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### From wasteland to waste site: the role of discourse in nuclear power's environmental injustices

Danielle Endres <sup>a</sup>

<sup>a</sup> Department of Communication, University of Utah, Salt Lake City, Utah, USA

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## From wasteland to waste site: the role of discourse in nuclear power's environmental injustices

Danielle Endres\*

*Department of Communication, University of Utah, LNCO 2400, 255 S. Central Campus Dr., Salt Lake City, Utah 84112, USA*

The purpose of this essay is twofold. First, I examine interdisciplinary literature to reveal the environmental injustices associated with the front and back ends of nuclear power production in the USA – Uranium mining and high-level nuclear waste (HLW) storage. Second, I argue that the injustices associated with nuclear power are upheld, in part, through discourse. This essay examines how the term “wasteland” is invoked in relation to HLW waste storage in the USA and contributes to the discursive formation of nuclear colonialism. Examination of this discourse not only contributes to current literature on nuclear colonialism but also to environmental justice research by arguing for the importance of examining the discursive aspects of environmental injustices. Further, the essay adds to current scholarship in energy justice by highlighting the environmental injustices associated with nuclear power.

**Keywords:** environmental justice; nuclear power; nuclear waste; nuclear colonialism; wasteland; discursive formations

With increasing attention being paid to mitigating the effects of global warming, there has also been a rise in deliberation about energy policy. In the United States, the election of Barack Obama as President and his appointment of Stephen Chu as the Secretary of Energy – both believers in global warming and advocates of lowering reliance on fossil fuels – promises to bring changes in national energy policy. National energy policy refers to federal government management and regulation of energy production, distribution, and consumption, which can have implications for state and local government energy policy. Major stakeholders in national energy policy can include the president, Congress, federal agencies (Department of Energy), state and local governments, Native American nations, industry, and publics. President Obama's (Whitehouse.gov 2009) national plan for “securing our energy future” includes decreased reliance on foreign sources of fossil fuels and increased reliance on domestic fossil fuels, renewable energy, biofuels, and nuclear power along with the promotion of energy efficiency.

As the USA and other nations develop and revise their energy policies, it is crucial to consider various forms of energy through the framework of environmental justice. The procurement, production, consumption, and distribution of energy in the United States and across the world disproportionately harm under-resourced people – indigenous peoples, the poor, and people of colour (Bullard *et al.* 2005, Sze 2005). Gedicks (2005, p. 169) argues, “The basic

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\*Email: [danielle.endres@utah.edu](mailto:danielle.endres@utah.edu)

assumption of US energy and resource policies, which is hardly ever questioned, is that other societies, whether they be in the Third World or on native lands in the advanced capitalist countries, should give up control of their own resources because the United States and other industrial societies refuse to control their own cultures of consumption". In sum, energy policy in the USA and abroad is embedded with environmental injustices.

The focus of this essay will be on nuclear power. Although it is billed as a clean form of power because it emits fewer greenhouse gasses than fossil fuel power plants, nuclear power is not immune from perpetuating environmental injustices. Empirical research in environmental justice has shown that marginalised communities are more likely to host polluting and toxic industries, including power plants, than non-marginalised communities (e.g. Commission for Racial Justice 1987, Mohai and Bryant 1992, Bullard 1994, Bullard and Johnson 2000). For instance, the Prairie Island Nuclear Power Plant (Xcel Energy) is adjacent to the Prairie Island Indian Community Reservation. Beyond the locations of nuclear power plants, the front and back ends of nuclear power production – Uranium mining and storage of high-level nuclear waste (HLW) – disproportionately harm marginalised peoples (Grinde and Johansen 1995, Yih *et al.* 1995, Kuletz 1998, Banjeree 2000, Hoffman 2001, Hecht 2003, Hooks and Smith 2004, Bullard 2005b, Sze 2005, Fan 2006a, 2006b). Uranium mining and HLW storage in the USA are particularly associated with Native American peoples and lands (Grinde and Johansen 1995, Yih *et al.* 1995, Thorpe 1996, Kuletz 1998, LaDuke 1999, Bullard and Johnson 2000, Hoffman 2001, Hooks and Smith 2004). Indeed, Native American activists use the terms radioactive colonisation or nuclear colonialism<sup>1</sup> to describe the phenomenon in which indigenous peoples are disproportionately targeted and harmed by the effects of nuclear technologies (e.g. Thorpe 1996, LaDuke 1999).

The purpose of this essay is twofold. First, I examine literature on environmental justice and nuclear colonialism to reveal the environmental injustices associated with the front and back ends of nuclear power production in the USA. While it is widely accepted that nuclear weapons production has disproportionate harms for indigenous populations, my examination extends the discussion of nuclear colonialism to explicitly examine commercial nuclear power production. Second, I argue that the injustices associated with nuclear power are justified, in part, through discourse. Building from research highlighting the discursive aspects of nuclear colonialism (e.g. Kuletz 1998, Endres 2009), I examine how the term "wasteland" is invoked in relationship to HLW storage in the USA. I contend that this term circulates within the nuclear colonialism "discursive formation" (Foucault 1972). My analysis reveals that the term is both controlling and resistive – that is, it may be used to justify HLW nuclear waste siting but also opens avenues for resisting these policies. Uncovering these strategies of control and resistance increases our understanding of the complexity of discourse's role in nuclear colonialism. Highlighting the role of discourse not only contributes to current literature on nuclear colonialism but also contributes more broadly to environmental justice research by arguing for the importance of examining the discursive aspects of environmental injustices. An understanding of the discursive elements of environmental injustices complements research that focuses on empirical documentation of environmental injustices and policy analysis. As environmental injustices are made of both material practices and discursive practices, it is crucial to understand both to move towards environmental justice.

### **Environmental and energy justice**

Environmental justice refers to the rights of all people to benefit from a healthy environment, to be treated fairly in environmental decision-making, and to be meaningfully

involved in environmental decision-making (e.g. Hofrichter 2002, O'Connor 2002, Agyeman and Evans 2004, Agyeman 2005). Environmental injustice is the inverse of environmental justice, a common sign of which is that toxic waste and pollution and environmental degradation are disproportionately harmful to members of marginalised communities (e.g. Bullard and Chavis 1993, Weaver 1996, Faber 1998, Hofrichter 2002, Visgilio and Whitelaw 2003). The environmental justice movement formed in response to lived experiences of people and empirically documented instances of environmental injustices in their communities. Members, locations of struggles, and issues in the environmental justice movement are diverse (Schlosberg 1999, Cole and Foster 2001, Bullard 2005a, 2005b, Pezzullo and Sandler 2007). Cole and Foster (2001) identify myriad roots of environmental justice in civil rights, indigenous, labour, and anti-toxics movements as well as in academia. Despite its diversity, the movement subscribes to a common set of seventeen principles adopted at the first National People of Color Environmental Leadership Summit held in Washington, DC in 1991 (Principles of Environmental Justice 2001), although Agyeman (2005) notes that on-the-ground practices do not always match the principles. These principles create a framework of sorts for determining whether the goals of environmental justice have been met in particular situations. Bullard (2005a, p. 10) argues that environmental justice is a framework that “attempts to uncover the underlying assumptions that may contribute to and produce unequal protection” (see also Bullard and Johnson 2000). This essay uses this framework to analyse how discourse can reveal some of the underlying assumptions that justify environmental injustice. It also reveals how discourse can be used to resist environmental injustices.

An emerging area of research and activism in environmental justice examines domestic and international energy policy (e.g. Bullard *et al.* 2005, Agarwal *et al.* 2002, Sze 2005). Sze (2005, p. 101) argues,

Environmental justice energy activism reflects the specific interpretive responses of people of color to the implementation of energy systems that are particularly destructive toward racial minorities in the United States. The burdens of large-scale energy production have destroyed communities in many nations across the world.

Injustices in energy production and policy span across the range of energy sources from coal to oil to nuclear power (Sze 2005).<sup>2</sup>

### **The environmental injustices of nuclear power**

One aspect of energy justice focuses on nuclear power. From cradle to grave, nuclear power risks environmental injustices. As noted above, nuclear power is often touted for being a clean form of energy (e.g. Schwarz and Reiss 2005). Yet, this merely refers to the process of fuel production in a nuclear reactor and the amount of greenhouse gases produced in the process. When other parts of the nuclear fuel cycle are considered and when being clean refers to more than just the level of greenhouse gasses produced, it becomes apparent that nuclear energy is not as clean as is popularly believed. However, before inspecting nuclear power from an environmental justice framework, it is important to discuss the nuclear fuel cycle.

The nuclear fuel cycle refers to the entire process involved in the production of nuclear energy (see Figure 1, US Nuclear Regulatory Commission 2008). It begins with Uranium, which is mined and milled into yellowcake and then processed to a gaseous form that is suitable for enrichment (hexafluoride – UF<sub>6</sub>). Uranium enrichment increases the

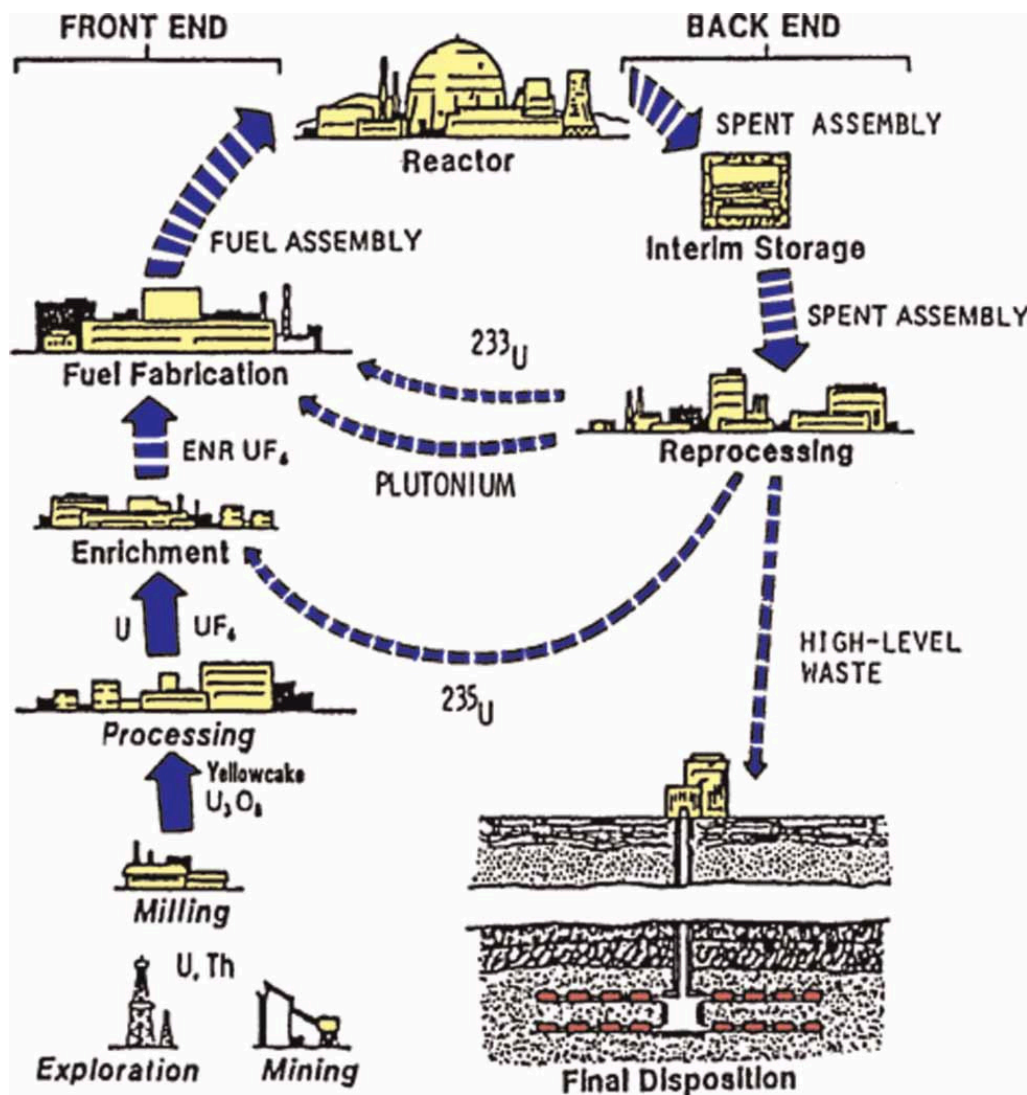


Figure 1. Nuclear fuel cycle (US Nuclear Regulatory Commission 2008).

concentration of Uranium 235, which, unlike the more prevalent Uranium 238, is capable of a fission reaction. After enrichment, fuel rods are produced. Fuel rods are used in a reactor core of a nuclear power plant to produce a fission reaction that heats water to create steam power. When nuclear fuel rods are spent (SNF), they are moved to interim storage either in storage pools or above ground dry cask storage. Currently, interim storage for US nuclear power plants occurs on site at over 120 locations in 39 states. Following interim storage, SNF can either be (1) reprocessed, fabricated into fuel rods, and run through the reactor again, or (2) sent to a permanent HLW repository. The USA neither currently allows reprocessing of commercial fuel rods nor currently operates a HLW repository in the USA (although, as I will discuss later, the Department of Energy (DOE) recently submitted a license application to the NRC for the Yucca Mountain High-Level Nuclear Waste Repository).

### *Nuclear colonialism*

As mentioned above, nuclear colonialism describes how the nuclear production process – including both nuclear weapons production and nuclear power – disproportionately

harms indigenous people worldwide.<sup>3</sup> The Indigenous Environmental Network (2002) wrote:

The nuclear industry has waged an undeclared war against our Indigenous peoples and Pacific Islanders that has poisoned our communities worldwide. For more than 50 years, the legacy of the nuclear chain, from exploration to the dumping of radioactive waste has been proven, through documentation, to be genocide and ethnocide and a deadly enemy of Indigenous peoples. . . . United States federal law and nuclear policy has not protected Indigenous peoples, and in fact has been created to allow the nuclear industry to continue operations at the expense of our land, territory, health and traditional ways of life. . . . This disproportionate toxic burden – called environmental racism – has culminated in the current attempts to dump much of the nation’s nuclear waste in the homelands of the Indigenous peoples of the Great Basin region of the United States.

Examples of nuclear colonialism in the United States include Uranium mining and milling on reservation lands in the Black Hills and Four Corners regions, nuclear testing on land claimed under the 1863 Treaty of Ruby Valley by the Western Shoshone, and HLW storage sites considered on Western Shoshone, Southern Paiute, and Skull Valley Band of Goshute lands (Nelkin 1981, Grinde and Johansen 1995, Kuletz 1998, La Duke 1999, Hoffman 2001).

The phenomenon of nuclear colonialism is empirically documented. The book *Nuclear Wastelands*, edited by Makhijani *et al.* (1995), reveals that indigenous people in the USA and globally are disproportionately burdened by the production of nuclear weapons. Further, Hooks and Smith (2004, p. 572) demonstrate that US military sites are disproportionately located on or near Native American lands. While these studies focus primarily on military applications of nuclear technologies, there is also evidence to suggest that Uranium mining for nuclear power production and HLW storage also fall within the pattern of nuclear colonialism (Nelkin 1981, Hoffman 2001). Hoffman (2001, p. 462) details the “extraordinary unequal distribution of benefits and burdens at each stage of the [nuclear fuel] cycle” imposed upon Native American nations in the USA, particularly by Uranium mining and HLW disposal.

Nuclear colonialism is a type of environmental injustice. In part, nuclear colonialism is environmental racism. According to Bullard (1999, p. 6), “environmental racism combines with public policies and industry practices to provide benefits for whites while shifting costs to people of color”. Yet, nuclear colonialism is also a form of colonialism. Native Americans, unlike other marginalised racial groups in the USA, are members of over 150 distinct sovereign tribal nations and each holds a unique legal relationship with the federal government. As Suagee (2002, p. 227) notes, “Although Indian people have suffered much discriminatory treatment from people who apparently define Indian identity in primarily racial–ethnic terms, the fact that Native American governments are sovereign governments is a significant distinction between them and other kinds of minorities”. Although Native Americans in the USA are sovereign governments, they are still faced with a system of colonialism. Gedicks (1993, p. 13) argues that Native Americans are embedded within a system of resource colonialism under which “native peoples are under assault on every continent because their lands contain a wide variety of valuable resources needed for industrial development”. Nuclear colonialism is a form of resource colonialism that faces Native Americans in the USA and other indigenous peoples worldwide.<sup>4</sup>

### *The cradle of nuclear power*

All nuclear power production must begin with Uranium mining, which is inextricably linked with indigenous peoples globally (Yih *et al.* 1995). Within the USA, approximately

66% of the known Uranium deposits are on reservation lands, as much as 80% are on treaty-guaranteed land and up to 90% of Uranium mining and milling occurs on or adjacent to Native American land (Kuletz 1998). Uranium is mined for both commercial nuclear power plants and for military purposes. Makhijani and Hu (1995) argue that it is difficult to separate civilian and military nuclear production because of overlap and lack of information. However, Hoffman (2001) notes that although the earliest Uranium mining in the USA was used for nuclear weapons, the 1954 Atoms for Peace programme resulted in Uranium mining for commercial nuclear power plant development. Although Uranium mining lessened in the USA in the 1980s, renewed interest in expanding nuclear power production has resulted in industrial interest in re-opening shuttered mines or opening new mines (Gaynor 2007, Barringer 2008, Saiyid and Harrison 2008, Yurth 2009). Several Native American nations are currently resisting Uranium mining on their lands (Navajo Nation 2005, Capriccioso 2009, Lakota Country Times 2009). Even if nuclear power in the USA draws from foreign sources of Uranium, Yih *et al.* (1995, p. 105) report that “indigenous, colonised, and other dominated people have been disproportionately affected by Uranium mining worldwide”.

Past Uranium mining and milling in the USA resulted in severe health and environmental legacies for affected people and their lands. From Uranium mining operations on Navajo land during the Uranium boom (1950s–1980s), there are at least 450 reported cancer deaths among Navajo mining employees (Grinde and Johansen 1995). The devastation extended beyond employees to the larger communities surrounding the mines and mills. The United Nuclear Uranium mill at Church Rock on the Navajo reservation is the site of the largest nuclear accident in the USA. On 16 July 1978, over 100 million gallons of irradiated water contaminated the Rio Puerco River, plant and animal life, and Navajos (Grinde and Johansen 1995, Yih *et al.* 1995).<sup>5</sup> Even now, the legacy of over 1000 abandoned mines and Uranium tailing piles is radioactive dust that continues to circulate through the land (Grinde and Johansen 1995). Yih *et al.* (1995) cite a statistically significant likelihood of birth defects and other health problems for women living in the vicinity of mine dumps and tailing piles.

### ***The grave of nuclear power***

An essential consideration for the viability of nuclear power is HLW storage.<sup>6</sup> In the USA, the Nuclear Waste Policy Act (NWPA) vests responsibility with the federal government for permanently storing HLW from commercial and governmental sources in a national repository. High-level waste is a classification for the “hottest” and longest lasting forms of radioactive waste that emit harmful levels of radiation for hundreds of thousands of years (US Nuclear Regulatory Commission 2007). Both commercial nuclear power reactors and military programmes produce HLW. The majority of HLW from commercial nuclear power reactors is in the form of spent nuclear fuel (SNF). According to the former Secretary of Energy Spencer Abraham (2002), “We have a staggering amount of radioactive waste in this country”. Specifically, the US Department of Energy (2008a) estimates 56,000 metric tons of SNF from commercial reactors, government research reactors, and nuclear subs and 22,000 metric tons of high-level waste from nuclear weapons production. HLW from commercial nuclear power exceeds that from weapons production. These 78,000 metric tons already exceed the NWPA-mandated 70,000 capacity of the national repository site.

In an over twenty-year process of researching and authorising a federal HLW repository site, the only sites that were, or are being given serious consideration, are on Native American land. These are the Yucca Mountain HLW Repository, the Monitored Retrievable

Storage (MRS) programme, and the Private Fuel Storage (PFS) interim HLW site on the Skull Valley Band of Goshute Reservation.

The Yucca Mountain HLW Repository site is in Nevada, about 100 miles from Las Vegas. Although the DOE claims that Yucca Mountain site is located on federally controlled land (Nevada Test Site and Nellis Air force Base), the use of the land is contested by the Western Shoshone and Southern Paiute, who claim treaty-based and spiritual rights to the land (Harney 1995, Kuletz 1998). The Western Shoshone lay claim to Yucca Mountain under the Ruby Valley Treaty of Peace and Friendship of 1863.<sup>7</sup> In 2002, the Secretary of Energy, the President, and both houses of Congress authorised the Yucca Mountain site. Despite authorisation, the Yucca Mountain site is not yet accepting waste. In June 2008, the DOE applied to a license from the Nuclear Regulatory Commission for the Yucca Mountain site. However, President Obama's fiscal year 2010 budget, if passed, will cut the majority of funding for the Yucca Mountain site, essentially resulting in what Senator Harry Reid (as cited in Power 2009) calls the "death of the failed Yucca Mountain idea".

Congress created the Office of the Nuclear Waste Negotiator in 1987 through an amendment to the NWSA. The Office's goal was to find a site for temporary MRS of HLW through a voluntary siting process. Although both state and local governments and Native American governments were approached by the office, "when the siting process was implemented, however, the only parties who ultimately remained in serious consideration turned out to be Native American tribes" (Gowda and Easterling 2000, p. 917). Winona LaDuke (1999, p. 103) explains this by stating that "a good deal of money and influence was intended to persuade tribes to accept the waste". The Office offered an initial 100,000 dollar grant to potential sites and the possibility of 5 million dollars if the site was selected. Sixteen Native American nations were involved in MRS studies. Four Native American nations reached the final stage of consideration for an MRS site: the Skull Valley Band of Goshute, the Mescalero Apache, the Tonkawa, and the Fort McDermit. Although the Skull Valley Band of Goshute was poised to sign an agreement for an MRS storage facility, Congress cut funding for the Office of the Nuclear Waste Negotiator MRS programme in 1994 before an agreement was made.

Following the failed MRS programme, PFS proposed a temporary HLW site on the Skull Valley Band of Goshute Reservation in Utah, about 70 miles from Salt Lake City. PFS is a private corporation made up of a consortium of energy companies that are facing a crisis with on site storage. In 1997, PFS and the Skull Valley Band of Goshute government signed a lease to store 40,000 metric tons of HLW in the form of spent fuel rods on 40 acres of the reservation. Even though the site received a license from the Nuclear NRC in 2006, subsequent decisions by the Bureau of Indian Affairs and the Bureau of Land Management stopped the site (Bulkeley 2006, Fahys 2006, Inside NRC 2006).<sup>8</sup> Steven Hoffman (2001) details the PFS proposal in his argument that it violated environmental justice.

Contemporary deliberation about energy policy includes advocates for expanded use of nuclear power. Current research in nuclear colonialism supports the claim that nuclear power is not immune from environmental injustices, both globally and in the USA. Across the globe, Uranium mining and milling harms indigenous populations and expansion of nuclear power production could increase demand and further harm. No matter from where US power plants procure Uranium, it is likely to come at the cost of harm to marginalised indigenous people. Further, whether HLW is stored at Yucca Mountain in a permanent facility, on-site at nuclear power plants, or at some other location, there are associated environmental injustices. In short, based on years of environmental justice



research on the proximity of toxic waste sites to marginalised communities (e.g. Commission for Racial Justice 1987, Bullard and Johnson 2000), it is unlikely that a nuclear waste site would be sited in an affluent, white neighbourhood.

### Discursive formations

Environmentally unjust policies have material environmental and health harms on communities, such as pollution, cancers, and other health problems. However, environmental injustices are also closely linked with discourse. In other words, environmental injustices are both symbolic and material. In assessing the discursive realm of environmental injustices, it is useful to note that discourse can play an important role in constituting realities and policies (Berger and Luckman 1967). To take effect, policies must be justified through language and argumentation. Similarly, resistance to environmental injustices involves the use of discourse. The analysis in this section highlights the complex role that discourse can play in the perpetuation of and resistance to environmental injustices. This analysis builds from scholarship in the field of nuclear communication that studies “overlapping spheres of organizational and public communication produced in and around the nation’s nuclear-industrial infrastructure” (Taylor *et al.* 2005, p. 364; see also Taylor 2003, Kinsella 2005, Taylor and Kinsella 2007, Taylor *et al.* 2007). Specifically, analysis of discourse of HLW storage reveals how nuclear colonialism is justified and challenged through an interconnected discursive formation.

Michel Foucault (1972) introduced the concept of a discursive formation. He views discourse as a complex differentiated practice of representation that reflects the circulations and dispersions of power/knowledge in a particular historical moment. Stuart Hall (2001, p. 72) suggests that for Foucault, discourse “governs the way that a topic can be meaningfully talked about and reasoned about”. A discursive formation is a set of statements across multiple dispersed texts that have order, despite their seeming difference. Foucault (1972, p. 38) wrote,

Whenever one can describe, between a number of statements, such a system of dispersion, whenever, between objects, types of statement, concepts, or thematic choices one can define a regularity (an order, correlations, positions and functionings, transformations), we will say, for the sake of convenience, that we are dealing with a *discursive formation*. (Italics in original)

Dispersion is important to a discursive formation. Foucault (1972, p. 37) states that dispersion is the “various strategic possibilities that permit the activation of incompatible themes, or, again, the establishment of the same theme in different groups statement”. In other words, a discursive formation is a concoction made of a variety of statements. Discursive formations are both enabling and constraining in that a discursive formation both governs and opens the possibilities for resistance to discourse about a given topic.

Nuclear colonialism is not only a material empirical phenomenon as I have shown above, but it is also a discursive formation. Kinsella (2005, p. 49) describes nuclear discourse as a “formation of power/knowledge linking institutions, practices, and a dense network of representations and meanings”. Endres (2009) identifies nuclear colonialism, a subset of nuclear discourse, as a discursive formation that links together both nuclearism and colonialism. Foucault (1972, p. 68) avers that to uncover a discursive formation, the critic will “define the system of formation of the different strategies that are deployed in it; in other words, if one can show how they all derive (in spite of their sometimes extreme diversity, and in spite of their dispersion in time) from the same set of relations”.

Endres (2009) examines several different strategies employed by the federal government that circulate within the nuclear colonialism discursive formation including naming practices, rhetorical exclusion, shifting the burden of proof, and strategic silence. Recognising the complexity of the nuclear colonialism discursive formation, Endres (2009) calls for further research. Departing from an exclusive focus on the discourse of the federal government, my analysis of the wasteland term attends to the broader circulation of the nuclear colonialism discursive formation in society as well as the resistive strategies that are enabled.

### From wasteland to waste site

Wasteland, like most words, is polysemous. In common parlance, wasteland is used to refer to an area that is barren, arid, and uninhabitable for humans. It is often synonymous with desert. Wasteland takes on a different meaning when considered in relation to nuclear technologies and nuclear colonialism. As Makhijani *et al.* (1995) suggest in their book *Nuclear Wastelands*, the legacy of nuclear weapons production is a series of toxic sites, or wastelands, across the world that endanger human health and the environment. Similarly, Uranium mining/milling for nuclear power (and nuclear weapons) has created wastelands, such as radioactive Uranium tailings on the Navajo and Laguna Reservations in the USA (Grinde and Johansen 1995). In addition to the creation of wastelands, Uranium mining and milling sites and HLW storage proposals are often located in regions of the country that are already perceived to be wastelands, such as the desert southwest region of the United States (Kuletz 1998). Native American reservations and lands are also located in regions of the country that were perceived by the USA federal government as wastelands – whether they were traditional homelands or sites of relocation – during the era of reservation creation in the late 1800s and early 1900s (Hooks and Smith 2004). While seemingly diverse, these various ways of thinking about wasteland interact within the discursive formation of nuclear colonialism.

The southwest region of the United States includes Utah, Nevada, Arizona, New Mexico, Colorado, and parts of east California and west Texas. The terrain of the American southwest is primarily desert, including the Great Basin Desert, the Navajo Desert (Colorado Plateau), the Mojave Desert, the Chihuahuan Desert, and the Sonoran Desert. Kuletz (1998, p. 10) asserts that “though the nuclear landscape can be said to exist throughout the United States, nowhere has it emerged as extensively as in the Southwest interdesert region”. While Kuletz’s nuclear landscape includes both civilian and military nuclear sites, both the front and back ends of nuclear power production rely on the American desert southwest. Considering HLW storage, all of the proposed sites for interim or permanent storage of SNF from our current and future nuclear power plants have chosen sites located in the desert southwest, namely the Yucca Mountain and Skull Valley sites.

Although deserts are commonly seen as wastelands by White European-Americans, the indigenous inhabitants of the American Southwest did not view them as such (Crum 1994, Maryboy and Begay 2000, Pritzker 2000). Native Americans of various nations have lived in the desert southwest for what they describe as “time immemorial” (Crum 1994, Harney 1995). Pritzker (2000, p. 3) states that the southwest has had the “longest contiguous human habitation” in North America. The desert regions of the southwest, though mostly arid, were not uninhabitable or barren for indigenous populations. Statements by Native Americans reveal ancestral and contemporary perspectives on the desert. For instance, Margene Bullcreek of the Skull Valley Band of Goshute points out that although it seems to be a lifeless place, there is great peace and spirituality in the region; “it is sacred land” (personal

communication, 26 January 2008). Western Shoshone and Southern Paiute avow that Yucca Mountain is part of their traditional homeland that holds cultural, spiritual, and resource value (Crum 1994). Edward Smith of the Southern Paiute Chemehuevi Indian Tribe illustrates this point,

Our people, along with other Southern Paiute tribes and Western Shoshone and Owens Valley Paiute peoples have lived, traveled, worked, raised children, worshiped, harvested plants, animal, water and mineral resources and died in these lands for thousands of years. . . . These lands are part of our people and we are part of these lands. . . . This land is and will always be Indian land. (US Department of Energy 2001b, p. 23)

In all of these examples, it is not just any land that is valued nor is it an abstract value of property; these Native Americans of various nations value the desert southwest because it is their sacred homeland. Wasteland is not a term that comes up in Native American descriptions of land, unless in reference to their land being turned into a wasteland from toxic pollution (LaDuke 1999).<sup>9</sup>

When the first European explorers encountered the Southwest, the wasteland label for the region emerged. Deserts were a terrifying obstacle to early European-American settlers (McPhee 1981). Explorer John Charles Fremont was one of the first to explore and document the Great Basin desert region in 1844. He described it as barren and full of hardship. Limerick (1985, p. 41) asserts that Fremont perceived the desert as “‘barren’ by virtue of the absence of familiar and usable plants, especially forage for domestic animals, and by virtue of the lack of a contiguous ground cover”. To a people whose cultural and technological roots were firmly agricultural, the desert represented a barrier to living and economic prosperity (Limerick 1985).<sup>10</sup> Early explorers portrayed the desert as wasteland because of perceived lack of cultivation potential and economic prosperity. Yet, considering Native American perceptions of the desert and ecological diversity, the desert is not a wasteland. Worster (1985, p. 69) writes, “Almost nowhere was the American desert simply a stretch of empty sand; everywhere there was life. Americans had only to take the trouble to look”. In fact, Utah and Nevada, both primarily desert terrain, rank fifth and sixth in the USA for their high level of biological diversity (NatureServe 2002). The discourse of the desert, like wasteland, is dispersed and polysemous.<sup>11</sup>

The negative perception of the desert as wasteland has persisted to this day. The American desert southwest is often seen negatively as a wasteland. “We Americans have tended to regard our deserts as wastelands, and nowhere has this been more literally true than the Great Basin” (Zwinger 1996, p. 42). In addition to early explorer reactions to the desert, an article in the magazine, *Armed Forces Talk*, described the Nevada Test Site as a “Damn good place to dump used razor blades” (cited in Gallagher 1993, p. xxiv). Moreover, Gallagher (1993) notes that the Atomic Energy Commission referred to the Nevada Test Site as a desert wasteland.

Once a region is perceived and named as a wasteland, it is easy to think of it as a place for storing and disposing of wastes. Butler (1997, p. 8) argues that “naming is at once the setting of boundary, and also the repeated inculcation of a norm”. The naming of the land as a wasteland allows for the destruction of such lands in a system of nuclear colonialism. The American desert southwest is being transformed into a literal wasteland. As Beck (2001, p. 69) notes, “Much of the Southwest is an achieved apocalypse, a space laden with invisible toxic evils”. Kuletz (1998) details the numerous nuclear, military, and toxic facilities that litter the landscape of the southwest including the Nevada Test Site (nuclear testing), Uranium mines and mill tailing piles, the Dugway Proving Grounds (chemical weapons), and low-level nuclear waste (Energy Solutions, formerly Envirocare).

Referring to the toxicity of the American southwest, Terry Tempest Williams (1991, p. 241) contends that “a blank spot on the map translates into empty space, space devoid of a people, a wasteland perfect for nerve gas, weteye bombs, and toxic waste”. Once the “wasteland” of the desert southwest started to become degraded from toxic sites, it began to turn into a literal wasteland, attracting more and more pollution. Thus, the naming of the region as a wasteland has material consequences for land-use policy. Contemporary HLW siting controversies at Skull Valley and Yucca Mountain summon the complicated connotations of wasteland as one of the justifications for HLW storage at those locations.

### *The Yucca Mountain site*

DOE public documents describe Yucca Mountain as a desert wasteland. A brochure, *National Repository at Yucca Mountain* (US Department of Energy 2008b, p. 6), describes the site as a “remote area of the Mojave”, and “one of the driest regions in the United States”. The brochure also contains multiple pictures of the Yucca Mountain site (Figure 2) that reveal expanses of brown landscape with no visible plants, animals, or people. A document called *Why Yucca Mountain? Frequently Asked Questions* (US Department of Energy 2008c, p. 1) notes the site’s proximity to an already contaminated wasteland: “the site sits adjacent to the Nevada Test Site, the ground-zero location of over 800 nuclear bomb tests conducted up until the early 1990s”. In describing Yucca Mountain, the DOE Yucca Mountain web site (US Department of Energy 2004) states, “There are no known natural resources of commercial value at Yucca Mountain (such as precious



Figure 2. Yucca Mountain (US Department of Energy 2008b, p. 1).

metals, minerals, oil, etc.)” Although the documents do not use the word wasteland, the combination of statements and images in the documents justify the Yucca Mountain site as a good place to store HLW because of its desert wasteland qualities.

In this discursive pattern, the desert southwest – once perceived to be a wasteland by European-Americans – is useful and valuable to the USA as a site for disposing of waste. After all, what better place to store wastes than a place that has been named a wasteland? Additional destruction of a wasteland land seems less insidious than destroying other non-wastelands. Steve Erickson (Associated Press 2000), an opponent of the Yucca Mountain repository, states “The Great Basin has often been perceived as a vast, useless wasteland. We’ve opened the door for these kinds of projects, and we’re finding it’s getting pretty hard to close it”.

### *The Skull Valley PFS site*

The term wasteland also circulates within the Skull Valley PFS HLW siting controversy. The Skull Valley Band of Goshute Reservation is located on land widely considered to be a wasteland. Skull Valley is a typical desert southwest landscape. In *Roughing It*, Twain (1913) called the region a wasteland. He wrote (p. 127): “imagine a vast, waveless ocean stricken dead and turned to ashes; imagine this solemn waste tufted with ash-dusted sage-bushes. . . . This is the reality of it”. Since then, Skull Valley has arguably become a literal wasteland. Land to the east, north, and south of reservation has been used for chemical and biological weapons development and testing, a nerve gas storage facility, a coal-fired electrical power plant that causes air pollution, a low-level radioactive disposal site, two hazardous waste incinerators, one hazardous waste landfill, and a magnesium plant identified by EPA as the most polluting plant of its kind in the United States. Speaking specifically of the surrounding Tooele county, Davis (1998) calls it “the nation’s greatest concentration of hyper-hazardous and ultra-deadly materials” (p. 35). Further, Rupert Steele (as cited in Mims 2000), tribal vice-chairman of The Consolidated Tribes of the Goshute Reservation notes, “We all know that land [surrounding the Skull Valley Reservation] has been a dumping area for a long time, a wasteland”.

In his advocacy of the Skull Valley PFS HLW storage proposal, former Skull Valley Band of Goshute Chairperson Leon Bear used the perception of the land as wasteland to justify the proposal.<sup>12</sup> Bear (as cited in Kasindorf 2002) openly referred to his reservation as “a wasteland – a beautiful wasteland”. He reasoned that since the reservation is already both symbolically and literally a wasteland, the Skull Valley Band of Goshute should make money from storing another form of waste – nuclear waste. According to Bear (as cited in Isrealson 2002), “The [county] has designated [parts of Tooele County] as an industrial waste zone. We’ve found something that fits in with that designation”. According to a statement on the now defunct Skull Valley Band of Goshute web site (as cited in Earth Journal Online Connections 2007),

In view of the current hazardous waste facilities and nerve gas incinerators surrounding the Skull Valley reservation, the band has carefully considered a variety of economic ventures, including the storage of spent nuclear fuel. After careful consideration, the Skull Valley Band of Goshutes have leased land to a private group of electrical utilities for the temporary storage of 40,000 metric tons of spent nuclear fuel.

Leon Bear and other proponents argued that HLW storage would be the best way to promote economic development in an area already considered to be a “wasteland” (Johnson 2005). Indeed, these features have perhaps also prevented the fruition of alternate economic

development projects for the Skull Valley Band of Goshute Indians. The Tekoi Balefill landfill for municipal waste, leased on the southwest corner of the reservation, is the only current source of economic development on the Skull Valley Band of Goshute (Margene Bullcreek, personal communication, 18 April 2009).

Because the Skull Valley Band of Goshute government supported the PFS temporary waste site, it could be suggested that the Skull Valley PFS siting controversy is not an issue of environmental justice. Indeed, Krakoff (2002, p. 163) argues, “Environmental Justice for tribes must be consistent with the promotion of tribal self-governance”. If the Skull Valley Band of Goshute government pursued the HLW site, the reasoning goes, it did so in exercise of its sovereign right to do so (as opposed to being coerced into it). However, a closer look reveals two ways in which the Skull Valley PFS HLW site is an issue of environmental injustice. First, the site was opposed by a large portion of the Skull Valley Band of Goshute. The opponents fought against a policy of their own government that they felt was violated the principles of environmental justice. Margene Bullcreek and Sammy Blackbear are two of the most vocal opponents of the HLW site. Bullcreek (as cited in LaDuke 1999, p. 105) argues that it is an environmentally unjust policy “that will damage our plant life, water, air, and spiritual atmosphere as well as future generations”. Marginalised members of the Skull Valley Band of Goshutes accused Leon Bear and the government of corruption. Opponents state that they never got to vote on the proposal and that Bear signed the lease with PFS in secret (Spangler 2005). Bullcreek and Blackbear charged that Leon only shared financial resources from the PFS proposal with proponents of the site and denied resources and services to dissidents (Fahys 2002, 2003). In corroboration of the accusations of corruption, Bear was put on probation for tax fraud charges that emerged from a leadership corruption case (Fahys 2005). Three additional Skull Valley Band of Goshute government officials also pleaded guilty of using tribal funds for illegal purposes (Fahys 2005). In the midst of this the PFS controversy, Leon Bear cancelled four elections for new government executive council members; Bear claimed it was due to lack of quorum, but opponents claimed that it was to prevent opponents to the PFS proposal from being elected (Fahys 2005). The Bureau of Indian Affairs stepped in and ran an election in 2006, in which Lawrence Bear was elected as the new Chairperson (Henetz 2006a, 2006b). Because Leon Bear and the governing council violated the law and the rights of other members of the Skull Valley Band of Goshute to participate in benefit from the decision to store HLW on the reservation, the governing council’s actions violate the principles of environmental justice.<sup>13</sup>

Second, opponents claim that the Skull Valley PFS proposal is part of the broader system of environmental injustices against Native Americans, particularly nuclear colonialism. Margene Bullcreek argues that PFS targeted the Skull Valley Band of Goshute because of their economic despair. She states,

And so environmental justice comes in when we have something like the PFS coming in to disrupt our way of life and effects that it’s going to have on us if there was going to be any type of mishap from this waste storage. . . . It’s a small community usually – usually a small community that has to deal with this large corporation. And the large corporation does not consider the way of livelihood that we have as indigenous people. They’re just out for – to have gains for their own purposes.<sup>14</sup>

Native American environmental organisations (i.e. Honor the Earth, Indigenous Environmental Network, and NECONA) also labelled the Skull Valley PFS proposal as an environmental injustice stemming from the system of nuclear colonialism. The Indigenous Environmental Network (2002) states that the PFS proposal is a “form of economic

blackmail and corporate oppression on a small indigenous community” that has already suffered “decades of toxic exposures from Department of Defense experiments with toxic and biological warfare and failed United States governmental policies that have created poverty and high unemployment among the Skull Valley Goshute”. In other words, colonialism left the Skull Valley with few options but to accept the Skull Valley proposal to pursue economic development. Further, Bullcreek (as cited in Fahys 2002, p. 2) states, “They are waving this like it’s economic development, like it’s a really good deal, when it has poisoned us, when it has killed our natural awareness. Everybody is going to say ‘we don’t want this’ later. But it is going to be too late”. Ishiyama (2003) suggests that the Skull Valley case is a complex example of environmental injustice that intersects with sovereignty and a history of colonialism and economic depression on the Skull Valley reservation. Whether one sides with the Skull Valley Band of Goshute leaders that approved the PFS lease or the opponents, the PFS site still fits within the general pattern of HLW storage being considered primarily on Native American land.

Members of the Skull Valley Band of Goshute attempted two ways of resistance to the “wasteland” label: appropriation and rejection. In an appropriation of the wasteland term, the Skull Valley Band of Goshute government accepted the label of wasteland in an attempt to promote economic development. Foucault (1982) would term this an act of self-subjectification, when the subject has internalised a label imposed upon it. On the other hand, opponents rejected that reasoning. Margene Bullcreek states, “Well, Mr. Bear always said, well we’re in the center of the five hazardous wastes of Utah. So, why not have one more? I mean, yeah. But we can’t help our surroundings of it, but we could be able to help storing the waste here, which is the worst of everything”.<sup>15</sup> Moreover, Bullcreek (personal communication 18 April 2009), while acknowledging the wasteland label, denies that her reservation is a wasteland; she describes her fight against the Skull Valley PFS site as a struggle to protect her homeland from becoming a wasteland.

The Skull Valley PFS proposal reveals a complex dynamic of resistances to the naming of their reservation as a wasteland and more broadly to the nuclear colonialism discursive formation. Foucault (1978, p. 220) wrote,

a power relationship can only be articulated on the basis of two elements which are each indispensable if it is really to be a power relationship that ‘the other’ (the one over whom power is exercised) be thoroughly recognized and maintained to the very end as a person who acts; and that, faced with a relationship of power, a whole field of responses reactions, results, and possible inventions may open up.

In other words, the diverse responses of the Skull Valley Band of Goshutes represent the field of possibilities enabled by an act of power, in this case the wasteland discourse.

Wasteland circulates through discourse about certain regions of the United States and our discourse about nuclear colonialism. The rhetorical construction of the desert southwest region as a wasteland describes a remote, lifeless, ugly, barren, uninhabitable, and spiritually vacant place, which I have shown above is not the case. The act of rhetorically naming the place as a wasteland has consequences for the region: (1) the wasteland label for the American southwest has influenced its becoming an actual wasteland, and (2) the two HLW storage sites that received the most consideration – Yucca Mountain and Skull Valley – are justified in part because they are in a wasteland. Moreover, advocating for a nuclear waste site in an area already labelled a wasteland can mask the injustice of the siting decision, especially if the site is also presented as being in the national interest

(Endres 2009). However, as the case study demonstrates, there is resistive potential in the wasteland, illustrating Foucault's (1972, p. 67) point that

A discursive formation does not occupy therefore all the possible volume that is opened up to it of right by the systems of formation of its objects, its enunciations, and its concepts; it is essentially incomplete, owing to the system of formation of its strategic choices. Hence, the fact that, taken up again, placed, and interpreted in a new constellation, a given discursive formation may reveal new possibilities.

The analysis of discourse can reveal both the underlying assumptions that allow for injustices to occur and the potential avenues of resistance to such assumptions.

### Conclusion

Discourse is not the only factor in environmental injustices, but it plays an important role that must be considered. This essay has examined the importance of discursive formations in the perpetuation and justification of nuclear colonialism, a particular type of environmental injustice. In other words, my analysis reveals that a term like wasteland not only reflects deep-seated values of what makes land and nature useful to the dominant White European-American culture in the United States, but also demonstrates that once a place is named a wasteland, it justifies the use of such land for waste. Regions that are named wastelands can become literal wastelands through policies that leave or site toxic waste on the land. This discussion of the wasteland term also has implications beyond nuclear colonialism. The wasteland term may be employed to other regions of the country that have already hosted a variety of toxic waste sites (e.g. Cancer Alley). Or the term may be used to justify toxic waste sites in various regions. The wasteland term is highly problematic because it could potentially set in motion a chain of events that turn a region into a literal wasteland, full of toxic waste sites. Further research to examine how the term wasteland is employed in other environmental struggles is warranted.

The dispersed and productive nature of discourse allows for multiple possibilities for using discourse to resist. In addition to my analysis of how members of the Skull Valley Band of Goshute play with the wasteland term, there are other possibilities for resistance. For example, activists have taken up the term "national sacrifice zone" as a way to expose the relationship that marginalised communities have to toxic sites, like wastelands (Grinde and Johansen 1995, Davis 1998, Kuletz 1998, Bullard and Johnson 2000). Using the term national sacrifice zone calls forth the sacrifices that marginalised people living in the sacrifice zone must make and challenges the existence of these zones.

The second purpose of this essay was to discuss the environmental injustices related to nuclear power. In addition to the siting practices of nuclear power plants, the oft-forgotten aspects of the nuclear production cycle – Uranium mining and HLW siting – also demonstrate environmental injustices. Looking only at the siting practices of nuclear power plants, one could argue that they are less problematic than coal power plants, for example, that emit more air pollutants that affect local communities. However, through the analysis of the vast environmental injustices of Uranium mining and HLW siting, we see the full picture of nuclear power from an environmental justice framework. In order to make decisions about which energy sources are the most just and good for the environment, there are many factors to be considered. Analysis of the environmental justice implications of all of the potential energy sources is an essential component of pursuing just energy policies. This essay contributes with its analysis of nuclear power from an environmental justice framework.



## Notes

1. The term “radioactive colonisation” was first introduced by Churchill and LaDuke (1993). I am aware of the rulings of plagiarism and academic misconduct against Ward Churchill. After closely reading the report from U.C. Boulder (Report 2006), I found that Churchill’s work on radioactive colonisation is not indicted in the report. Although Churchill was the first to introduce the term “radioactive colonisation”, much subsequent independent research has substantiated the phenomenon (e.g. Makhijani *et al.* 1995, Kuletz 1998, Hooks and Smith 2004).
2. Climate justice is related to, and often interconnected with, energy justice but will not be the focus of this essay (for more on climate justice, see International Climate Justice Network 2002, Bullard *et al.* 2005).
3. Indigenous are not the only marginalised groups harmed or targeted by nuclear technologies. Bullard and Johnson (2000) describe how Citizens Against Nuclear Trash (CANT) in Claiborne Parish Louisiana successfully fought a proposed Uranium enrichment plant.
4. Resource colonialism depends on denying land ownership rights and sovereignty of the colonised. As such, it also relies on the country’s legal and political system to limit the rights of the colonised. In the USA, this means drawing on the domestic dependent relationship and the trust relationship that holds Native American lands and monies in “trust” through the Bureau of Indian Affairs (Wilkinson 1991).
5. In 2007, the Navajo nation succeeded in persuading federal government to clean up the Church Rock site, which contaminated the water and soil near Navajo homes with radiation for 24 years (Navajo Nation 2007).
6. The nuclear fuel cycle also produces other classifications of radioactive waste including Uranium mill tailings and low-level waste (US Nuclear Regulatory Commission 2009).
7. “Treaty between the United States of America and the Western Bands of Shoshone Indians”, 1 October 1863, 18 Stat. 689-92. The Western Shoshone case is bolstered by two U.N. commission rulings that conclude that the U.S. claim to lands in the 1863 treaty is illegal and violates international human rights law (UN Inter-American Commission on Human Rights 2002, UN Committee for the Elimination of Racial Discrimination 2006).
8. PFS and the Skull Valley government are at the time of writing suing the federal government to reverse the rulings (Fattah and Struglinski 2007).
9. It is important to note that despite the value of the land, we must be cautious of essentialising Native Americans as fundamentally ecological and environmentalist. First, although there are some similarities in religion and culture across Native Americans, there are over 150 distinct Native American nations in the USA. Second, as is true with any culture, there are differences between cultural beliefs and practices. In other words, despite cultural beliefs that value and encourage sustainable relationships with nature and the land, not all Native American nations put these beliefs into practice. Third, there is evidence that some ancient and contemporary indigenous people have been responsible for environmental degradation and harm, in some cases leading to abandonment of the land (e.g. Kretch 1999, Diamond 2004). A scholarly debate has emerged over these issues (e.g. Martin 1978, Weaver 1996, Kretch 1999, 2005, Forbes 2001, Nelson 2006, Johnson 2007).
10. Although influential, American perceptions of the desert are much more complicated than Fremont’s description of it as a wasteland. There are varied perceptions of the desert as beautiful, sacred, and blessed (McPhee 1981, Limerick 1985, Worster 1985, Williams 1991, Beck 2001).
11. For more discussion of deserts in America, see Beck (2001), McPhee (1981), Limerick (1985), and Worster (1985).
12. Leon Bear was the tribal chair when the Skull Valley Band of Goshute Executive Council signed a lease with PFS for temporary HLW storage on the reservation. In 2006, Leon’s uncle Lawrence Bear was elected to be the Chairperson.
13. Leon Bear maintains that a majority of the Band supported the proposal and that he did not perpetrate an environmental justice. On the contrary, he argues that the State of Utah’s opposition to the site is environmental racism.
14. Nuclear Technology in the American West Oral History Project, University of Utah J. Willard Marriott Library Special Collections, Everett L. Cooley Collection, Tape u-1865.
15. Nuclear Technology in the American West Oral History Project, University of Utah J. Willard Marriott Library Special Collections, Everett L. Cooley Collection, Tape u-1864.

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