Lifecycle Scope, Schedule and Cost Report," https://www.hanford.gov /files.cfm/2014_Fact_Sheet_final_021814.pdf.

in 1992. This report highlighted four major recommended options and the appropriate environmental improvement plans for each of the future use options. These included an arid land ecology reserve, Native American use, wildlife and recreation use, and a museum and visitor center.

As time pressed on, clean up goals were missed; the work group renegotiated hundreds of individual changes since its original adoption.[32] The plan to immobilize the tank wastes by pressurizing it into vitrified (glass) form was expected to begin by 1999 and all the tanks to be emptied and closed by 2018.[33] Only one area, the 1100 area, has been deemed clean enough to be removed from the 1989 Superfund clean-up list.[34]

Progress since 2000

Hanford has been called "the most toxic place in America" and cleanup is expected to go on for decades to come.[35] As of 2018, delays and problems still plague the site. In 2017 the DOE had to activate emergency operations when a twenty-foot-long tunnel that was used to store ageing contaminated radioactive materials collapsed.[36] The timeline for a recent clean-up schedule, seen in figure 2, reveals clean up stretching to 2070.

As cleanup continues so does the battle for official information concerning the site. On May 14, 2018, the DOE released a highly criticized order altering the way it interacts with the Defense Nuclear Facilities Safety Board.[37] The board was created by Congress to make recommendations to the energy secretary on safety issues at Hanford and elsewhere. The *Tri-County Herald* reported that "the board, along with nuclear facility watchdog groups across the nation and the Energy Communities Alliance, have raised concerns that the order appears to reduce the board's access to nuclear facilities and information."[38] The struggle to keep important information accessible to those who need it and can benefit from it persists. The U.S. government has and will continue to restrict and regulate information. However, the more individuals know about methods and techniques for requesting and connecting to relevant information, the better off we are at holding the government.

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