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Hanford Nuclear Site: Remediating to a Standard Safe for All or Some?

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Cover Page Footnote

Dylane graduated cum laude from Seattle University School of Law and was the Marketing and Events Editor of the Seattle Journal of Environmental Law. Dylane would like to thank her family who supported her during her law school career. Without their love and support, she would not have made it through the long days and nights of studying and editing.

Hanford Nuclear Site: Remediating to a Standard Safe for All or Some?

Dylane Jacobs[†]

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INTRODUCTION

Nuclear Warfare has not always been the way of the world; World War II, followed by the Cold War, introduced the use of nuclear weaponry and changed how the world fought wars.¹ In 1943, as part of the Manhattan Project, the U.S. established the Hanford Nuclear Site in Washington State to house the B Reactor for their Nuclear Weaponry program.² Over the years, a total of nine reactors were constructed along the Columbia River to facilitate the production of plutonium for nuclear warfare.³ In 1989, however, production stopped and efforts were shifted towards the cleanup of the hazardous substances for the duration of the project.⁴

The Hanford cleanup is one of the largest cleanups undertaken in the U.S. and is governed by many Federal and State environmental statutes including: Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), Resource Conservation and Recovery Act (RCRA), Hazardous Waste Management Act (HWMA) and Model Toxics Control Act (MTCA).⁵ Although the cleanup is governed by CERCLA, one of the most comprehensive environmental statutes enacted, the statute originally was missing a cultural impact assessment for the cleanup standards.⁶ The Superfund Amendments and Reauthorization Act (SARA) updated certain aspects of CERCLA.⁷ SARA required that the tribal governments be accorded the same status as a state, with respect to certain parts of CERCLA, and that Native American exposure scenarios be considered when assessing remediation scenarios.⁸

Presidential Executive Order 13084 states that there should be “meaningful [and effective] consultation and collaboration with Indian tribal governments in the development of regulatory practices on Federal

¹ *The Cold War*, ATOMICCENTRAL <http://www.atomcentral.com/the-cold-war.aspx> (last visited Nov. 12, 2016).

² *B Reactor Tours*, MANHATTAN PROJECT NATIONAL HISTORICAL PARK <http://manhattanprojectbreactor.hanford.gov/> (last updated Jan. 28, 2015).

³ *Region 10: The Pacific Northwest, Hanford, Washington*, U.S. EPA, <http://yosemite.epa.gov/r10/cleanup.nsf/sites/Hanford> (last updated Nov. 2, 2016).

⁴ *Id.*

⁵ Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §§ 9601-9675 (2006); Resource Conservation and Recovery Act, 42 U.S.C. §§6901-6992k (1972); WASH. REV. CODE §70.105; WASH. REV. CODE §70.105D.

⁶ See generally Mervyn L. Tano, *Superfund in Indian Country: The Role of the Federal-Indian Trust Relationship in Prioritizing Cleanup*, International Institute for Indigenous Resource Management (March 1998), available at <http://www.iiirm.org/publications/Articles%20Reports%20Papers/Environmental%20Restoration/superfund.pdf> (showing that CERCLA originally was missing a cultural impact assessment that was later added in).

⁷ *What is SARA Title III?*, MSDSONLINE, <https://www.msdsolnline.com/resources/regulatory-information/sara-reporting.aspx> (last visited Nov. 12, 2016).

⁸ Tano, *supra* note 6 at 1.

matters that significantly or uniquely affect their communities.”⁹ Therefore, the agencies in charge of Hanford, U.S. Department of Energy (USDOE) and the Washington Department of Ecology (Ecology), are required to collaborate with the Native American Tribes of the area.¹⁰ However, “[c]onsultation does not mean informing the tribe what EPA decides or trying to argue the tribe out of its research exposure factors.”¹¹

At the same time, the agreement between USDOE, Ecology, and the EPA about the cleanup efforts has been contiguously litigated over missed deadlines and cleanup goals.¹² As such, six single-shell tanks have begun to leak radioactive material into the groundwater connected to the Columbia River due to the drawn-out nature of the cleanup efforts.¹³

USDOE needs to be held accountable for the future impacts these harms will have on certain Native American Tribes. Hanford needs to (1) mandate the use of the Native American exposure scenarios; (2) hold USDOE and the EPA to deadlines at the site; and (3) build new double shell tanks to stop the leaking of waste to prevent further exposure.

Part I of this Article discusses the history of CERCLA and the SARA amendments. It details the relevant language pertaining to the standards of how Superfund sites should be cleaned and the later amendments that lay out the specific levels needed.¹⁴ Part II of this article documents the Hanford Nuclear Site case study. It describes the long history of Hanford, the U.S. government’s original goals for the site, and the subsequent cleanup efforts. Additionally, it discusses the history of the Native Americans and their interaction with Hanford. Further, it lays out how CERCLA and SARA have failed in requiring USDOE to clean up Hanford to a level acceptable for the Native Americans. Part III proposes how the USDOE can act to be more effective at remedying the injustices and cleanup of Hanford to the level needed for the historical use of the land. The proposal is three pronged: usage cultural exposure standards, accountability for TPA deadlines, and new methodology for preventing further releases.

⁹ Exec. Order No. 13084, 63 Fed. Reg. 96, 27655 (May 14, 1998).

¹⁰ K. V. Clarke, 2.0.1 The Role of Indian Tribes, ANNUAL ENVIRONMENTAL REPORT, at 2.1 <http://hanford-site.pnnl.gov/envreport/2004/15222/15222-2.pdf> (last visited Nov. 12, 2016).

¹¹ Shannon Cram, *Becoming Jane: The Making and Unmaking of Hanford’s Nuclear Body*, 33 ENVIRONMENT AND PLANNING D: SOCIETY AND SPACE 796, 806 (Oct. 2015).

¹² Patrick Marshall, *Governor Booth Gardner announces the Tri-Party Agreement to clean up toxic waste at the Hanford Reservation on February 27, 1989*, HISTORYLINK.ORG (Jan. 12, 2014), <http://www.historylink.org/File/10707>.

¹³ *Id.*

¹⁴ Superfund site is a determination of hazardous nature based on CERCLA. See *infra* Part IA for description.

I. HISTORY OF HAZARDOUS WASTE LEGISLATION

In the 1960s, environmental activism was on the rise, which led to the enactment of the Clean Air Act of 1963, the Water Quality Act of 1965, the Endangered Species Act of 1965, the Clean Water Act of 1972, and many other environmental statutes.¹⁵ The political climate was ripe for legislation pertaining to the cleanup of dangerous contaminants plaguing cities such as Love Canal in the Niagara Falls area of New York.¹⁶ The Resource Conservation and Response Act of 1976 (RCRA) was the first legislation enacted to respond to this issue of hazardous contaminants.¹⁷ Although the government was convinced that RCRA solved the “last remaining loophole” in environmental law, RCRA failed to consider all the problems that could potentially arise from the introduction of hazardous material in the environment and how to clean up the waste.¹⁸ Thus, the enactment of CERCLA, and later SARA, were needed to fill in those gaps.¹⁹

A. What is CERCLA?

In 1980, CERCLA was created to clean up all hazardous waste sites, whether the sites were controlled, uncontrolled, or abandoned by their owners.²⁰ CERCLA was directed specifically towards any type of release of pollutants or contaminants into the environment.²¹ CERCLA was enacted after the government discovered, during the Love Canal disaster, that RCRA was not as comprehensive as it had hoped.²² Although the RCRA was designed as a solid and hazardous waste management statute at facilities where the owners or operators were known, operating, transporting, or disposing of hazardous material, RCRA failed to take into account any hazardous sites that were abandoned or non-operative.²³ The purpose of CERCLA was to identify sites where hazardous materials threatened the environment and public health as a result of “leakage,

¹⁵ *Timeline: The Modern Environmental Movement*, PBS, <http://www.pbs.org/wgbh/americanexperience/features/timeline/earthdays/> (last visited Nov. 12, 2016).

¹⁶ Robert V. Percival, Christopher H. Schroeder, Alan S. Miller, & James P. Leape, *Environmental Regulation: Law, Science and Policy*, 351 (7th ed. 2013).

¹⁷ *Id.* at 411.

¹⁸ *Id.*

¹⁹ *Summary of the Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)*, U.S. EPA, <http://www2.epa.gov/laws-regulations/summary-comprehensive-environmental-response-compensation-and-liability-act> (last updated Feb. 8, 2016) [hereinafter Summary of the CERCLA].

²⁰ *Id.*

²¹ *Id.*

²² Percival, Schroeder, Miller, & Leape, *supra* note 16, at 411.

²³ Gerry Kirkpatrick, *What's the Difference Between a Superfund and RCRA Cleanup?*, ENVIRONMENTAL STANDARDS (Dec. 1, 2014), <http://www.envstd.com/whats-the-difference-between-a-superfund-and-rcra-cleanup/>.

spillage, or general mismanagement” and then clean up the site to a usable standard.²⁴

Congress had two goals in mind when it enacted CERCLA: prevention of the contamination of the environment and the cleanup of hazardous waste spill sites.²⁵ To achieve these end goals, CERCLA created a tax on the chemical and petroleum industries.²⁶ CERCLA further provided broad authority for the EPA to respond directly to potential or actual releases of hazardous substances that could theoretically threaten public health or the health of the environment.²⁷ Over the first five years, \$1.6 billion was collected and placed in a trust fund, called the Superfund, for the government to use in cleaning up abandoned or uncontrolled hazardous waste sites.²⁸ CERCLA retains the nickname “Superfund” because of this trust fund.²⁹

CERCLA dictates that sites are examined for their hazardous nature. If they are found to be hazardous, the remediation sites are placed on the National Priority List (NPL) under CERCLA §§104, 105 and undertake actions to “promptly [] abate, prevent, minimize, stabilize, mitigate or ideally eliminate the threat.”³⁰ This means the site must be cleaned up to a level that prevents a further threat to the environment and the people of the surrounding area.

Furthermore, CERCLA gives the EPA the power to find the “potentially responsible part[y]” (PRP) for a release and hold USDOE accountable for the remedial efforts under strict liability, even if they have abandoned the site.³¹ The PRP is responsible for the abatement of “actual or potential releases of hazardous substances in order to prevent imminent and substantial endangerment.”³²

CERCLA authorizes two kinds of remediation actions: short-term removals and long-term remedial response actions. Short-term removals are “where actions may be taken to address releases or threatened releases requiring prompt response.”³³ Long-term remedial response actions are those “that permanently and significantly reduce the dangers associated with releases or threats of releases of hazardous substances

²⁴ Jessica Hope, *What is CERCLA - and why is it important,?*, HAZARDOUS WASTE EXPERTS (Dec. 23, 2013), <http://www.hazardouswasteexperts.com/what-is-cercla-and-why-is-it-important-2/>.

²⁵ Percival, Schroeder, Miller, & Leape, *supra* note 16, at 413.

²⁶ *Superfund: CERCLA Overview*, U.S. EPA, <https://www.epa.gov/superfund/superfund-cercla-overview> (last updated Aug. 22, 2016).

²⁷ *Id.*

²⁸ *Id.*

²⁹ *Id.*

³⁰ Hope, *supra* note 24.

³¹ Summary of the CERCLA, *supra* note 19.

³² Percival, Schroeder, Miller, & Leape *supra* note 16, at 412.

³³ *Superfund: CERCLA Overview*, *supra* note 26.

that are serious, but not immediately life threatening.”³⁴ Once the site has been picked, the EPA orders the PRP to clean up in one of the two ways.

The EPA looks at an exposure assessment to decide what standard of cleanup to use. The exposure assessment was the process by which any exposed population or potentially exposed population were identified, while the pathway of exposure, the exposure conditions, and the chemical doses were identified and quantified.³⁵

After the site has been identified as a superfund site and the remediation action is decided, the PRP is required to clean up the site set forth in 42 U.S.C. § 9621 (d)(1), which states that PRPs have to attain a level of cleanup of all the “substances, pollutants, and contaminants” that at a minimum assures protection of human health and the environment.”³⁶ The statute dictates a certain level of clean up that protects human health and the environment, but does not give specific numbers of how the site should be cleaned up. Instead, the cleanup must be “relevant” and “appropriate” under the circumstances of each individual site.³⁷ Thus, it depends on “substance, pollutant, and contaminant.”³⁸

Under 42 U.S.C. §9621(d)(2)(A)(ii), CERCLA is the overarching binding authority for hazardous waste cleanup. However, it does consider other statutes when assessing cleanup standards.³⁹ Furthermore, 42 U.S.C. §9621(d)(2)(A)(i) connects CERCLA to the other environmental statutes to add to the comprehensive nature of CERCLA cleanup requirements.⁴⁰ At the same time, CERCLA allows states that have more stringent state laws to follow the state law rather than CERCLA standards, but at a bare minimum, CERCLA standards must be met.⁴¹

CERCLA also created the Agency for Toxic Substances and Disease Registry (ATSDR) in the Public Health Service to carry out the health-related authorities in the act.⁴² ATSDR’s mission is to keep a registry of people exposed to the substances, inventory of information pertaining to the health effects of the substances, medical care and testing, and conduct surveys and screenings about the relationship between illness and the substance.⁴³ Despite including other environmental statutes,

³⁴ *Id.*

³⁵ Percival, Schroeder, Miller, & Leape *supra* note 16, at 412.

³⁶ *Id.*

³⁷ *Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Federal Facilities*, U.S. EPA,

<https://www.epa.gov/enforcement/comprehensive-environmental-response-compensation-and-liability-act-cercla-and-federal> (last updated on May 17, 2016).

³⁸ 42 U.S.C. §9621(d)(1).

³⁹ 42 U.S.C. §9621(d)(2)(A)(ii).

⁴⁰ *Id.*

⁴¹ *Id.*

⁴² *Superfund Amendments and Reauthorization Act, United States*, THE ENCYCLOPEDIA OF EARTH, <http://editors.eol.org/eoearth/wiki/Superfund> (last updated Oct. 9, 2016).

⁴³ *Id.*

CERCLA did not contain any specific cleanup standards.⁴⁴ Recognizing a missing element and a need for more money, CERCLA was amended in 1986.⁴⁵

B. What is SARA?

On October 17, 1986, SARA amended CERCLA and reauthorized CERCLA to continue cleanup activities around the country.⁴⁶ SARA reflected the EPA's experience in administering the complex Superfund program during its first six years.⁴⁷ SARA increased the Superfund trust fund by \$8.5 billion and reinforced the importance of human health, community involvement, cooperation with state and local laws and authorities, and permanent solutions to hazardous-waste cleanup.⁴⁸

Prior to SARA, CERCLA simply provided that the EPA was to select appropriate remedial actions to the extent practicable under the National Contingency Plan (NCP), including a consideration of the most cost-effective responses that would protect the public health and welfare and the health of the environment.⁴⁹ SARA added specific standards that should be met for selecting and reviewing a remedy, the degree of cleanup, and the application of state standards.⁵⁰ It further sets out a guideline for selecting a remedy such as, what actions are necessary to implement cleanup, compliance with the NCP, and the cost effectiveness of the plan.⁵¹

SARA's standards changed the way CERCLA cleanups were enforced and completed. At a minimum, the EPA has to look at the Safe Water Drinking Act, the hazardous substances released, adverse health effects of human exposure, maintenance costs, future remedial action costs, and the threat to human health and the environment.⁵² Furthermore, there were periodic check-ins on the cleanup site.⁵³ The SARA amendments further set out specific concentration levels for how a site should cleanup.⁵⁴ Additionally, SARA required the ATSDR and the EPA to prepare a list of at least 275 hazardous chemicals for each of the haz-

⁴⁴ Carole S. Switzer & Lynn A. Bulan, *CERCLA: Comprehensive Environmental Response, Compensation and Liability Act (Superfund)* 19 (2002).

⁴⁵ *Id.* at 19-20.

⁴⁶ Summary of the CERCLA, *supra* note 19.

⁴⁷ *Id.*

⁴⁸ *Geography & Environment Conservation & Management: Superfund Amendments and Reauthorization Act (SARA)*, NEW GEORGIA ENCYCLOPEDIA, <http://www.georgiaencyclopedia.org/articles/geography-environment/superfund-amendments-and-reauthorization-act-sara> (last updated Aug. 20, 2013).

⁴⁹ Swather & Bulan, *supra* note 44, at 19.

⁵⁰ *Id.*

⁵¹ *Id.*

⁵² *Id.*

⁵³ *Id.* at 20.

⁵⁴ *Id.*

ardous substances most commonly found at NPL sites, and those became the Priority List of Hazardous Substances.⁵⁵ ATSDR was to prepare toxicological profiles of the substances at a rate of at least 25 per year. Where there was insufficient information on a substance, ATSDR was also required to conduct research on the contaminants.⁵⁶

Moreover, SARA required the EPA to revise the Hazard Ranking System (HRS) to make sure that the ranking system adequately assessed the risk to human and environmental health from hazardous substances on a NPL site.⁵⁷ The HRS is “the principal mechanism the EPA uses to evaluate uncontrolled waste sites for possible inclusion on the [NPL].”⁵⁸ The HRS is a system by which information found during investigations of the potential NPL site determines the threat both to the environment and to the humans who live near and work on the site.⁵⁹ Each potential NPL site is given a score that ranges from 0 to 100 and if the potential site receives a score of 28.50 or higher the site is then eligible to be an NPL.⁶⁰ “Chronic non-carcinogenic, carcinogenic, and acute effects” were added to the considerations for the assessment and scoring because they have previously left off the consideration list.⁶¹ In addition, “the food chain threat was added to surface water pathways.”⁶² This new assessment added a holistic and characteristic look at the severity of the sites.

Furthermore, SARA added a cultural aspect to the participation and cleanup of the NPL sites.⁶³ SARA amended Section 126 of CERCLA to require “the governing body of [Native American] tribes to be accorded the same treatment as a state with respect to certain provisions of CERCLA.”⁶⁴ The definition of “state” was expanded to include Native American Tribes.⁶⁵ SARA (with Executive Order No. 13084⁶⁶) requires Native American Tribes to be treated the same as a state; however, the EPA “could now” negotiate with the tribes, as the EPA is not

⁵⁵ Agency for Toxic Substances and Disease Registry Division of Toxicology and Environmental Medicine, *Support Document to The 2013 Priority List of Hazardous Substances That Will Be The Subject Of Toxicological Profiles*, ATSDR 1 (April 2014), available at http://www.atsdr.cdc.gov/spl/resources/ATSDR_2013_SPL_Support_Document.pdf.

⁵⁶ *Superfund Amendments and Reauthorization Act, United States*, *supra* note 42.

⁵⁷ Summary of the CERCLA, *supra* note 20.

⁵⁸ *Pollution Locator: The Hazard Ranking System*, GOODGUIDE, http://scorecard.goodguide.com/env-releases/def/land_hrs.html (last visited Nov. 13, 2016).

⁵⁹ *Id.*

⁶⁰ *Id.*

⁶¹ *Id.*

⁶² *Id.*

⁶³ See Tano, *supra* note 6.

⁶⁴ *Id.*

⁶⁵ *Id.*

⁶⁶ Exec. Order No. 13084, *supra* note 9 (“meaningful and effective consultation and collaboration with Indian tribal governments in the development of regulatory practices in Federal matters that significantly or uniquely affect their communities”).

required to work with the tribes and can choose not to consult with the tribes.⁶⁷ EPA is required to “consult” with the Tribes, however, the agency is not required to follow any of the suggestions made during consultation.⁶⁸ Due to the amendment, in tandem with the Executive Order No. 13084, the EPA could now negotiate cooperative agreements with Native American tribes to undertake pre-remedial or remedial response actions at hazardous waste sites within the tribes’ jurisdictional boundaries. This would become beneficial to the Native American’s negotiations on CERCLA sites.

“In 2002, the Bush administration decided to shift the funding of SARA from the chemical and petroleum industries to the taxpayers.”⁶⁹ On December 30, 2009, the EPA issued an Advanced Notice of Proposed Rulemaking concerning Superfund financial responsibility.⁷⁰ In the Advanced Notice of Proposed Rulemaking, the EPA proposed that the PRPs would only be responsible for their proportion of the waste contribution on the site, rather than a lumping together of all the PRPs.⁷¹ This Advanced Notice of Proposed Rulemaking did not restore the old funding mechanism but reduced the likelihood that the taxpayers would have to pay if the PRP went bankrupt.⁷² There has been no development on this proposal since.⁷³ The updated version of CERCLA was thought to be enough to remediate the most polluted sites in a timely manner, but as this article will show, that may not be the case.⁷⁴

II. HANFORD NUCLEAR SITE CASE STUDY

As of October 2016, 1,337 NPL sites exist in the United States.⁷⁵ There are currently 51 NPL sites in Washington State.⁷⁶ Of the 51 NPL sites in Washington, the Hanford Nuclear Site, representing 4 of the 51 sites, is one of the largest cleanups undertaken in Washington State and the U.S.⁷⁷ This section discusses first the history of Hanford from the

⁶⁷ *Id.*

⁶⁸ *Id.*

⁶⁹ *SARA: Superfund Amendments and Reauthorization Act*, THE MSDS HYPER GLOSSARY, <http://www.ilpi.com/msds/ref/sara.html> (last updated Aug. 10, 2016).

⁷⁰ *Id.*

⁷¹ *Id.*

⁷² *Id.*

⁷³ *Id.*

⁷⁴ See generally John Shanahan, *How to Rescue Superfund: Bringing Common Sense to the Process*, THE HERITAGE FOUNDATION, <http://www.heritage.org/research/reports/1995/07/bg1047-how-to-rescue-superfund> (last visited Nov. 12, 2016).

⁷⁵ *Superfund: National Priorities List (NPL)*, U.S. EPA, <https://www.epa.gov/superfund/superfund-national-priorities-list-npl> (last updated May 6, 2016).

⁷⁶ *Superfund: National Priority List (NPL) Sites- by State*, U.S. EPA, <http://www2.epa.gov/superfund/national-priorities-list-npl-sites-state#WA> (last visited Nov. 12, 2016).

⁷⁷ *Region 10: The Pacific Northwest, Hanford, Washington*, *supra* note 3.

beginning of the site to the current contamination problem. Next, this section discusses the interaction between the Native Americans and Hanford throughout history.

A. History of the Hanford Nuclear Site

Of the most contaminated sites on the NPL list, the Hanford Nuclear Site is a large endeavor that has yet to be fully remediated. Hanford's history began at the beginning of World War II and the introduction of Nuclear Warfare. In the beginning, Hanford was just an important nuclear plant that helped supply the war but, in the end, it became one of the biggest contamination sites that still needs ongoing massive cleanup. This section discusses the historical application of the Hanford site during the war, and the extensive subsequent cleanup that began after the site closed.

1. The Beginnings of Hanford

In 1939, Albert Einstein, living in the U.S., warned President Franklin D. Roosevelt of “the dangers of the atomic technology in the hands of the Axis Powers.”⁷⁸ He urged the President that the U.S. should begin development of its own atomic research.⁷⁹ In late 1941, American efforts to design and build an Atomic Bomb received the codename “the Manhattan Project.”⁸⁰ A group of engineers scouting areas thought that Hanford's flat and arid environment was wholly suited to the needs of the Manhattan Project.⁸¹ Hanford was an “isolated wasteland, remote from population centers,” which could be used indiscriminately for national defense or natural resource extraction purposes.⁸² The resources of the desert landscape were seen as “inexhaustible.”⁸³ For instance, there was an abundant water supply, needed for the cooling of the reactors, as it was situated next to the Columbia River, plus the area's glacial sediment provided sand and aggregate for constructing large concrete structures.⁸⁴

⁷⁸ *51f. The Manhattan Project*, U.S. HISTORY, <http://www.ushistory.org/us/51f.asp> (last visited Oct. 21, 2016).

⁷⁹ *Id.*

⁸⁰ *Id.*

⁸¹ David Harvey, *History of the Hanford Site 1943-1990*, PACIFIC NORTHWEST NATIONAL LABORATORY 3-4 (Georganne O'Connor ed. 2001), available at <http://ecology.pnnl.gov/library/History/Hanford-History-All.pdf>.

⁸² *Id.* at 4.

⁸³ *Id.*

⁸⁴ *Id.*

In January of 1943, Hanford was selected for the plutonium production for the Manhattan Project.⁸⁵ Citizens were asked to vacate their homes and given 90 days to leave.⁸⁶ People from all over the country came to work at Hanford, replacing the citizens who were asked to vacate the area.⁸⁷ Eventually, the work force reached 51,000 people, but very few of the workers knew what they were building or what these facilities would do once they were completed.⁸⁸ The cost of these operations totaled about \$230 million.⁸⁹ “Plutonium from Hanford’s reactors went into the Trinity test bomb and into the bomb dropped on Nagasaki, Japan.”⁹⁰

By 1947, WWII was over but the Cold War was underway, and the first post-WWII expansion of Hanford soon followed.⁹¹ The Korean War, starting in 1950, led to the next expansion of operations at Hanford.⁹² “Hanford’s plutonium production reached its peak between 1956 and 1963, with the [nine] reactors along the river making plutonium” at their highest capacity.⁹³ This meant that the site was producing the most amount of plutonium it had created in the existence of Hanford. By 1975, alternative energy research had become another mission at Hanford.⁹⁴ Researchers at Hanford started working on solar, geothermal, fossil, wind, and organic energy sources.⁹⁵ “In the early 1980s, the mission of Hanford shifted back to defense production.”⁹⁶ Hanford’s “facilities were upgraded and used to produce material as part of President Ronald Reagan’s Strategic Defense Initiative, also known as ‘Star Wars.’”⁹⁷

2. The Cleanup of Hanford

In 1989, production of nuclear material was halted and the work began on the cleanup of the site.⁹⁸ “The operations at Hanford created

⁸⁵ Richland Operations Office, *History of Hanford Site and Cleanup Activities Briefing*, U.S. DEPARTMENT OF ENERGY 2 (Feb. 2010), available at <http://www.hanford.gov/news.cfm/DOE/UWLegalBriefing-w.pdf>.

⁸⁶ *Hanford History*, WASHINGTON STATE DEPARTMENT OF ECOLOGY, <http://www.ecy.wa.gov/programs/nwp/hanford.htm> (last visited Oct. 21, 2016) [hereinafter *Hanford History*, Washington State Dep’t of Ecology].

⁸⁷ *Hanford History*, HANFORD SITE, <http://www.hanford.gov/page.cfm/HanfordHistory> (last updated July 25, 2016).

⁸⁸ *Id.*

⁸⁹ *Hanford History*, Washington State Dep’t of Ecology, *supra* note 86.

⁹⁰ *Id.*

⁹¹ *Id.*

⁹² *Id.*

⁹³ *Id.*

⁹⁴ *Region 10: The Pacific Northwest, Hanford Superfund Site History*, U.S. EPA, <http://yosemite.epa.gov/R10/CLEANUP.NSF/0903AE66D99736E188256F04006C2D3A/045F8399CAA1B6BD882573FC0069B078?OpenDocument> (last updated Nov. 2, 2016).

⁹⁵ *Id.*

⁹⁶ *Id.*

⁹⁷ *Id.*

⁹⁸ *Id.*

one of the largest and most complex cleanup projects [of] the U.S. Weapons production” sites.⁹⁹ Hanford is divided into four sites (100, 200, 300 and 1110) depending on their function for the nuclear process.¹⁰⁰ In July of 1989, the EPA placed the four sites of Hanford on the NPL pursuant to CERCLA 42 U.S.C. §9601.¹⁰¹ The process of making plutonium was extremely inefficient, and thus, a massive amount of waste was generated, while only a relatively small amount of plutonium was produced.¹⁰²

Each area of the Hanford Nuclear site had a different way of disposing of their waste depending on the waste created. At the 100 area, the reactor operations generated several waste streams, such as solid waste and cooling water, which were disposed of in burial sites, introduced into the Columbia or released into the ground.¹⁰³ While at the 200 area, the plutonium was put in underground waste tanks.¹⁰⁴ Last, in the 300 area, the “low-level liquid and solid waste that was disposed of in ... ponds, trenches, burial grounds, and at waste disposal facilities in other areas.”¹⁰⁵

Due to the sheer size of the Hanford site, there was a significant amount of waste. The site produced “more than 43 million cubic yards of radioactive waste, and over 130 million cubic yards of contaminated soil and debris.”¹⁰⁶ Approximately, 475 billion gallons of contaminated water was discharged into the soil.¹⁰⁷ Some of the contaminants have made it to groundwater under the site.¹⁰⁸ “Over 80 square miles of groundwater is contaminated to levels above groundwater protection standards.”¹⁰⁹ This sheer amount of waste is what makes the site one of the largest cleanup sites in the U.S. The waste is highly toxic and was placed in the water table and the River. This contamination has had unknown effects on the surrounding Tri-Cities, Washington.¹¹⁰

To manage the massive cleanup process, there needs to be some timeline and goals put into place to hold the site accountable to the government. The USDOE, which operates Hanford, the EPA, and the State

⁹⁹ *Id.*

¹⁰⁰ *Region 10: The Pacific Northwest, Hanford, Washington, supra* note 3.

¹⁰¹ HANFORD SITE: Third CERCLA Five-Year Review Report, Hanford Site i (March 2012), available at http://www.hanford.gov/files.cfm/DOE-RL-2011-56_Rev%201__2-28-12_.pdf.

¹⁰² *Id.* at i.

¹⁰³ Harvey, *supra* note 81, at 33.

¹⁰⁴ *Id.*

¹⁰⁵ *Id.*

¹⁰⁶ *Region 10: The Pacific Northwest, Hanford, Washington, supra* note 3.

¹⁰⁷ *Id.*

¹⁰⁸ *Id.*

¹⁰⁹ *Id.*

¹¹⁰ See generally Annette Cary, Hanford Contamination Spread Across Public Highway, http://www.hanford.gov/files.cfm/DOE-RL-2011-56_Rev%201__2-28-12_.pdf (last visited Nov. 12, 2016).

of Washington Department of Ecology, signed a comprehensive cleanup and compliance agreement on May 15, 1989, known as the Tri-Party Agreement (TPA).¹¹¹ “The signing of the Tri-Party Agreement marked the formal beginning of [the mandated] cleanup of ... Hanford[.]”¹¹² The TPA “established a 30-year timetable for cleaning up Hanford’s toxic wastes.”¹¹³ The TPA was designed to document how the site achieved compliance with the CERCLA remedial action plan.¹¹⁴ The TPA defines and ranks CERCLA commitments, establishes responsibilities, provides a basis for budgeting, and reflects a concerted goal of achieving full regulatory compliance and remediation, with enforceable milestones in an aggressive manner.¹¹⁵ In the agreement, USDOE planned to remove as much waste from the tanks and turn it into glass through a process known as vitrification.¹¹⁶ Furthermore, other waste that was less radioactive would be mixed with cement or fly ash and poured into underground cement vaults.¹¹⁷ There were specific timelines for each of these processes, but as quickly noticed, these timelines were ambitious to start off. As such, there has been litigation over missed milestones and goals since the parties signed, which has resulted in multiple consent decrees.¹¹⁸ Recently, six tanks have been leaking nuclear waste into the environment and no emergency action has been taken to mitigate the leak.¹¹⁹ This site is not working fast enough nor with the amount of diligence needed to prevent further harm to the environment and the people of the area, including the Tribes of the area.

B. Native Americans and Their Interaction with Hanford

Historically, various Native American Tribes, including the Yakima, Nez Perce, Umatilla, Cayuse, and Walla Walla, inhabited the area that the Hanford Nuclear Site was built on.¹²⁰ As with other tribal cessations throughout history, Hanford and the Tribes have a tragic story of environmental injustice. This section details how the tribes originally

¹¹¹ *Tri-Party Agreement*, Hanford Site, <http://www.hanford.gov/page.cfm/TriParty> (last updated Aug. 21, 2016).

¹¹² Nuclear Safety Div’n, *Hanford Cleanup: The First Twenty Years*, OREGON DEPARTMENT OF ENERGY i (Jul 2009), available at <http://www.oregon.gov/energy/NUCSAF/docs/HanfordFirst20years.pdf>.

¹¹³ *Id.*; see also Marshall, *supra* note 12.

¹¹⁴ *Tri-Party Agreement*, *supra* note 111.

¹¹⁵ *Id.*

¹¹⁶ Nuclear Safety Div’n, *supra* note 113, at 2.

¹¹⁷ *Id.*

¹¹⁸ See generally Marshall, *supra* note 12.

¹¹⁹ *Frequently Asked Questions: Leaking underground tanks at Hanford*, WASHINGTON STATE DEPARTMENT OF ECOLOGY,

http://www.ecy.wa.gov/programs/nwp/sections/tankwaste/closure/pages/tank_leak_FAQ.html (last visited Oct. 21, 2016).

¹²⁰ *Region 10: The Pacific Northwest, Hanford Superfund Site History*, *supra* note 94.

interacted with Hanford and the subsequent health deterioration due to contamination.

1. History of the Tribes' Interaction

The Tribes that historically lived on the Hanford site peacefully inhabited the land without interruption from non-natives. The land in which they inhabited and its many spirits was their world, their culture, and their religion.¹²¹ The Tribes do not own the land they live on, but the land sustains them by providing for all their needs such as hunting and fishing, food gathering, and endless acres of grass on which to graze their horses.¹²²

“In 1855, the Umatilla, Cayuse and Walla Walla tribes individually ceded 6.4 million acres to the United States.”¹²³ The land “included the eastern half of what now is the Hanford Site.”¹²⁴ “The government signed a separate treaty with the Yakima Tribe and the Nez Perce.”¹²⁵ The tribes, through each of their treaties with the government, reserved the right to continue many practices on the ceded lands, such as to hunting, grazing their horses and cattle on their land, practice religious traditions at their “usual and accustomed areas (UAA),” as well as fishing in UAA.¹²⁶ The area they were allowed to fish on was the only stretch of the Columbia River that was still “free-flowing” and one of the few areas without any major agricultural development.¹²⁷ This was a “forever” right, as the Tribes understood it at the time the Tribes signed the Treaty.¹²⁸ Tribal members of all of the Tribes assumed that ceding the land would not mean they would not be allowed to fish on that land in the same manner, to the same degree they always had for as long as the Tribes lived.¹²⁹ Native Americans continued their cultural practices such as fishing salmon and other fish on the Columbia, despite the nuclear site

¹²¹ ODOE: *Nuclear Safety, Native American Interests at Hanford*, OREGON STATE, <http://www.oregon.gov/ENERGY/NUCSAF/pages/native.aspx> (last visited Nov. 12, 2016).

¹²² *Id.*

¹²³ *Id.*; see generally *Nez Perce Tribe*, COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION, <http://critfc.org/nez-perce-tribe/> (last visited Nov. 12, 2016); *The Confederated Tribes of the Umatilla Indian Reservation*, COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION, <http://critfc.org/the-confederated-tribes-of-the-umatilla-indian-reservation/> (last visited Nov. 12, 2016); *The Confederated Tribes of the Warm Springs Reservation of Oregon*, COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION, <http://critfc.org/the-confederated-tribes-of-the-warm-springs-reservation-of-oregon/> (last visited Nov. 12, 2016).

¹²⁴ *Id.*

¹²⁵ *Id.*

¹²⁶ *Region 10: The Pacific Northwest, Hanford Superfund Site History*, *supra* note 94.

¹²⁷ ODOE: *Nuclear Safety, Native American Interests at Hanford*, *supra* note 122.

¹²⁸ See Reprinted with permission from *Poison Fire, Sacred Earth, Testimonies, Lectures, Conclusions, The World Uranium Hearing, Salzburg 1992*, RADICAL.ORG 235-38 <https://www.ratical.org/radiation/WorldUraniumHearing/RusselJim.html> (last visited Oct. 21, 2016).

¹²⁹ *Id.*

dumping waste into the river.¹³⁰ This, however, has led to health concerns, which are addressed later.

After the cession of the land, the Hanford site began the production of waste, which would affect the Tribes' protected treaty rights to fish, hunt, and graze. For instance, the Yakima Reservation was 20 miles from the dumpsites in the Columbia River.¹³¹ As a result, "1.7 trillion gallons of liquid waste, radionuclides[,] and hazardous chemical" was released directly into the river that provided fish for the reservation since the start of production at Hanford.¹³² The Yakima Tribe was already dealing with hydropower dams cutting off the migrations of salmon and now had to deal with fish being contaminated.¹³³ Due to fish reduction from the Dams, the Yakima tribe and other tribes were worried about the fish being contaminated from the Hanford Site.¹³⁴ As a result, the Yakima tribe and other tribes were unable to sufficiently consume calories, and had to subsidize their diet with "cheap starches."¹³⁵ The waste released from Hanford not only altered salmon based diets, but it also prohibited the tribes from using their cultural and religious sites, such as Locke and Savage Islands in the Columbia River, Wahluke Slope and Rattlesnake Mountain south of Richland, WA.¹³⁶ Furthermore, groundwater was (and is) not safe for consumption due to leaking storage tanks on the site and the previous dumping the site performed.¹³⁷ The Tribes were facing significant injustices, with no way of advocating for themselves, until more recently.¹³⁸

USDOE has stated in their Tribal Program that "'it is the trust responsibility of the United States to protect tribal sovereignty and self-determination, tribal lands, assets, resources, and treaty and other federal recognized and reserved rights.'"¹³⁹ Therefore, the Tribes should be able to negotiate with USDOE, just as a state could, on how the site should be

¹³⁰ Kim Stringfellow, *Repercussions: Native Americans, SAFE AS MOTHER'S MILK: THE HANFORD PROJECT*, <http://www.hanfordproject.com/indians.html> (last visited Oct. 21, 2016).

¹³¹ Michelle Tolson, *Yakama Nation Fights for Nuclear Waste Cleanup at Hanford Site*, EARTH ISLAND JOURNAL (May 21, 2014), http://www.earthisland.org/journal/index.php/elist/eListRead/yakama_nation_fights_for_nuclear_waste_cleanup_at_hanford_site/.

¹³² *Id.*

¹³³ *Id.*

¹³⁴ *Id.*

¹³⁵ *Id.*

¹³⁶ ODOE: *Nuclear Safety, Native American Interests at Hanford*, *supra* note 122.

¹³⁷ *Prioritizing Cleanup of the Hanford Nuclear Reservation to Protect the Public's Health*, AMERICAN PUBLIC HEALTH ASSOCIATION, <http://www.apha.org/policies-and-advocacy/public-health-policy-statements/policy-database/2014/07/08/13/58/prioritizing-cleanup-of-the-hanford-nuclear-reservation-to-protect-the-publics-health> (last visited Oct. 21, 2016).

¹³⁸ See generally Daniel A. Bush, *The Yakama Nation and the Cleanup of Hanford: Contested Meanings of Environmental Remediation*, THE EVERGREEN STATE COLLEGE (2014).

¹³⁹ *Id.* at 7.

cleaned up.¹⁴⁰ Although, there was a program instated, the process was merely a consultation with the Tribes of the area, not a mandate to follow or take the suggestions of the Tribal leaders.¹⁴¹ Thus, even with the ability to consult, the injustice of failing to protect reserved right to fish, hunt and use their cultural sites still existed.

2. Health Effects of the Contamination

As mentioned previously, salmon are an important part of the culture of the surrounding Tribes, and with the increase of contamination, the Tribes were, and are, uniquely impacted by the radioactive waste.¹⁴² Salmon to the Tribes is more than just a staple food; it is a central feature of their culture.¹⁴³ Each of the surrounding Tribes respect the salmon, and the water they come from, above most else.¹⁴⁴ But aside from the cultural respect for the salmon, the fish were their main source of food.¹⁴⁵ The customary diet of the Native Americans of the region consisted of locally caught resident and migratory fish.¹⁴⁶ On average, the members of tribes consumed up to one and a half pounds a day, which is much higher than the national average, plus food gathered from other subsistence activities such as hunting and gathering.¹⁴⁷ Due to their high consumption, this places the Tribes at a higher risk of contamination by salmon than the suburban dwellers of the Tri-Cities.

Under CERCLA, it is important for the PRPs to consider the contamination and its effects on certain populations to assess how to clean up the waste. The Hanford Environmental Dose Reconstruction (HEDR) project was started to “determine the amounts of radioactive material that were released, the exposure pathways to people, and the radiation doses that may have been received.”¹⁴⁸ However, although the 1995 HEDR analysis did take into account the substantial radioactive contamination from “effluent” re-entering the river after cooling the fuel rods, HEDR based the Hanford dose “occurring through the river pathway for Native Americans on a lower consumption model [of] ninety pounds of fish per year.”¹⁴⁹ If the above estimation of a half-pound of

¹⁴⁰ *Id.*

¹⁴¹ *Id.* at 7-8.

¹⁴² See *We are all Salmon People*, COLUMBIA RIVER INTER TRIBAL FISH COMMISSION, <http://www.critfc.org/salmon-culture/we-are-all-salmon-people/> (last visited Nov. 12, 2016).

¹⁴³ *Id.*

¹⁴⁴ *Id.*

¹⁴⁵ *Id.*

¹⁴⁶ Stringfellow, *supra* note 131.

¹⁴⁷ *Id.*

¹⁴⁸ *Public Health Assessment for Hanford Site*, AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY 65 (May 17, 2011), available at <http://www.atsdr.cdc.gov/hac/pha/hanfordsite/hanfordsitefinalpha05172011.pdf>.

¹⁴⁹ Stringfellow, *supra* note 131.

fish consumed per day by the members of each of the tribes is accurate, the 90-pound estimation by HEDR is severely underestimating the consumption rate. Due to the miscalculation, tribal members are consuming a higher rate of contamination and the cleanup is not going to remediate that situation completely.

The HEDR also examined the contamination in the Columbia River by radioactive isotopes from water that had been used to cool fuel rods.¹⁵⁰ The dose reconstruction project concluded that most of the “danger” from the contamination would be from eating fish that had accumulated radiation.¹⁵¹ Native Americans were consuming the traditional fish-heavy diets in the 1960s, during the high release of radioactive waste into the Columbia from all nine fully operational reactors.¹⁵² The HEDR in the original study, however, did not consider the effects of consuming radioactive strontium at the rate the Native Americans were consuming.¹⁵³

Russell Jim, an elder of the Yakima Tribe suffering from throat cancer, said, “we [the tribes] tried to get on the list for compensation. Personally, I am convinced that much of the illnesses, thyroid problems and cancers are from Hanford.”¹⁵⁴ He was also worried about “birth defects in the tribe, as three counties around the reservation [had] been seeing high rates of anencephaly, a rare and fatal birth defect.”¹⁵⁵ The tribes are guaranteed special access to the salmon, which they make use of, but many Native American’s wonder if the fish are “OK” to eat, given the radioactive materials buried near there and continuous dumping of chemicals into the river.¹⁵⁶

“Although the cancers and birth defects suffered by regional Native Americans may be attributed to other sources of contamination, including other industrial practices found along the river,” there is a consensus in the health profession that the estimates of potential radiation exposure are inaccurately low and need to be reassessed.¹⁵⁷ This does not take into account the inhalation or exposure of dirt that people experience by being in proximity to the nuclear site.¹⁵⁸ Exposure from just breathing in the air is hazardous, as seen by workers who develop dis-

¹⁵⁰ *Id.*

¹⁵¹ *Id.*

¹⁵² *Id.*

¹⁵³ *Id.*

¹⁵⁴ Tolson, *supra* note 132.

¹⁵⁵ *Id.*

¹⁵⁶ *Id.*

¹⁵⁷ Stringfellow, *supra* note 131.

¹⁵⁸ See Darby C. Stapp, Joy K. Woodruff, & Thomas E. Marceau, *Reclaiming Hanford*, 8 *Common Ground X* (1995), available at http://www.nps.gov/archeology/cg/fd_vol8_num2/hanford.htm.

ease/asthma or other problems from the exposure to the harsh chemicals.¹⁵⁹

C. Success with CERCLA And SARA in Remediating Injustice

Native American involvement has increased in cleanup efforts since SARA; collective frustration has also increased.¹⁶⁰ The cleanup process dictated by CERCLA and SARA did and does not truly account for Native American culture and their connection to the land.¹⁶¹ The factors of the culturally significant plants, animals, and sacred areas, should be taken in account when evaluating the various pathways of exposure of the HRS.¹⁶²

The tribes have an investment in the success of the cleanup. As such, they have sought to become active participants in the process to make it more effective. As a sovereign nation, the Tribes, under their treaty, are “supposed to negotiate with the United States on a government-to-government basis.”¹⁶³ Therefore, the Yakima Tribe, and the other surrounding tribes, have continued to be active participants in the ongoing cleanup efforts at Hanford.¹⁶⁴ In 1993, USDOE started meeting with tribes, such as the Yakima Tribe and the Nez Perce Tribe, to get their input on how to clean up.¹⁶⁵ Certain members of the respective tribes have voiced concern over the program that was being used to cleanup Hanford and wanted to be more involved.¹⁶⁶ They also noted that Hanford had been managing its cultural resources in a piecemeal way, designating some areas worthy of protection and others not.¹⁶⁷ One member of the Wanapum Tribe commented, “How can I say this area is important and that area is important, but in between isn't? All the land is important.”¹⁶⁸ Most tribes believe that cleaning up in a piecemeal manner is not actually cleaning up the land.¹⁶⁹ It is more effective to look at an entire system, rather than proceeding in a scatter method like the efforts

¹⁵⁹ See Susannah Frame, *Sick Hanford workers speak out for the first time*, KING5 NEWS (April 9, 2014), <http://www.king5.com/story/news/local/investigations/2014/04/09/sick-hanford-workers-speak-out-for-first-time/13413724/>.

¹⁶⁰ Tano, *supra* note 6, at 1.

¹⁶¹ *Id.* at 2.

¹⁶² *Id.* at 1.

¹⁶³ Charles W., *Native Americans and The Environment*, ENVIRONMENTAL HEALTH & SAFETY ONLINE, <http://www.ehso.com/ehshome/Native%20Americans%20and%20the%20Environment.htm> (last updated Mar. 30, 2016).

¹⁶⁴ Tolson, *supra* note 132.

¹⁶⁵ *Id.*

¹⁶⁶ *Id.*

¹⁶⁷ *Id.*

¹⁶⁸ *Id.*

¹⁶⁹ Anthony DePalma, *Superfund Cleanup Stirs Trouble Waters*, NY TIMES (Aug. 13, 2012), <http://www.nytimes.com/2012/08/14/science/superfund-efforts-to-clean-waterways-come-with-a-risk.html?pagewanted=all>.

on the Passaic River, another CERCLA site.¹⁷⁰ All elements within an ecosystem are interrelated.¹⁷¹ Each element of the ecosystem has a role to play.¹⁷² Therefore, failing to clean up pieces is a failure to clean it all up.

In an effort to be more involved, the tribes conducted their own research to aid the EPA in their assessment of remediation standards. In 2007, Yakima Tribe created the *Exposure Scenario for Hanford Site Risk Assessment*, one of the first exposure scenarios submitted that took into account the Native American culture for cleanup standards.¹⁷³ It was the first step in the addressing the potential risks to tribes such as the Yakima Tribe, which is one of the tribes exposed to the Hanford contamination.¹⁷⁴ The Yakima Tribe's dependence on the consumption of local fish suggests the potential for the Tribe to be overly exposed from contamination from the Hanford site.¹⁷⁵ As such, the Yakima Tribe and other tribes of the area should be the population examined when evaluating a risk assessment for cleanup.¹⁷⁶

The EPA has to take into account the welfare of the Native Americans when looking at the cleanup of Hanford, but they are not required to choose those standards for the ultimate remediation standard.¹⁷⁷ More often the "suburban" rate is taken into account rather than the outdoor/active rate that takes into account the Native American lifestyle.¹⁷⁸ The suburban rate is defined by the consumption of salmon and interaction with the environment a typical suburban family has, which is a population less exposed than the outdoor/active rate.¹⁷⁹ USDOE's remediation plan aims only to reduce human health risk to levels acceptable for "exclusive industrial use" or "industrial use," which fails to consider "adult exposure to uncovered ground, child exposure scenarios, or tribal exposure scenarios."¹⁸⁰ This means, the tribes are not the target population to be protected. Rather, the plan is to remediate the site for other industrial use in the future. Furthermore, consultation does not mean informing the tribe of what the EPA decides, but can often mean trying to argue the tribe out of its research exposure factors. There is no mandate

¹⁷⁰ *Id.*

¹⁷¹ *What is Ecosystem Science?*, NATIONAL OCEAN AND ATMOSPHERIC ADMINISTRATION, <http://oceanservice.noaa.gov/facts/ecosci.html> (last visited Nov. 12, 2016).

¹⁷² *Id.*

¹⁷³ *See general Appendix W American Indian Tribal Perspectives and Scenarios*, U.S.

DEPARTMENT OF ENERGY, available at <http://energy.gov/sites/prod/files/EIS-0391-FEIS-Volume2-AppW-X-2012.pdf> (The first risk assessment submitted that considered the Tribe's own knowledge, expertise and cultural reserved rights when creating a cleanup standard).

¹⁷⁴ *Id.* at W-7.

¹⁷⁵ *Id.* at W-16-20.

¹⁷⁶ *Id.*

¹⁷⁷ Cram, *supra* note 11, at 806.

¹⁷⁸ *Id.* at 803.

¹⁷⁹ *Id.*

¹⁸⁰ *Prioritizing Cleanup of the Hanford Nuclear Reservation to Protect the Public's Health*, *supra* note 138.

that the EPA must take into account the exposure scenario and there is no mandate to inform the tribes that they are not using the exposure scenario.

One problem is that Native American's exposure assessments take into account cleanup to a pre-Hanford level rather than a current enjoyment, which is employed by the USDOE's risk assessment standard. As the *Traditional Tribal Subsistence Exposure Scenario* explains, the intent of the Tribes exposure scenario is to return the ecology to the original pattern of the land that restore the cultural resources and that is safe for consumption for substance and recreation.¹⁸¹ This is a different situation than for the general American population, where the intent of that exposure scenario is to allow people to continue to enjoy their current lifestyle.¹⁸² The level of cleanup desired by the Native Americans is of the lands' historically, pre-Hanford use.

Setting aside the issue of the heightened exposure assessment not being chosen, the environment is not being cleaned up efficiently regardless. The continuous leaking tanks release more waste into the groundwater that travels to the Columbia.¹⁸³ This leads to a continual exposure to the Native American Tribes and all people around the site.¹⁸⁴

III. PROPOSALS FOR THE CLEANUP TO A CULTURAL CONSCIOUS STANDARD

There needs to be more accountability for the agencies running Hanford to clean the land up to a sufficient level. Furthermore, the cleanup is not considerate of the Native Americans that love and live on the land. Their opinion is being pushed to the side. Thus, the site needs to: (1) mandate the use the Native American exposure scenarios; (2) hold the USDOE and EPA to deadlines at the site; and (3) build new double shell tanks to stop the leaking of waste.

A. Use the Native American Standards

The current remedial standard for Hanford is not feasible to clean up the site to a level that can protect the cultural resources of the Native Tribes of the area. CERCLA states that for a site to be sufficiently remediated, the carcinogenic risk of the area must be reduced to an "acceptable" risk.¹⁸⁵ The challenge of remediation at a site like Hanford is to "measure and manage the conditions of carcinogenic encounter—

¹⁸¹ *Appendix W American Indian Tribal Perspectives and Scenarios*, *supra* note 174, at W-99.

¹⁸² *Id.* at W-107.

¹⁸³ *Frequently Asked Questions: Leaking underground tanks at Hanford*, *supra* note 120.

¹⁸⁴ *See generally Appendix W American Indian Tribal Perspectives and Scenarios*, *supra* note 174 (explaining the differential impact on the Native Tribes).

¹⁸⁵ Cram, *supra* note 11, at 766.

titrating environmental contamination with human activity to achieve the appropriate balance of permissible dose.”¹⁸⁶ It is all about the feasibility of the remedial action.

Tribes are not treated as an equal participant in the cleanup process, regardless of their “consultation” and state status. The tribal members spend “enormous amounts of time justifying that they live and belong to a unique natural resource based outdoor population seems quite excessive.”¹⁸⁷ As one EPA staff member told Stuart Harris (mentioned above):

The Yakama and Umatilla have developed their own scenarios, so we run those. Unfortunately, they aren’t physiologically possible, so we don’t choose them. What they did, particularly the Umatilla, is the breathing rate that they chose was from a soldier digging a foxhole, so they were breathing heavy continuously. Which you can’t do, and so it makes your numbers go down. So for us, we can’t choose it because it’s not credible.” (The name was withheld from the article).¹⁸⁸

Even a member of the EPA does not believe that CERCLA is adequate to prevent the injustice of a remediation. The Tribes’ voices are not being heard. With their exposure assessment mandated by CERCLA to remediate Hanford, the tribes can return to their historical use of the land without fear of further contamination.

First, as mentioned previously, an exposure scenario needs to be temporally sensitive to the level of clean up historically needed by other cultures. USDOE’s exposure scenario is “temporally discriminating” against Native Americans by not including the Tribes’ historical use of the land. This means that the exposure scenario does not cleanup the land to a level necessary for the cultural use of the land to return to a pre-Hanford level. When the Native Americans create their exposure scenarios, the Tribes assess at their own practices, such as, fishing and hunting rates and gathering ability they had before Hanford. USDOE’s exposure scenario only looks at returning the land to a current usable standard, which discounts the previous uses of the land before the site was created. Thus, the standard should embody a pre-Hanford standard to apply to the cleanup.

Second, taking into account pre-Hanford standards during cleanup, rather than the current standards USDOE’s risk assessment uses,

¹⁸⁶ *Id.* at 797.

¹⁸⁷ *Id.* at 806.

¹⁸⁸ *Id.* (referring to an exposure scenario pertaining to “breathing rates” of Native Americans living in the area).

holds USDOE to a higher degree of cleanup under CERCLA. A higher standard of cleanup means more money; money the USDOE is not willing to spend when it is cleaning up the site to a perfectly usable standard. Thus, the standard is overlooked. However, using the Native American's exposure scenario adds more protection for the population that will be impacted most by the failure to reach the elevated threshold of cleanup. The exposure scenario will even protect those who are not the most vulnerable to the contamination. For instance, due to the exposure scenarios accounting for a higher rate of fish consumption, the cleanup would look at the carcinogenic risk of eating that amount of fish and clean up the river to a level to prevent, at that elevated consumption rate, health defects. When balancing the cost of the new standard of remediation and the benefit of saving a race of people from getting sick, the money seems insignificant.

Third, there should be a penalty for not remediating to a level protective of all the inhabitants of the area because it discriminates against a certain race. This is an entire race of people that have to justify their existence so they can regain land and practices historically stripped from them. Whether the penalty is accommodated into CERCLA via amendments is another story. Federal legislation is not always effective at producing the desired results. CERCLA and SARA have added members of the tribes, such as the Yakima Tribe and Nez Perce, onto the board of cleanup but have failed to actually take the Tribe's harm into consideration. Creating a penalty may be more effective by pressure of the Department of Ecology and the State that the NPL site is in.

Fourth, pressure from citizen groups can also prove effective in holding the site to the more inclusive level mandated by the tribe's exposure scenario. Making citizen suits from watchdog groups and members of the tribes easier can aid in forcing the agencies to consider the exposure scenarios in a more serious way. The lives of the individual tribal members matter and holding the agencies accountable to the affected people, those who are hurt the most, is important. Superfund reforms promise to protect minorities in their amendments, but tribes argue that Hanford's cleanup should not be considered complete until the site has been cleaned up to a level that accommodates Native American's lifestyles.¹⁸⁹ Thus, the exposure scenarios submitted by the Native Americans should be mandated for use in assessing the cleanup levels needed to finally close the site.

¹⁸⁹ *Id.* at 806.

B. Hold Hanford To Their Deadlines and the TPA

New cleanup standards will not be effective unless they meet the deadlines of the cleanup. In October 2010, USDOE informed Washington State it would not meet upcoming milestones, for cleanup, emptying tanks, and constructing the very complex treatment plant for turning the waste from the tanks into a glass form (“vitrification”).¹⁹⁰ In the Consent Decree, *State of Washington v. Chu*, Washington State sought a court enforceable consent decree with new schedules for the missed milestones.¹⁹¹ However, USDOE, once again, informed Washington State it would not be able to meet those new October 2010 milestones and consent decree schedules.¹⁹² The USDOE keeps missing deadlines and rather than getting penalized for the violations, there is litigation to change the dates. Dan Serres, Conservation Director for Columbia Riverkeeper, a citizen watchdog group, stated that if Hanford were a private company, they “would have been fired years ago.”¹⁹³ Holding the government accountable through penalties and removing incentives from other areas of the agency, such as withholding funds for other ventures of the agency, could help USDOE meet the deadlines they have been assigned.

If USDOE were held to its deadlines in a more punitive manner, it would have been penalized ten years ago.¹⁹⁴ But it blames Congress and a lack of money for its inability to follow the deadlines. This should be a top priority and take USDOE’s full attention, but it is not.¹⁹⁵ USDOE needs to be held accountable for its failures. It is important that USDOE meet the upcoming deadlines of their cleanup; but, without any repercussions, Hanford will continue to miss those deadlines. The deadlines are set to clean up the site in an expedited manner to prevent further harm to the environment and surrounding people. Thus, a penalty for future missed deadlines is appropriate to keep USDOE accountable for meeting future cleanup deadlines, because paying for missed deadlines will be more expensive than meeting the deadlines.

Another way to hold USDOE accountable is public participation from the areas surrounding the Hanford Site. The general public is unaware of what is happening at Hanford. They are unaware of what is mandated by CERCLA and what injustices are taking place for the surround-

¹⁹⁰ Washington State’s Proposal to Amend Hanford Consent Decree and Add Provisions to TPA *Washington v. Chu*, U.S.D.C Eastern No- 08-5085-FVS, 2 (March 31, 2014), available at https://www3.epa.gov/region10/pdf/sites/hanford/consentdecree_tripartyagreement_hanford.pdf.

¹⁹¹ *Id.* at 24.

¹⁹² See generally *Hanford*, WASHINGTON STATE, OFFICE OF ATTORNEY GENERAL, <http://www.atg.wa.gov/Hanford> (last visited Nov. 12, 2016).

¹⁹³ *Radioactive Waste Cleanup Deadlines at Hanford*, COLUMBIA RIVERKEEPER, <http://columbiariverkeeper.org/blog/epa-slaps-dept-of-energy-with-fines-for-missing-radioactive-waste-cleanup-deadlines-at-hanford/> (last visited Nov. 12, 2016).

¹⁹⁴ See *id.*

¹⁹⁵ See *id.*

ing tribes. If the citizens of the Tri-Cities, or anywhere in Washington, knew more about the failure to meet deadlines, there would be more citizen outrage. They would be aware that whole groups of people are being discriminated against in terms of the levels of cleanup. Citizen watchdog groups have been trying to get the information out through newsletters and tabling but have failed to stir the kind of frustration needed to keep the Hanford site to their deadlines. Citizen accountability will be important to holding USDOE, Washington State Department of Ecology, and the EPA to the goals designed by CERCLA. To create the arguably necessary incentive to clean up Hanford, public participation and penalties are needed to hold USDOE to its deadline on cleaning up the site.

C. Stop the Further Contamination of Hanford

Furthermore, cleanup standards are meaningless if the waste continues to leech out of the underground tanks. In February 2013, USDOE released a press release that T-111, a Single Shell Tank (SST), was leaking High-Level Nuclear Waste leaking into the soil and ground water.¹⁹⁶

CERCLA, along with RCRA, HWMA, and MTCA, requires a certain remediation step for on going leaking that needs to be done within a reasonable time after the leak begins. Under these environmental statutes the USDOE has to empty as much waste to prevent any further release into the environment “earliest practicable time” when a leak is detected.¹⁹⁷ However, USDOE has no plan to speed the emptying of Tank T-111 or the other potentially leaking SSTs (there are 6 leaking tanks including B-203, B-204, T-203, T-204, TY-105) to slow the leaking into the groundwater and ultimately the Columbia River.¹⁹⁸ USDOE currently does not have a plan to remove most of the contaminated soils from past leaks, and it proposes to cover those areas with soil caps.¹⁹⁹ USDOE’s environmental impact statement found that the soil contaminated by past leaks and discharges would continually contaminate groundwater far above drinking water standards for thousands of years, with repeated waves of contamination moving into the groundwater and traveling into the Columbia River.²⁰⁰ This is another violation that is not being penalized.

¹⁹⁶ *Frequently Asked Questions: Leaking underground tanks at Hanford*, *supra* note 120.

¹⁹⁷ 40 CFR 264/265.196(b)(1); WAC 173-303-640(7)(b)(i).

¹⁹⁸ *Empty Hanford’s Leaking High-Level Nuclear Waste Tanks*, Heart of America Northwest, <http://www.hanfordcleanup.org/leaking-high-level-nuclear-waste-tanks.html> (last visited on Nov. 14, 2016).

¹⁹⁹ Oregon Dep’t of Energy, Nuclear Safety Div’n, *Position Paper on Capping Waste Sites located on the Hanford Nuclear Site*, OREGON STATE, 9 (July 2005), available at <https://www.oregon.gov/energy/NUCSAF/HCB/docs/Capping.pdf>.

²⁰⁰ See generally *Frequently Asked Questions: Leaking underground tanks at Hanford*, *supra* note 120.

Storing waste in non-leaking tanks, such as Double Shell Tanks, will aid in the cleanup efforts. To build new Double Shell Tanks (DST) that will house the waste so it will not spill into the environment is an appropriate method. However, this idea has been sidestepped by the USDOE because it is costly and it will take up to 10 years to construct the new tanks.²⁰¹ Nevertheless, not taking steps like building new DST causes missed deadlines and further contamination of the surrounding environment, which is just as costly. The tanks could cost \$100 million per tank; however, when it comes to life of a whole race of people, cleaning up in a safer way is priceless.²⁰² This is a more cost-effective method to stop the leaking and give them leeway to empty the tanks as part of the closure plan. Furthermore, the leaking SSTs are a violation of environmental statutes, such as RCRA, CERCLA, and HWMA, and permit requirements. Thus, building new DST puts USDOE in compliance with these statutes. Building these tanks is a remediation plan that will be costly, but the benefits outweigh the costs.

Further leakage could prevent the tribes from getting the land back to a pre-Hanford level. Right now, the SSTs (and even one DST) are leaking into the Columbia and right into the Native American's promised fishing ground. The cleanup standards may require them to take into consideration the Tribes' diets, but if the waste keeps leeching into the water, the pre-Hanford standard does not matter. Continuous waste leeching into the water defeats the purpose of having the cleanup standards.

CONCLUSION

The combination of human rights and environmentalism is important to the future of the environmental movement. One group that is impacted by environmental harms more than others are the Native Americans. The government has historically victimized Native Americans and the Yakima Tribe and other tribes in the area, are no stranger to this persecution. The tribes that historically resided on the Hanford site reserved the right to fish and hunt in their usual and accustomed areas. Nuclear waste that is released into the environment, however, is negatively affecting this right to fish. It is important for the tribes, such as Yakima, Nez Perce, Umatilla, Cayuse, and Walla Walla, to have the land cleaned up to a pre-Hanford level so they can resume their reserved rights to fish and hunt on the usual and accustomed land.

The Hanford cleanup is one of the largest cleanups and still needs a lot of work. The contaminated groundwater from Hanford has

²⁰¹ *Id.*

²⁰² *Id.*

mixed with the Columbia, where juvenile salmon like to gather. Because the surrounding tribes' diet consists of mainly fish, the tribes cannot fish in their promised fishing grounds for fear of contamination.

Although the cleanup is governed by CERCLA, the statute originally was missing a cultural impact assessment for the cleanup standards that would take into account the diets of the Native American residents of Hanford.²⁰³ With the passage of the SARA came requirements that the governing body of a Native American tribe should be accorded the "same treatment as a state with respect to certain provisions of CERCLA" and that existing Native American exposure scenarios should be considered.²⁰⁴ Despite the comprehensive nature of CERCLA and SARA in combination, the environmental cleanup at Hanford is not using the Native American's exposure scenario. Thus, the U.S. isn't meeting its criteria of protecting all individuals.

Thus, Hanford needs to (1) use the Native American exposure scenarios; (2) hold the USDOE and EPA to deadlines at the site; and (3) build new double shell tanks to stop the leaking of waste. The future of the Native American tribes that surround the Columbia River depends on the cleanup of Hanford to a level that will prevent more contamination of their cultural practices. Without the changes proposed, the Native Americans living on the land will continue to experience massive negative health effects and lose the land they rely on. Their livelihood is on the line. Their history is on the line. The future of the Columbia River ecosystem is on the line. It is important to save their future.

²⁰³ See generally Tano, *supra* note 6.

²⁰⁴ *Id.* at 1.