Reaching Critical Mass: The Rise of Grassroots Groups and the Politics of Nuclear Accountability

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Abstract

This dissertation examines the factors that contributed to the opening of the Department of Energy's (DOE) nuclear weapons complex to environmental regulation and public participation and assesses the implications of shifts in regulatory politics for democratic governance. While acknowledging the importance and role of elite actors, this research places community-based grassroots groups at the center of analysis to contribute a better understanding of how a multidimensional regulatory framework structures interactions between communities, states and the federal government. It also evaluates opportunities for public participation in policy and decision-making processes at the federal, state and local level. While some scholars have bemoaned the decay of American politics and a decline in democratic participation, this study finds there is in fact sustained and informed grassroots participation in regulatory decision and policymaking processes. Even if it falls short of participatory ideals, communities are demanding a say in regulatory politics, and not just relegating decisions to administrators, contractors, experts, or national interest groups.

This research is based on analysis of hundreds of Congressional records, government documents, and news articles; materials produced by community-based grassroots groups; and interviews with government officials, and with leaders and staff of community-based grassroots organizations. This research concludes that even in a policy area as scientifically and technologically complex as environmental remediation of the nuclear weapons complex, community-based grassroots organizations have made significant contributions to the regulatory process by developing expertise, monitoring and participating in environmental remediation and waste management processes, advocating greater public involvement opportunities and mobilizing public participation. This research also finds that when community-based grassroots groups and the public are involved early and continuously in regulatory processes, there are better policy outcomes and decisions reached have greater legitimacy.

For Ben, Ever and Cade.

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Acronyms

ANA – Alliance for Nuclear Accountability
AEA – Atomic Energy Act
AEC – Atomic Energy Commission
CCNS – Concerned Citizens for Nuclear Safety
CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act of 1980, a.k.a. Superfund
CO – Consent Order between Department of Energy and New Mexico governing cleanup
CPRA – California Public Records Act
DAD – Decide Announce Defend
DFNSB – Defense Nuclear Facilities Safety Board
DOE – Department of Energy
EEIOCPA – Energy Employees Occupational Illness Compensation Program Act of 2000
EIA – Environmental Impact Assessment under the National Environmental Policy Act
EIS – Environmental Impact Statement
EM – Office of Environmental Management at DOE
EPA – Environmental Protection Agency
ERDA – Energy Research and Development Administration
FBI – Federal Bureau of Investigation
FFA – Federal Facilities Agreement
FFCA – Federal Facilities Compliance Act of 1992
FRESH – Fernald Residents for Environmental Health and Safety
FOIA – Freedom of Information Act
GAO – General Accounting Office, later renamed Government Accountability Office
HEAL – Hanford Education Action League
HLW – High Level Waste
HSW – Hazardous and Solid Waste Amendments of 1984
INEL – Idaho National Engineering Laboratory
LANL – Los Alamos National Laboratory
LLNL – Lawrence Livermore National Laboratory
LLW – Low-level waste
MESH – Miamisburg Environmental Safety and Health
MPN – Military Production Network
NNSA – National Nuclear Security Administration, a department within DOE
NMED – New Mexico Environment Department
NRC – Nuclear Regulatory Commission
NRDC – Natural Resources Defense Council
NEPA – National Environmental Policy Act of 1970
NPL – EPA's National Priorities list of Superfund Sites
NWPA – Nuclear Waste Policy Act of 1982
OREPA – Oak Ridge Environmental Peace Alliance
RCRA – Resource Conservation and Recovery Act of 1976
RECA – Radiation Exposure Compensation Act
RMPJC – Rocky Mountain Peace and Justice Center
SIS – Special Isotope Separator

SNF – Spent Nuclear Fuel
SNL – Sandia National Laboratory
SRA – Snake River Alliance
SRIC – Southwest Research and Information Center
SRS – Savannah River Site
Tri-Valley CAREs – Tri-Valley Communities Against a Radioactive Environment
TRU – Transuranic waste
WIPP – Waste Isolation Pilot Plant
WIPP LWA – Waste Isolation Pilot Plant Land Withdrawal Act of 1990
WPPSS – Washington Public Power Supply System

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Chapter One: Introduction

"I know of no safe repository of the ultimate powers of society but the people themselves and if we think them not enlightened enough to exercise their control with a wholesome discretion, the answer is not to take it from them, but to inform their discretion."
Thomas Jefferson

"Fighting the good fight for all of us was getting correct data and information to the community, involving our community in what I call the good fight, encouraging people to come and participate, to come to the meetings and ask questions, and offer public comment, really getting people engaged and involved in this issue. Because seven women can't fight the fight for everybody. That was a huge success for us."
Lisa Crawford, Fernald Residents for Environmental Safety and Health

"It was their investment, day after day, and our public meetings and reading our reports and cutting through them, and interacting with us as we went along and then reporting to the community at large that changed it."[1]
Dennis Carr, Former Fernald Site Deputy

On June 28, 1941, President Franklin D. Roosevelt issued Executive Order 8807 and, in so doing, secretly authorized committees that would begin to research and develop technology to produce the nation's first nuclear weapons.[2] By 1945, the U.S. Army Corps of Engineers Manhattan Engineer District, or the Manhattan Project, successfully developed and detonated three nuclear weapons. The first nuclear weapon was detonated on July 16, 1945 at the Trinity Test Site near Alamogordo, New Mexico. On August 6, 1945, the United States detonated a bomb with an enriched uranium core with an explosive force of some 12,500 tons of TNT over the Japanese city of Hiroshima, immediately killing between 70,000 and 90,000 people; the total would reach 145,000 by the end of 1945. On August 9, 1945, the U.S. detonated a bomb with a plutonium core and an explosive force of some 22,000 tons of TNT over the Japanese city of Nagasaki,

[1] Quoted from "Roadmap to Resolution: Communities, Government and Corporations Solving
[2] Franklin D. Roosevelt: "Executive Order 8807 Establishing the Office of Scientific Research and Development," June 28, 1941. Online by Gerhard Peters and John T. Woolley, *The American Presidency Project*. http://www.presidency.ucsb.edu/ws/?pid=16137.

killing some 40,000 people immediately and an additional 35,000 over the next few months. Tens of thousands more Japanese civilians suffered serious injuries.[3] The United States' development and use of nuclear weapons heralded a Nuclear Age that significantly impacted the world's political and environmental landscape.

In 1946, Congress enacted the Atomic Energy Act, transferring nuclear weapons development and production from the Manhattan Engineering District to the newly created Atomic Energy Commission (AEC).[4] The U.S. maintained a monopoly on nuclear weapons until the Soviet Union conducted its first nuclear test in 1949. The Soviet test propelled America's nuclear program and, in 1950, President Harry Truman ordered the AEC to develop a hydrogen bomb, which would have a much greater explosive yield than the fission bombs needed to trigger it. In addition, largely in response to the Korean War, Congress authorized a massive expansion of the production of plutonium and highly enriched uranium in the early 1950s, which led to the development of a nation-wide network for the design, research, development, testing and production of nuclear weapons.[5] The result, the so-called nuclear weapons complex, included dozens of industrial facilities, mines, laboratories and testing sites across the country that have produced more than 70,000 weapons used to defend the nation and win the Cold War.

Over half a century of nuclear weapons research, design, development and production left a costly and intractable legacy of environmental contamination. Environmental remediation and management of the legacy waste across the nuclear

[3] Frank Barnaby, "The Continuing Body Count at Hiroshima and Nagasaki," Bulletin of Atomic Scientists, December 1977, 51.
[4] U.S. Congress, Atomic Energy Act of 1946 (60 Stat. 755), August 1, 1946.
[5] Alice Buck, "The Atomic Energy Commission," U.S. Department of Energy, Office of History and Heritage Resources, July 1983, 3-4, http://energy.gov/sites/prod/files/AEC%20History.pdf.

complex is an enormous job that affects most American states, yet it is rarely publicized and receives scant attention in the national policy arena.[6] The Department of Energy (DOE), through its Office of Environmental Management (EM), is responsible for remediation and stewardship sites across the country contaminated with radioactive and chemical wastes.[7] According to former DOE Deputy Assistant Secretary for Regulatory Compliance Frank Marcinowski and EM, it is the largest environmental "cleanup" program in the world.[8] As of this writing, DOE has active remediation efforts across eleven states (California, Idaho, Illinois, Kentucky, Nevada, New Mexico, New York, Ohio, South Carolina, Tennessee, Utah, and Washington).

Because the nuclear complex was established by the federal government during World War II and expanded during the Cold War, the public, the states and even Congress, were traditionally excluded from decisions regarding defense nuclear activities, and many, if not most activities were concealed. Nuclear weapons issues, even those related to the environment, health and safety, were defined and framed under the rubric of "national security," thereby limiting the number of decision-makers in the program. As a result, the federal agencies responsible for overseeing the operations of the nuclear weapons complex – first the Army Corps of Engineers, then the Atomic Energy Commission, then the Energy Research and Development Administration and currently

[6] To the best extent possible throughout this dissertation, I employ the terms "environmental remediation" and "waste management." Occasionally, I employ the shorthand term "cleanup," for example when it has been used by interviewees or in documents. It is especially important to note, however, that the term "cleanup" is a mischaracterization since radioactive waste can't really be cleaned up, attempts can only be made to contain and manage it.

[7] As of November 2015, the Office of Environmental Management states there are 107 sites in the nuclear weapons complex with active or planned remediation efforts and it claims completed remediation at 90 sites.

[8] Statement of Frank Marcinowski, Deputy Assistant Secretary for Regulatory Compliance, Office of Environmental Management, U.S. Department of Energy, Before the Committee on Environment and Public Works, U.S. Senate, September 18, 2008.

the DOE – were historically secretive, largely self-regulating and insulated from public, Congressional and media scrutiny. DOE and its predecessor agencies used the "national security" justification to claim "sovereign immunity" from environmental, health and safety oversight and regulation. In addition, because the scientific and technological complexity related to nuclear weapons research, development and production, only a small group of experts were considered qualified enough to participate in decisions, which also contributed to limiting the number of decision-makers and insulting the DOE and its predecessor agencies from external oversight and regulation.

From the inception of secretly authorized committees in 1941 until the late 1980s and early 1990s, DOE and its predecessor agencies maintained a policy monopoly over all aspects of the nuclear weapons program. Yet, the political void surrounding the nuclear weapons complex that persisted until the end of the Cold War stands in stark contrast to the situation today in which nuclear weapons sites are subject to regulation under state and federal environmental and health laws, and decisions with regards to addressing the environmental legacy are open to public participation. Indeed, according to the DOE's Office of Environmental Management, it is very important for the agency's institutional legitimacy to solicit and receive input from the public and from the community-based organizations representing the public prior to making decisions regarding environmental remediation and waste management activities at nuclear weapons sites because such decisions have the potential to affect the health of the public, the environment, and future resource use by the public for generations. According to public statements, the DOE also seeks to foster public confidence that decisions regarding environmental remediation and waste management activities reflect public

input regarding maximum reasonable exposure scenarios and that decisions address public expectations for use of resources affected by contamination at DOE sites. Furthermore, according to the DOE, input from affected communities can improve DOE-EM decisions by ensuring that local conditions are better understood and incorporated into decisions.[9]

How did such a dramatic shift on a national security issue from secrecy, insulation and self-regulation to external regulation by federal and state agencies and the opening to public participation on health and environmental matters occur? Is this shift as significant as it might seem? How has it affected policy outcomes? How does it relate to regulatory politics and democratic governance in the United States?

Three factors contributed to the opening of the decision and policy-making processes regarding health, safety and environmental issues at defense nuclear facilities. First, the effects of macropolitical trends in American regulatory politics deserve attention. In particular, the "new social" and environmental regulation regime that originated in the 1960s and 1970s played a critical role in opening up regulatory decision making to public participation.[10] The regulatory regime shifted from one that was administrative-centered and relied on managerial expertise to one that sought to enhance public participation in administrative processes. Before the emergence of the "new social regulation" in the 1970s, there was virtually no public participation in the traditional regulatory process. In addition, the environmental movement included a series of environmental laws passed by Congress in the 1960s and 1970s, and amended in the

[9] Department of Energy, "Public participation and community relations," DOE Policy document (Washington, DC: Office of Congressional and Intergovernmental Affairs, Department of Energy), May 2, 2003.
[10] Sidney M. Milkis and Richard A. Harris, *The Politics of Regulatory Change: A Tale of Two Agencies* (New York: Oxford University Press, 1989), 4-5.

1980s, that paved the way both for greater regulation by federal and state entities to oversee federal activities affecting the environment and for greater public participation.

While these macropolitical trends made possible the idea that federal facilities should be subject to health and environmental regulation in the same way as commercial entities and that the public should be involved in regulatory processes, the government's nuclear weapons industry was insulated from the wave of reform until the late 1980s. Thus, the reforms of the new social and environmental regime alone cannot explain why health, safety and environmental concerns of nuclear weapons programs became subject to regulation and public participation when it did. Two other conditions were also necessary. First, internal factors at DOE played a role, especially revelations in the 1980s that the nuclear weapons complex infrastructure was crumbling and that there were extensive environmental pollution, health and safety problems. Second, external factors, in particular the end of the Cold War and the change in the international context allowed domestic actors to redefine nuclear weapons issues from "national security" and elevate public consciousness of the negative environmental, health and safety legacy. By the late 1980s, national security could no longer be used to trump the public interest. DOE was subject for the first time to intense media and public scrutiny and Congressional inquiry. As more information became available, DOE could no longer insulate itself from criticism and the revelations showed that the DOE could not be trusted to regulate itself or act in the interests of the public. A movement for openness, accountability, and health and environmental justice mobilized to challenge and change DOE policies and practices. Once DOE became subject to regulation under federal and state environmental laws, policy and decision-making processes were opened to other actors, including the

Environmental Protection Agency, Health and Human Services, state environmental and health agencies, and the public.

How regulation and openness came to the nuclear weapons complex is of special interest compared to other issue areas because the stakes are high, the scientific and technological issues are complex and secrecy makes regulation a challenge. Perhaps most importantly, this case shows that public participation can provide a meaningful role in regulatory politics, even on an issue as scientifically and technologically complex as nuclear weapons. This case is also of special interest because it concerns regulation of a government industry, rather than a commercial industry, and therefore it raises questions about the ability of the government to regulate itself. It is also of special interest because it concerns an issue area in which conservatives, traditionally strong proponents of federalism, have favored expansive federal power and limits to states' authority. Meanwhile, liberals, traditionally proponents for expanded federal power, have advocated limits to federal power and an expansion of states' rights. Furthermore, while policy and decision-making processes are far more open today than they were prior to the 1990s, they are not a level playing field that scholars have found in other issue areas.[11] By focusing on one policy area, I can show changes over a substantial period of time, the importance of substantive policy information and the role of community groups and other actors in bolstering the regulatory process.[12]

This research is especially interested in the micropolitics of regulation and the expansion of actors in the regulatory process. While other research has focused on

[11] See for example: Christopher J. Bosso, *Pesticides and Politics: The Life Cycle of a Public Issue* (Pittsburgh, PA: University of Pittsburgh Press, 1987).
[12] Paul A. Sabatier, **"**Toward Better Theories of the Policy Process," *PS: Political Science & Politics*, Volume 24, Issue 02, June 1991, p. 147-156.

broader regulatory trends and the role of elite actors, this research adds a better understanding of the role that community-based grassroots groups, which typically did not have any formal power in the regulatory process, can play in regulatory politics. I argue that community-based grassroots organizations are the primary actors representing communities affected in policy and decision-making processes. Their participation in regulatory politics helps to ensure that the government is responsive to public concerns in this complex and high-risk policy area. Absent ongoing Congressional and media scrutiny, grassroots organizations are the primary actors pressing for the best interests of the public to be incorporated into decisions that affect the environment, health and safety of communities they represent. Furthermore, because local, state and federal regulatory agencies often lack resources, it is community groups that engage in ongoing oversight and bring attention to critical issues. In addition, grassroots groups have pressured local, state and federal regulators to take stronger positions to protect the environment and health and safety of the public. Finally, because of the complexity of issues, these groups play an important role in educating and mobilizing the public.

Reaching Critical Mass: the role of community-based organizations

As a result of the Department of Energy's failure to regulate itself and effectively address the environmental and health legacy of nuclear weapons development, testing and production, I examine how community-based grassroots groups, came to be involved in the regulation and remediation of defense nuclear facilities. While legislation passed by Congress in the 1960s and 1970s paved the way for public participation in environmental policy-making, grassroots and community groups around nuclear weapons sites mobilized in the 1980s and developed expertise to make decision and policymaking

processes more transparent, inclusive and democratic. In particular, these groups have played a critical role in educating and engaging the public in the process of environmental remediation and waste management policy decisions, and in pressing for greater authority for states.

To be clear, this study does not examine the role of national interest groups. Instead, I focus on community-based groups working around specific sites in the nuclear weapons complex. The reasons are two-fold. First, I view the work of these community-based groups as significant, but largely overlooked. These community-based groups are also part of a larger movement in the United States to "redemocratize" the political system by calling for greater public engagement in the political process to solve environmental problems. They are also part of a larger trend towards local activism since the 1960s and 1970s in response to significant decline in public confidence in government. As Cable and Cable note:

> Since the 1960s, an emerging feature of the American political landscape has been the proliferation of a variety of community-based grassroots organizations designed to bring about a more just and democratic political system for their constituencies through their influence on local political conditions and structures. Together, these grassroots organizations may be viewed as part of a broader social movement whose general goal is 'redemocratizing the United States political system.'"[13]

Second, studies of large national interest groups have shown the tendency toward what Theodore Lowi described as "interest group liberalism," in which powerful interest groups have the resources to lobby agencies and Congress.[14] This makes Congress and agencies more likely to support and respond to the policy demands of powerful interest

[13] Sherry Cable and Charles Cable, Environmental Problems, Grassroots Solutions: The Politics of Grassroots Environmental Conflict," (New York: St. Martin's Press, 1995), p. 117.
[14] Theodore J. Lowi, *The End of Liberalism: The Second Republic of the United States*, Second Edition (New York: W.W. Norton and Company, 1979).

groups, rather than persons or groups who do not possess significant political power or financial resources. Yet, this study found that there have indeed been instances when Congress and federal agencies responded to the interests of local communities, even though they are under-resourced and have less access to political processes.

This study also found that there is a tension between national and community-based organizations. In particular, national groups may seek to limit the range of policy outcomes they advocate to what they think is politically possible so as not to expend political capital or undermine their access to decision-makers. On the other hand, grassroots community organizations tend to push for greater demands that meet the needs of the communities they represent. In addition, national interest groups may not seek to directly involve the public in decision-making processes, but instead conduct meetings with agency officials or Congress away from public view. In contrast, grassroots community organizations are intent on including and educating the public in decision and policy-making processes. Grassroots community organizations have also made an important contribution by working with state and local regulators and officials, whereas national organizations are primarily focused on national institutions.

In addition, powerful national interest groups working on environmental policy may think that their objectives or policy demands serve the public interest, but their policy demands may in fact conflict with the desires of a local community. For example, I found that local organizations around the Fernald nuclear site in Ohio specifically told national groups, including Sierra Club and Greenpeace, that they did not want them involved in the site's remediation and waste management decisions.[15] In particular, the Fernald groups were concerned that national groups would hijack the process to press for

[15] Interviews with author.

their own agenda, rather than focus on the concerns of the community. The Fernald groups believed that the decisions about what to do with the site's wastes should reflect the community's desires. The Fernald groups were also concerned that the national groups would use the decision-making processes to focus on broader issues of nuclear weapons disarmament, which would politicize the health and environmental concerns, marginalize workers at the site with whom local groups had formed political alliances, and make community consensus on site decisions more difficult to achieve.

Thus, this dissertation seeks to highlight the role of community-based groups whose goal is to educate and engage publics who are directly affected by the health and environmental legacy of the nuclear weapons complex. I examine the rise of organizations working around nuclear sites, the reasons these organizations were formed, the activities they engage in to educate and mobilize citizens, and their role in the policymaking process. Most importantly, I examine how these organizations and communities use the political process and interact with federal, state and local officials to remediate nuclear sites and surrounding communities and to address threats to public and worker health. I discuss the work of members of the Alliance for Nuclear Accountability, a well-established network of 36 local, regional and national organizations each representing the concerns of communities living near U.S. nuclear weapons sites and radioactive waste dumps.

The Military Production Network, later renamed the Alliance for Nuclear Accountability (ANA), was founded in the 1980s as grassroots community and public interest organizations concerned about the toxic environmental and health legacy of nuclear weapons facilities in their backyard realized that to affect real change, they would

need to address the nuclear weapons complex as a whole. Many groups had been working largely in isolation at individual facilities, with few resources to challenge federal agency policies and practices. In 1987, a movement of these grassroots organizations coalesced to form a network to counter the historic secrecy and self-regulation at DOE and its predecessor agencies, arguing that such practices are not tolerable in a free and democratic society.

As they organized, leaders of community-based groups began to realize that the Department of Energy was telling each of the communities around nuclear sites something different about site remediation and waste management, safety and environmental concerns. For example, the DOE would simply shuffle waste from one site to another and then declare a site "cleaned up." Once organizations in different communities began coordinating information, they were able to more effectively ask the right questions in meetings with regulators and to hold the DOE accountable. As a result, when DOE officials traveled to nuclear sites, network member organizations would attend their meetings and share information with other member groups. ANA developed principles for environmental remediation and waste management and involved communities directly affected by activities at nuclear complex sites. One of the real successes as a result of the founding of ANA and the increased ability of organizations and communities to share information was that it forced the DOE to establish more transparent and coherent environmental remediation and waste management strategies.[16] ANA also contributed to policy change at DOE to include the public in the decision-making processes with regards to environmental remediation and waste management.

[16] Susan Gordon, Interview with Author, June 12, 2014.

This study offers several lessons from the organizations and community members who have been involved in health, safety and environmental remediation issues. Community-based groups have played an important role in pushing for public participation in these processes and they have educated themselves and the public about complex policy and political processes, and technical issues. Perhaps one of the most important lessons is that individuals can develop the technical knowledge and expertise to make informed policy decisions. This finding is contrary to previous beliefs that citizens are not knowledgeable enough to participate in policy and decision-making processes. For example, Mary M. Timney writes, "In many cases, communication is a one-way street from administrator to citizens. The basic assumption of many public administrators is that citizens have, at best, marginal expertise, not essential information, and thus are best left out of the process until the important decisions have been made and they can do little damage."[17] Indeed, one U.S. EPA administrator told me that when he began working on remediation at a site, he was told that he needed to engage the public in the decision-making process. However, he was worried that public engagement would slow projects down. By working with the community, he changed his view to support greater public participation, believing that it was important to the long-term success of remediation projects because there were tough decisions to be made and the community had a stake in those decisions.[18]

In addition, drawing on "fire alarm" theory, I argue that an especially important function of community groups is watchdogging agencies and contractors to ensure the

[17] Mary M. Timney, "Overcoming Administrative Barriers to Citizen Participation: Citizens as Partners, not Adversaries," In *Government Is Us: Public Administration in an Anti-Government Era*, edited by Cheryl Simrell King and Camilla Strivers, 88-101 (Thousand Oaks, CA: Sage Publications, 1998), p. 98.
[18] Interview with author.

implementation of decisions based on agreements and monitoring environmental and health issues around defense nuclear sites.[19] Because regulatory agencies are spread thin due to budgetary and staff shortfalls, they can't always effectively oversee DOE and its contractors. Thus, community-based groups working around sites can provide important information and sound the alarm to regulators and Congress when health or environmental issues are discovered or when DOE or its contractors do not do what they agreed. These groups educate and mobilize the public on these issues. They also play an important role in garnering support for consensus policy decisions, even if they do not always get what they want. These groups advocate for adoption of higher standards to benefit the environment and health of the communities surrounding nuclear sites.

Another lesson learned is that early public and community participation in policy and decision-making processes can serve as a means for combatting policy gridlock. Historically, the regulatory process has only allowed limited public input in decisions in what has been referred to as the "decide-announce-defend" model. Under this model, the agency (the DOE in the case of this study) makes the decision and then announces and defends that decision to the public, rather than the public being allowed to participate in agenda setting and thereby significantly affect the decisions being made. It's only after the agency has made a policy decision that the public is informed, be it through public hearings or some other venue, and asked to provide input or express concerns about that policy. Delores Foley has written that one of the dilemmas of public administration is that "too often, citizen input is requested after a decision has been made. Deliberation is a way of making decisions, but it is of no use when a decision has already been made. In

[19] Matthew D. McCubbins, and Thomas Schwartz, "Congressional Oversight Overlooked: Police Patrols Versus Fire Alarms," *American Journal of Political Science* 28: 165-179 (1984).

many cases, solutions posed have been predetermined by the ways that issues have been framed."[20] As a result, the DOE and its contractors, not the communities whose health and environment are directly affected, are at the center of power over policy outcomes.

Evidence of the DOE's inability to self-regulate and its long history of health and environmental violations have contributed to significant public distrust of the agency and its contractors regarding their ability to make decisions about health, safety and the environment. Distrust of the DOE has led community-based groups and members of the public to oppose and contest DOE decisions, including through litigation, resulting in policy implementation delays and diversion of time, money and resources. Community-based groups have pushed to open up the decision-making process for early public involvement. As several regulators told me in interviews, if the public is involved early on, there is greater potential for acceptance and legitimacy of decisions reached. In addition, public participation can reduce conflict between government and society, and it *has the potential* to increase trust in government institutions.

Methods

In this dissertation, I conduct an in-depth analysis of the efforts of community-based organizations to monitor and participate in environmental remediation and waste management processes, and to involve the public. To do so, I analyzed hundreds of Congressional records, government documents, and news articles, as well as materials produced by community-based groups. I also conducted interviews with government officials, and with leaders and staff of organizations whose mission is to remediate

[20] Delores Foley, "We Want Your Input: Dilemmas of Citizen Participation," In *Government Is Us: Public Administration in an Anti-Government Era*, edited by Cheryl Simrell King and Camilla Strivers, 140-157 (Thousand Oaks, CA: Sage Publications, 1998), p. 156.

radioactive and toxic pollution emanating from sites in the nuclear weapons complex and to educate the public about how to get involved. The purpose of the interviews was to:

1. Obtain information about the catalyst for the organization's founding (for example: an accident, discovery of health or environmental concerns, in response to a federal law, etc.).
2. Gather information about the range of activities that organizations engage in with regards to remediating nuclear weapons sites and educating the public about the issues, political processes and opportunities for engagement around these sites.
3. Assess how federal laws (such as the National Environmental Policy Act, the Comprehensive Environmental Response Compensation and Liability Act, the Resource Conservation and Recovery Act, etc.) have affected the ability of organizations to engage in remediation processes and decision-making at nuclear weapons sites and how organizations have worked with members of Congress on these laws.
4. Assess how organizations have developed expertise on health, safety, nuclear remediation and waste management issues.
5. Gather information about how these organizations work with federal, state and local regulators and how responsive federal, state and local regulators are to concerns and technical information that these organization raise.
6. Assess how effective organizations have been at watchdogging remediation and achieving their goals.
7. Determine how networking and information sharing with other groups around nuclear sites impacted the work of the organizations and policy outcomes.

Many of the organizations and individuals I interviewed for this project described how they went about educating themselves and others about complex technical information and political processes in order to participate in remediation and waste management decisions. Many individuals also highlighted the continued dominance of the federal government, especially the Department of Energy, in remediation and waste management processes and decision-making. However, when the federal government and DOE are dominant in decision-making, the results are often not ideal for the health and environmental sustainability of communities. When the DOE is dominant, remediation and environmental standards and objectives are often sacrificed in order to save on costs. Furthermore, DOE is beholden to the contractors it employs to do the work, and in many

cases, though not all, the contractors do not share the same long-term interests as the communities affected by contamination and environmental degradation. In addition, many contractors, though not all, are reluctant to include the public in decisions.

Although the system is far more open to the public now than it was before the end of the Cold War, many organizations expressed that despite its stated goals of public participation, the DOE seeks to dominate the ways in which the public can "participate" in decisions and processes. In the view of many community-based groups, "participation" has continued to carry more superficial meaning insofar as DOE is concerned, and the process remains "decide-announce-defend" at many sites, even though the agency deploys a range of efforts to involve the public. From the perspective of community-based groups, they would prefer "public engagement," whereby the DOE and its contractors would offer groups and communities greater access to technical information and expertise that would better inform decisions affecting them, as well as greater input in the decisions that are made. As we will see in chapter four, one of the greatest reasons that the remediation of the Fernald nuclear site is viewed as a success is because DOE and its contractor, Fluor Fernald, heavily involved the community in the decision-making process, but it took significant pressure from community-based groups to reach that point.

Background and Issues

Although the DOE has embarked on an ambitious remediation program, it acknowledges that, "more than 100 of these sites cannot be cleaned up enough to permit unrestricted human access and will require long-term management, in some cases indefinitely."[21] Nuclear weapons production at facilities such as the Plutonium Uranium

[21] Committee on Long-term Institutional Management of DOE Waste Legacy Waste Sites, "Long-term Stewardship of DOE Legacy Waste Sites – A Status Report" (Washington, DC:

Reduction Extraction Plant at Hanford Site, Washington; Building 771 at the Rocky Flats Environmental Technology Site near Denver, Colorado; and the F and H Canyons at the Savannah River Site in South Carolina resulted in the largest sources of contamination from radioactive and toxic wastes that were the byproduct of nuclear weapons testing, development and production. The DOE's office of Environmental Management summarized the extent of the nation's waste and contamination problem in a 2000 report:[22]

- The need to remediate 1.7 trillion gallons of contaminated ground water, an amount equal to approximately four times the daily U.S. water consumption;
- The need to remediate 40 million cubic meters of contaminated soil and debris, enough to fill approximately 17 professional sports stadiums;
- The need to safely store and guard more than 18 metric tons of weapons-usable plutonium, enough for thousands of nuclear weapons;
- Managing over 2,000 tons of intensely radioactive spent nuclear fuel, some of which is corroding;
- Storing, treating, and disposing of radioactive and hazardous waste, including over 160,000 cubic meters that are currently in storage and over 100 million gallons of liquid, high-level radioactive waste;
- Deactivating and/or decommissioning about 4,000 facilities that are no longer needed to support active DOE missions;

National Academies Press, 2003), 1, http://www.nap.edu/openbook.php?record_id=10703&page=1.

[22] United States Department of Energy, Office of Environmental Management, Status Report on Paths to Closure (Washington DC, March 2000), http://energy.gov/sites/prod/files/2014/03/f8/StatusReportOnPathsToClosure_2000.pdf.

- Implementing critical nuclear non-proliferation programs for accepting and safely managing spent nuclear fuel from foreign research reactors that contains weapons-usable highly enriched uranium; and providing long-term care and monitoring—or stewardship—for potentially hundreds of years at an estimated 109 sites following remediation.

The following is just a sampling of some of the most contaminated sites that have impacted various environments and populations:[23]

- Hanford Site, Washington, which is the most contaminated site in the complex, has more than 1,400 individual waste sites, which range from structures, to reactors, to storage tanks to soil. It is one of the nation's largest remediation projects, with significant problems. Seventeen Native American tribes have been impacted by Hanford's environmental contamination and are involved in environmental remediation and waste management decisions. The site also contains hydrological and fire regimes that may be impacted by climate change. For example, according to the DOE, there are more than 760 solid and liquid waste sites associated with the Columbia River Corridor and remediation efforts involve preventing contamination from reaching the river, and cocooning or demolishing structures that are no longer in use.[24] The river was critical to Hanford during its plutonium production mission since river water was used to cool down the nuclear reactors when they were in operation. Within the 220 square mile corridor, the soil underneath may be contaminated and must be

[23] U.S. Department of Energy, Office of Legacy Management, Sites Database, http://www.lm.doe.gov/Considered_Sites/.
[24] Department of Energy, Hanford River Corridor, http://www.hanford.gov/page.cfm/RiverCorridor, accessed March 20, 2015.

remediated, along with the materials that caused the contamination. More than 1,000 structures above ground must be removed, but many of them are contaminated so steps must first be taken to ensure that neither workers nor the environment will be harmed during demolition.

- Lawrence Livermore National Laboratory, California, which is located 45 miles east of San Francisco and has 50,000 residents within a two-mile radius of the main site. Both on- and off-site groundwater have been contaminated with volatile organic compounds (VOCs) and chromium. Groundwater two miles west of the site in downtown Livermore is used as a municipal drinking water source.[25]
- Los Alamos National Laboratory, New Mexico, which is located immediately proximate to a city, with a community population living on the fence line and a pueblo with sacred lands within the boundary. It also contains hydrological and fire regimes that may be impacted by climate change.
- Moab Project, Utah, which contained some 16 million tons of uranium mill tailings, a radioactive sand-like material, stored on the banks of the Colorado River, left over from the former ore-processing site that operated for nearly three decades beginning in the mid-1950s and poses a long-term impact to the economic vitality of the tourist industry. As of July 2013, six million tons, or

[25] In 1984, the California Department of Health Services (CDHS) issued an order to LLNL to provide alternative water supplies to residents west of the facility, whose wells had been contaminated by hazardous substance. U.S. Environmental Protection Agency, Superfund Sites Database, http://yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/ViewByEPAID/CA2890012584.

roughly 38 percent of the tailings had been transported to a disposal site about 30 miles north. Disposal completion is expected in 2025.[26]

- Savannah River Site, South Carolina, which contains some 515 waste sites that have been linked to soil, ground and surface water contamination. The DOE and the South Carolina Department of Health and Environmental Control (SCDHEC) consider the high-level waste tanks the greatest risk to human health in South Carolina. Private contractors on the site are controlling the "Enterprise SRS" plan to develop the site for nuclear reprocessing and "Interim" spent fuel storage, often to the exclusion of the public and environmental stakeholders.[27]

In addition to the sites listed above that are located in the continental United States, Enewetok and Bikini Atolls in the Marshall Islands also remain contaminated. The United States, as a trustee of the Islands, conducted 67 atmospheric nuclear weapons tests amounting to 108 megatons (the equivalent of more than 7,000 Hiroshima bombs). A hydrogen bomb test in 1954 forced the inhabitants of Rongelap and Utrik Atolls to evacuate, and the overall contamination as a result of these tests is still a matter of contention. The Marshallese population has no representation in Congress, but relies on Congress for appropriations for environmental remediation and to compensate survivors and their families exposed to radiation. The Department of Interior also has responsibility for program stewardship and claims in the Marshall Islands. The U.S. has provided some $1.055 billion (in 2010 dollars, adjusted for inflation) to affected communities, or $1.87 million per original inhabitant of the four affected atolls (Bikini, Enewetak, Rongelap,

[26] Department of Energy, Overview of Moab UMTRA Project, Fact Sheet, http://www.gjem.energy.gov/moab/documents/factsheets/20130625OVERVIEW.pdf, accessed March 20, 2015.
[27] U.S. Department of Energy, Savannah River Site Profile, http://www.epa.gov/region4/superfund/sites/fedfacs/savrivsc.html.

and Utirik). Under the Compact of Free Association, and as part of the aforementioned compensation, the U.S. provided $150 million to the RMI to establish a nuclear claims fund. The RMI Nuclear Claims Tribunal awarded over $2 billion for personal injury, property loss, and class action claims between 1991 and 2003, but the payments from the Tribunal ceased in 2009 when claims awarded far exceeded the settlement amount and all existing funds had been disbursed.[28] The DOE's Special Medical Care Program and the Environmental Monitoring Program continue to provide services to the affected atolls.

To date, the DOE claims successful remediation at three sites: Rocky Flats, Colorado; Fernald, Ohio; and Mound, Ohio. By accounts from those involved in remediation processes, there is agreement from the community that Fernald's remediation was successful. According to interviews, the decision to involve the community in the remediation and the community's acceptance of responsibility for site remediation and waste management made it so successful. But as we will see, Fernald's story is somewhat unique. The level of public engagement by the DOE and its contractor at Fernald has not been repeated to the same extent across the nuclear complex. At Rocky Flats, non-governmental experts pointed out that the DOE rejected exposure standards that the public advocated in favor of cheaper and quicker options.

Remediation at U.S. sites alone is expected to take more than seven decades to complete and cost estimates range from $200-$350 billion.[29] As of December 2013, the

[28] Congressional Research Service Report to Congress, Republic of the Marshall Islands Changed Circumstances Petition to Congress, March 14, 2005, https://www.bikiniatoll.com/CRSreportCCP.pdf.

[29] In 1995, the office of Environmental Management issued its first comprehensive life cycle estimate of the full scope and cost to remediate the nuclear weapons complex in its "Baseline Environmental Management Report." At the time, the remediation and stewardship program was estimated to cost $200 to $350 billion over a 75-year period. "Evolution and History of the Department of Energy and the Office of Environmental Management," Department of Energy,

Department of Labor has spent an additional "10 billion dollars in compensation and medical bills paid" to DOE nuclear weapons workers (including employees, former employees, contractors and subcontractors).[30] DOE remediation and legacy waste management efforts fall within the purview of the Office of Environmental Management, which was created in 1989 with an annual budget of $1.6 billion or less than 10% of DOE's total budget at that time. By fiscal year 1994, EM's budget reached $6 billion, or roughly one-third of the department's budget that year. Since then, the annual budget has declined slightly, ranging from about $5.6 billion to $5.8 billion.[31] EM's budget is more than the entire budget of the U.S. Environmental Protection Agency (EPA) and about four times the size of U.S. EPA's annual Superfund expenditures. It is important to note, however that, according to DOE, about 58 percent of the EM's budget goes to "maintaining a safe, operations ready posture," that is, towards maintaining existing infrastructure, security operations, emergency and fire response services, utilities and other landlord activities.[32] Only about 33 percent goes to "completing cleanup necessary to meet future year regulatory deadlines," 6 percent to "cleanup necessary to meet current

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April 2014, http://energy.gov/sites/prod/files/2014/04/f15/Evolution_History_DOE_042314.pdf. At the end of Fiscal Year 2007, the DOE estimated the total overall cost of its environmental liabilities was $264 billion. U.S. Department of the Treasury, "Financial Report of the U.S. Government, Fiscal Year 2007." See Notes to the Financial Statements, Note 12 "Environmental and Disposal Liabilities, www.gao.gov/financial/fy2007financialreport.html.

[30] U.S. Department of Labor, Division of Energy Employees Occupational Illness Compensation (DEEOIC), "DEEOIC Reaches $10 Billion Milestone in Compensation & Medical Bills Paid," http://www.dol.gov/owcp/energy/.

[31] EM also received an additional $6 billion in funding under the American Recovery and Reinvestment Act of 2009 (Recovery Act) for cleanup projects, which was equivalent to one year of its annual budget. U.S. Government Accountability Office, "Most DOE Cleanup Projects Are Complete, but Project Management Guidance Could Be Strengthened," Report to Congressional Committees, (Washington, DC: U.S. GAO, October 2012), http://www.gao.gov/assets/650/649479.pdf.

[32] Terry Tyborowski, "The EM Budget," Intergovernmental Meeting with the US Department of Energy, Office of Environmental Management, December 14, 2012, http://www.nga.org/files/live/sites/NGA/files/pdf/1212IntergovMtgTyborowski.pdf.

year regulatory deadlines," and 3 percent to other cleanup costs not associated with regulatory deadlines. To put it another way, more than half of the so-called "cleanup" budget doesn't go toward "environmental" work, yet few in the public or media realize this. Furthermore, EM's budget is not regularly subject to scrutiny by Congress, DOE, EPA or state regulators.

Historically, the Department of Energy and its predecessors contracted private companies under fairly minimal government supervision to carry out missions at nuclear facilities and sites across the country. Contractors comprise roughly 90 percent of the DOE's workforce. Although federal field offices across the country had established rules and procedures, contractors developed and implemented their own protocols in the sites they managed and operated. Consequently, it was often the contractors acting on behalf of the federal government who were the custodians of records, and there was no central repository for data. In addition, no uniform criteria were established for organizing, recording or reporting data from across the sites, nor was a uniform requirement established for the duration of maintaining records.

DOE advisory groups, internal DOE studies, and the Government Accountability Office have found that DOE's dysfunctional structure, with unclear chains of command among headquarters, field offices, and contractors, has produced many confusing lines of authority and undermined accountability. For example, a 1997 DOE internal study noted a "lack of clarity, inconsistency, and variability in the relationship between headquarters management and field organizations. This is particularly true in situations when several

headquarters programs fund activities at laboratories."[33] The DOE itself concluded that the Department did not have a clear chain of command over environment, safety, and health matters and, as a result, environmental problems were allowed to go uncorrected. A 1997 congressionally mandated study by the Institute for Defense Analyses also criticized DOE's organizational structure, noting that it had resulted in confusion over who sets policy and duplication of management functions.[34] The report noted that DOE's hybrid of centralized and decentralized management practices for health, safety and the environment has resulted in "inadequate discipline regarding who should participate and how that participation should take place."[35]

The lack of accountability, self-regulation and secretive nature of the DOE and its predecessors has only served to heighten public distrust of the agency and its contractors. Several accounts over the last few decades have revealed health and environmental atrocities and the spread of misinformation by government agencies and their contractors in the development, production and testing of nuclear technology.[36] Public distrust has particularly attenuated following revelations of environmental contamination and health

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[33] U.S. Department of Energy, "DOE Action Plan for Improved Management of Brookhaven National Laboratory" (July 1997), p. 7, http://158.132.155.107/oess/POSH/Reports/DOE/bnlplan.pdf.

[34] Institute for Defense Analyses, "The Organization and Management of the Nuclear Weapons Program" (March 1997), www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA323402.

[35] Institute for Defense Analyses, p. ES-1.

[36] For a sample of a vast array of accounts, see: John Bradley, "Introduction: Invisibility" in *Learning to Glow: A Nuclear Reader*, ed. John Bradley (Tucson, AZ: The University of Arizona Press, 2000); Philip L. Fradkin, *Fallout: An American Nuclear Tragedy* (Tucson, AZ: The University of Arizona Press, 1989); Barton C. Hacker, "Setting Radiation Protection Standards: Science, Politics, and Public Attitudes in Historical Perspective," *Physics & Society*, 24, no. 3 (1995): 5-8; Mark Goodman, "Human Radiation Experiments," *Physics & Society*, 24, no. 3 (1995): 3-5; Beverly Ann Deepe Keever, *News Zero: The New York Times and the Bomb* (Maine: Common Courage Press, 2004); Eric Pooley, "Nuclear Warriors," *Time*, March 4, 1996, 47-54; Russell Watson, "America's Nuclear Secrets," *Newsweek*, December 27, 1993, 14-18; Eileen Welsome, *The Plutonium Files: America's Secret Medical Experiments in the Cold War*, (New York: Dial Press, 1999).

impacts as a result of the nuclear weapons development, production and testing cycle, as well as revelations of secret nuclear tests and experiments conducted on populations, including nuclear workers, Marshall Islanders, Native Americans, prisoners and the mentally disabled.

For example, off-site contaminant releases from the Rocky Flats Nuclear Weapons Plant became public knowledge after a large industrial fire in 1969. Public distrust of the DOE, its predecessor agencies, and its contractors that managed the Rocky Flats Nuclear Weapons Plant mounted in the 1970s as scientists measured radioactive contamination in off-site locations. Distrust further increased as the public called for more detailed information and the federal government withheld or misrepresented relevant information about the Rocky Flats Nuclear Weapons Plant in the interest of "national security." Following a 1989 Federal Bureau of Investigation (FBI) raid on the Rocky Flats Plant that led to the site's operators pleading guilty to criminal violations of environmental law, it became apparent that records of contaminant releases were incomplete and assembling quality exposure data would be difficult. Incomplete and inadequate records affected the ability of the Colorado Department of Public Health and Environment to conduct the Historical Public Exposure Studies and advise contractors. A 1992 Health Advisory Task Force decided that, "because of public distrust of government agencies and its contractors, reliance on these sampling studies alone would not suffice."[37]

In response to public distrust, the CDPHE Health Advisory Panel task force directly involved the public in a Citizens' Environmental Sampling Committee (CESC)

[37] Colorado Department of Public Health and the Environment, "Soil and Sediment Study of Off-site Areas Surrounding the Rocky flats Nuclear Weapons Plant" (1996).

in late 1992. The task force invited representatives of various groups, including homeowners' associations, public interest organizations, local health departments and concerned individuals, to participate as a group and conduct a soil-sampling study.[38] Results of the study confirmed findings of previous soil studies that found plutonium was released by the Rocky Flats Plant to the nearby off-site environment and generated soil concentrations above the upper limit of background expected from nuclear weapons testing fallout. The CESC study demonstrated the benefits of direct public participation as citizens designed and implemented the study independent of government or other influences, and the study added to the collection of data on off-site environmental contamination surrounding the Rocky Flats Plant.[39]

Public distrust of the DOE and its contractors has had several implications for policy planning and administration. For example, public distrust in DOE's handling of worker and community health studies led to the adoption of Memoranda of Understanding (MOU) in 1990, 1996 and 2000 between DOE nuclear facilities and the Department of Heath and Human Services (HHS) to transfer operation of the DOE's Worker and Public Health Activities Program to HHS agencies because "they are more trusted than DOE."[40] As a result, HHS agencies have been charged with conducting not only worker and human health studies, but also the communication of results regarding

[38] Norma C. Morin and Ann J. Lockhart, "Public Involvement in a Dose Reconstruction Study: The Colorado Story," Colorado Department of Public Health and Environment, p. 6-7.
[39] Colorado Department of Public Health and the Environment, "Rocky Flats Historical Public Exposures Studies Soil and Sediment Study Summary" (1996).
[40] Committee to Review the Worker and Public Health Activities Program, "Review of the Worker and Public Health Activities Program Administered by the Department of Energy and the Department of Health and Human Services" (December 2006), National Academy of Sciences, p. 3.

potential exposure of toxic substances to workers and the public.[41] A 2006 study by the Committee to Review Worker and Public Health Activities Program found that Health and Human Services agencies should be the main source of active risk communication and education programs at DOE nuclear facilities "due to significant evidence of continuing distrust of DOE and its contractors."[42]

DOE's legacy of mistrust and its organizational limitations have also made it difficult for the agency to engage communities surrounding nuclear weapons legacy sites in environmental remediation and future land use planning processes.[43] A large survey study of communities surrounding legacy nuclear weapons sites found that respondents' greatest concerns were threats to their drinking water, transportation accidents, and worker exposures. It also found that many distrusted the DOE's communications to them, thus posing challenges to the agency's ability to engage in effective partnerships with these communities and manage risks at sites over the long-term.[44] Another study has shown that there is widespread public opposition to a national repository for the storage of nuclear waste because of DOE's lack of credibility as a message source and because of public skepticism regarding the agency's performance.[45]

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[41] Committee to Review the Worker and Public Health Activities Program, p. 168.
[42] Committee to Review the Worker and Public Health Activities Program, p. 170.
[43] Michael Greenberg, Karen Lowrie, Donald Krueckeberg, Henry Mayer & Darien Simon, "Bombs and Butterflies: A Case Study of the Challenges of Post Cold War Environmental Planning and Management for the US Nuclear Weapons Sites," *Journal of Environmental Planning and Management*, Vol. 40, No. 6, 1997.
[44] Michael Greenberg, Karen Lowrie, Joanna Burger, Charles Powers, Michael Gochfeld, and Henry Mayer, "Nuclear Waste and Public Worries: Public Perceptions of the United States' Major Nuclear Weapons Legacy Sites," *Human Ecology Review*, Vol. 14, No. 1, 2007.
[45] Stephen E. Binney, Robert Mason, Steven W. Martsolf, and John H. Detweiler, "Credibility, Public Trust, and the Transport of Radioactive Waste Through Local Communities," *Environment and Behavior* (May 1996), vol. 28 no. 3, p. 283-301.

This study found that the public and interest groups continue to struggle with DOE, as well as other federal and state regulatory agencies, to be included in environmental remediation and waste management decisions and processes that directly affect their environment and health, even though Congress has made clear that the public should have meaningful opportunities to participate. While environmental remediation and waste management of the nuclear weapons complex requires expert knowledge training, it is also a matter of public policy. Environmental remediation and waste management decisions directly affect the health and environment of communities surroundings the sites, as well as workers involved in the efforts. Policy decisions should thus reflect the broad range of interests and values in communities and states housing nuclear sites. Furthermore, according to practitioners, involving a range of individuals with different values and concerns can lead to better information, better prioritization of issues, greater participation and more environmentally sustainable outcomes in the remediation and waste management processes and results.

One of the biggest issues facing communities living around nuclear weapons sites is that federal, state and local agencies and regulators often do not reveal environmental and health risks or downplay the risks to the public, or, in some cases, even deliberately mislead the public. Contamination from nuclear weapons production was hidden during much of the Cold War and justified on the grounds of national security. Just as one example, at the Paducah Gaseous Diffusion Plant in Kentucky, workers were exposed to plutonium and other radioactive materials for decades, but the government and its contractors did not inform workers about the hazards, even as cancer rates among

employees spiked in the 1980s.[46] In other areas, minority communities were deliberately exposed to radioactive materials. In the segregated southern state of South Carolina, the management at the Atomic Energy Commission, and later the DOE, exposed African American workers to radiation at the Savannah River Site.[47]

Navigating the Political System

As previously noted, community-based groups have come to play an important role in educating and involving the public in environmental remediation and waste management processes and decisions that directly affect the health and environment of local communities. Other important functions include monitoring and reporting activities at the nuclear weapons sites, keeping the DOE and its contractors accountable, keeping regulatory agencies accountable and informing the media. Community-based groups engage in a wide range of political activities to pursue these goals and functions. Although federal laws have been a mixed bag in terms of results, they have provided opportunities for organizations to become involved and to achieve environmental remediation and waste management in their communities, and to pursue litigation when they are shut out of decisions and processes by agencies or regulators. The National Environmental Protection Act (NEPA) of 1970, the Resource, Conservation and Reclamation Act (RCRA) of 1976, and the Comprehensive Environmental Response Compensation and Liability Act (CERCLA, aka Superfund) have given organizations and communities leverage to participate in environmental remediation and waste management

[46] Joby Warrick, "In Harm's Way, But in the Dark," Washington Post, Sunday, August 8, 1999, A1.
[47] Joseph Trento, "Race and Radiation: The Equal Opportunity Killer at the Savannah River Site," National Security News Service, September 6, 2012, http://www.dcbureau.org/201209067618/national-security-news-service/race-and-radiation-the-equal-opportunity-killer-at-the-savannah-river-site.html.

decisions by legally requiring public participation opportunities in such processes as Environmental Impact Statements (EIS), and permits for in-site and hazardous waste.

With growing public and scientific awareness of the natural world in the 1970s, public campaigns were launched to address multiple environmental concerns legislatively and to target members of Congress for their poor environmental records. As a result, Congress, working with the White House, passed numerous pieces of environmental legislation. These laws passed in the 1970s provided a framework for addressing contamination at nuclear sites and involving the public in environmental decision-making activities. The National Environmental Protection Act (NEPA), which was signed into law on January 1, 1970, is one of the federal laws organizations use to constrain future nuclear weapons programs and press for environmental remediation at nuclear sites. Most of the DOE's nuclear weapons activities are major federal actions requiring NEPA review. The review process under NEPA provides an opportunity for written and oral public input to oppose, alter and change these activities. Organizations have pursued significant litigation under NEPA against many DOE proposals, which has led to projects being scaled back, indefinitely delayed and even abandoned. One significant example discussed in chapter three was a NEPA lawsuit filed by thirty-nine organizations in the mid-1990s that resulted in disclosures regarding contamination and waste management at DOE sites. The lawsuit settlement also established a $6.25 million settlement fund for citizen monitoring and technical assistance to hundreds of community-based groups and tribes around the country directly affected by DOE's polluting activities.[48]

[48] *Natural Resources Defense Council, et al. v. Richardson, et al.*, Civ. No. 97-936 (SS) (D.D.C. Dec. 12, 1998).

The Resource, Conservation and Reclamation Act (RCRA) of 1976 is the principal law governing the disposal of hazardous waste in the United States. Congress passed the law in response to concerns about protecting human health and the environment from increasing volumes of hazardous waste. Under RCRA, the EPA must notify the public of intent to issue or deny a permit for hazardous waste disposal. The law provides the public with 45 days to comment on a permit application. The EPA is also required to consider public comments regarding permit violations and to notify the public of proposed major modifications to an operating permit. The RCRA permit process provides leverage to organizations and communities to gain additional agreements from the DOE or contractors. In spite of its benefits, however, the RCRA process can be technical and lengthy and is therefore not always conducive to public participation.

Interest groups play a significant role in RCRA permitting processes by monitoring the permitting processes and translating technical information for the public and the press. The thirteen-year delay of the opening of the Waste Isolation Pilot Project (WIPP) in New Mexico discussed in chapter five is one example of the way in which community groups have used the RCRA permitting process to call for greater protections for the environment and human health as the government sought to establish the nuclear waste facility. Organizations, including the Southwest Resource and Information Center, a community-based public interest and technical assistance organization in New Mexico, advocated a prohibition on remote handled waste in the original permit for the WIPP nuclear waste site. As a result of participating in the RCRA process, SRIC and other community-based organizations were able to get the concession of no remote handled waste for the first six years of the site's operation. Furthermore, SRIC successfully

advocated for a number of safety provisions that otherwise would not have been included in the original permit for WIPP. However, the DOE has worked over time with more receptive state administrations in New Mexico to dilute the RCRA permits for the site. SRIC contends safety provisions in the original WIPP permit were directly responsible for the fact that the facility didn't have the kind of disasters as occurred in February 2014 when radiation was leaked to the surface and forced the site's closure.[49]

The Comprehensive Environmental Response Compensation and Liability Act (CERCLA, aka Superfund) also provides significant opportunities for public participation in environmental remediation and waste management decision making at most sites.[50] Many organizations use the law to engage the public and to advocate for best practices, for reasonable schedules and to ensure that the agencies involved seek the appropriate amount of funding to meet remediation and waste management milestones at a given site.

Often times, processes provided by these laws are the only leverage communities have to try and impact decisions that directly affect their health and environment.[51] However, these communities are far under-resourced in terms of their ability to participate compared to the ability of the federal government and its contractors. Furthermore, most federal and state agencies are beholden to companies contracted to remediate and manage waste at the sites, rather than being accountable to the communities. While these federal laws are important, they also require a very large investment of time and they don't always ensure the level of response that the communities desire. For example, much of the debate over remediation and waste management comes down to "how clean is clean." In general, communities often push for

[49] Don Hancock, Interview with Author, July 10, 2014.
[50] 42 U.S. Code § 9601. Available at: http://www.law.cornell.edu/uscode/text/42/9601.
[51] Don Hancock, Interview with Author, July 10, 2014.

higher standards of remediation to protect their health and environment, while contractors, and federal, state and local government entities often settle on lower standards because of cost and time concerns.

Because they are at an information disadvantage vis-à-vis government agencies (especially the DOE) and contractors, interest groups also use the Freedom of Information Act of 1966, as well as Whistleblower protection laws, to gain access to non-classified agency information.[52] Under FOIA, government agencies "are encouraged to make discretionary releases of information in cases in which no foreseeable harm from the release of the information can be determined."[53] Organizations have filed FOIA actions to release formerly confidential information about public health and environmental impacts from weapons production to the public. However, the DOE and its National Nuclear Security Administration (NNSA) have notoriously slow response times to FOIA requests.[54] In a recent example, a federal judge ruled in 2008 that the NNSA unnecessarily delayed responding to numerous records requests from Citizen Action, a citizen's group in New Mexico seeking information on nuclear waste sites at the Sandia National Laboratories.[55] Making use of FOIA's strong attorney provision fee, interest groups have often resorted to litigation to obtain documents as a result of DOE obstruction and slow response rates.

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[52] DOE regulations that implement FOIA fall under Title (Volume) 10 of the Code of Federal Regulations at Part 1004. Available at: http://energy.gov/oha/part-1004-freedom-information.
[53] The Freedom of Information Act, 5 U.S.C. § 552, As Amended By Public Law No. 104-231, 110 Stat. 3048. Available at: http://www.justice.gov/oip/foia_updates/Vol_XVII_4/page2.htm.
[54] On agency responsiveness to FOIA requests, see David E. Lewis and Abby K. Wood, "The Paradox of Agency Responsiveness: A Federal FOIA Experiment," Vanderbuilt University, Working Paper, June 2012, http://www.vanderbilt.edu/csdi/research/CSDI_WP_06-2012.pdf.
[55] Amy Harder, "Citizens group wins FOIA battle with nuclear agency," Reporters Committee for Freedom of the Press, April 4, 2008, http://www.rcfp.org/browse-media-law-resources/news/citizens-group-wins-foia-battle-nuclear-agency.

Interest groups also use the political system to challenge nuclear weapons policy, to press for environmental remediation and waste management of sites by engaging in direct advocacy and lobbying to Congress, and targeting committees with oversight of the nuclear complex, such as the House and Senate Energy and Water Appropriations Subcommittees, the Senate Environmental and Natural Resources Committee and the House Committee on Natural Resources. There have been some periods in which members of Congress have emerged as champions, but sustained Congressional oversight has proved illusory, making the oversight function of community groups that much more important.

Community groups have also emerged as advocates for workers' health and rights. For example, the Alliance for Nuclear Accountability and its member organizations have worked with members of Congress to pioneer federal legislation, including the 1990 Radiation Exposure Compensation Act and its subsequent amendments, to aid workers made ill by on-the-job exposures at nuclear weapons sites. Groups also worked with Congress to establish the Energy Employees Occupational Illness Compensation Program at the Department of Labor and they have also garnered congressional support and funding for a Resource Center to inform workers about their rights.[56]

The political and legal framework for environmental remediation and waste management decisions and processes demonstrates the dynamics of American federalism today. Although the federal government and DOE are dominant, both state and federal laws and agencies have jurisdiction over environmental remediation and waste management decisions. Community-based groups have used state laws to obtain

[56] Marylia Kelley, Interview with author, July 3, 2014.

information about health conditions, contamination and environmental degradation at nuclear complex sites. In addition, many organizations shared experiences of how they used state standards to press federal regulators for better remediation objectives. They have worked with state agencies to enforce state law where appropriate, and with local governments to oppose nuclear weapons activities, as well as to promote environmental remediation and waste management missions. As an exemplar, Tri-Valley CAREs halted a plan to send up to 80 million gallons of untreated, contaminated groundwater emanating from Lawrence Livermore Nuclear Laboratory into the San Francisco Bay. The EPA ultimately supported Tri-Valley CAREs' position and forced the DOE to withdraw the faulty plan in November 2007. Tri-Valley CAREs pressed the government to send the water back to the Lab for treatment on-site in a specially built facility, which is still operating today.[57]

Organization

The remainder of this dissertation is organized as follows. In chapter two, I discuss in more the depth the historical development of the political and legal framework that governs the regulatory processes for remediation and waste management decisions at DOE nuclear weapons facilities. It also discusses Congressional efforts to hold DOE accountable for environmental pollution and health threats by extending regulatory authority to the states and EPA and expanding public participation. In chapter three I explore the factors that made nuclear weapons issues the focus of elevated public discourse. I trace the rise of community-based grassroots interest groups and the movement for accountability and openness at DOE. Chapters four and five turn to in-

[57] Tri-Valley Communities Against a Radioactive Environment, "Looking Back, Providing the Framework for Moving Forward," Report Prepared for Tri-Valley CAREs Strategic Planning Meeting, August 16, 2008, 4, http://www.trivalleycares.org/stratpln08.pdf.

depth analysis of the efforts of grassroots groups at specific sites to educate and involve the public, and to watchdog and participate in environmental remediation and waste management processes. I examine the extent to which these organizations work within, and sometimes around, the political process to achieve environment, health and safety objectives for their communities. I also analyze the networks these organizations form with each other, as well as how they work with local, state and federal officials to achieve overall environmental, health and safety goals. I conclude with a reassessment of the contributions of this research to our understanding of macropolitical trends in American politics and implications for democratic governance. I also reassess the contributions of community-based grassroots groups to regulatory politics and discuss ongoing challenges for public inclusion in regulatory policy and decision-making processes at the federal, state and local level. This dissertation reveals variances across states and current and former nuclear weapons sites regarding the extent to which regulatory laws are enforced and implemented, and the extent to which community-based grassroots groups and the public are able to engage in decisions that have great impact on their lives.

Chapter Two: The Labyrinthine Regulatory Framework for Remediation

Throughout the Cold War, the Department of Energy (DOE) and its predecessor agencies operated the nation's nuclear weapons program in a political void. National security trumped all other concerns in the primary task of weapons production. As Energy Secretary Admiral James Watkins later admitted, the agency operated in secrecy and was inattentive to the health and environmental implications of nuclear weapons complex activities.[58] DOE and its predecessor agencies used the rubric of "national security" to claim "sovereign immunity" from environmental, health and safety oversight and regulation. In addition, because of the scientific and technological complexity related to nuclear weapons research, development and production, only a small group of experts were considered qualified enough to participate in decisions, which also contributed to limiting the number of decision-makers and insulating the DOE from external oversight and regulation. Because of the nature of the nuclear complex – involving national security, secrecy, and high stakes – it was very difficult to establish through legislation or regulatory guidelines an effective means for insuring that "externalities" – environmental pollution and threats to health and safety that are byproducts of the nuclear complex's primary task of weapons production – received due attention and for establishing mechanisms for compliance. With the end of the Cold War, the environment that had walled off the nuclear complex from pressures for accountability began to change.

Addressing the health and environmental legacy of nuclear weapons testing, development and production has presented particularly difficult challenges. Much of the

[58] Secretary of Energy Advisory Board, "Earning Public Trust and Confidence: Requisites for Managing Radioactive Wastes," Final Report of the Secretary of Energy Advisory Board Task Force on Radioactive Waste Management (Washington, DC: U.S. Department of Energy, 1993), p. 1.

waste produced from nuclear weapons is radioactive and cannot be eliminated or even neutralized. It must be contained, stabilized or moved to a safer place. Treatment and disposal technologies do not exist for some types of waste, and storage facilities are not available for other types. Environmental management and remediation across the nuclear complex has also been compounded by the constraints of the Congressional budget and appropriations process. In addition to the technical and budgetary challenges, environmental management and remediation is made even more difficult by a complex regulatory framework. This chapter provides an overview of the federal statutes that govern remediation at federal defense nuclear facilities. The Atomic Energy Act of 1946 and its amendments, the Resource Conservation and Recovery Act of 1976 and its amendments, the Comprehensive Environmental Response, Compensation and Liability Act of 1980 and its amendments, and state laws and regulations all play a role in the regulatory framework. Through its Environmental Assessments and Environmental Impact Statement processes, National Environmental Policy Act of 1970 has also provided important mechanisms for oversight of the Department of Energy and remediation at defense nuclear facilities. Yet these laws have produced a labyrinthine regulatory framework that has required federal agencies to establish public participation programs and has determined the way in which state and local officials, interest groups and communities participate in remediation decisions and processes.

Remediating environmental contamination from the development, testing and production of nuclear weapons is complex not only because of the technical solutions required to manage vast quantities of hazardous and radioactive materials, but also because of the convoluted regulatory framework governing health, safety and

environmental remediation and management. Several historical and legal factors have shaped the regulatory framework for remediation across the nuclear complex. These factors include the Department of Energy's historical self-regulation and the secrecy inherent in its national security objectives; Congressional delegation of overlapping authorities or unclear intent of authority in regulatory legislation; and lack of regulatory agency enforcement authority and budget. These factors have also affected the health, environment and safety at defense nuclear sites and their surrounding communities and have determined the ways in which state and local officials, public interest groups and communities can participate in remediation decisions and processes.

The fact that DOE nuclear weapons facilities are owned by the federal government has posed particular enforcement challenges for federal and state regulatory agencies. I call this structure of regulatory framework for remediation at nuclear weapons sites "antagonistic federalism." As I will elaborate in this chapter, the major reasons for the tug-of-war over regulatory authority between federal, state and local agencies at defense nuclear facilities are three-fold. First, the DOE has historically considered itself above the regulatory law because its mission during the Cold War was to develop nuclear weapons for the nation's defense. Secrecy, justified under the cloak of "national security," has often undermined the ability of federal and state agencies to obtain information and effectively regulate sites. In addition, the DOE was historically self-regulating through provisions of the Atomic Energy Act, and until the mid-1990s had neither the internal organization nor a substantial budget to comply with environmental management and regulation issues. However, even after the DOE established its office of Environmental Management (EM) in 1989, numerous analyses by both governmental and

nongovernmental organizations have noted that there remain a lack of clear goals and accountability in the EM program and that millions, if not billions, of dollars have been wasted on mismanaged or misguided projects.[59]

Second, legislation relevant to environmental regulation of defense nuclear facilities has been complicated by overlapping designations of authority and by a lack of clear intent by Congress in some cases. As a federal department, the DOE (or the Department of Justice acting on the DOE's behalf in court) has traditionally claimed "sovereign immunity" from state regulation. Although Congress passed important environmental laws in the 1970s, such as the Clean Air Act and Clean Water Act, to address growing environmental concerns, these laws did not directly address the radioactive and chemical contamination from decades of nuclear weapons development, testing and production. The environmental laws of the 1970s were not necessarily clear regarding authorities, especially for the states, to regulate federal agencies, such as the Department of Energy. Furthermore, early environmental laws lacked enforcement mechanisms to compel the DOE to comply with regulations.

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[59] Alliance for Nuclear Accountability, "Missing the Path to 'Cleanup': Root Causes of the Failures in the U.S. Department of Energy's Nuclear Weapons Environmental Program" (Washington, D.C., 1998); Congressional Budget Office, "Cleaning Up the Department of Energy's Nuclear Weapons Complex" (Washington, D.C.: CBO, May 1994); Marc Fioravanti and Arjun Makhijani, "Containing the Cold War Mess: Restructuring the Environmental Management of the U.S. Nuclear Weapons Complex" (Takoma Park, Maryland: Institute for Energy and Environmental Research, 1997); U.S. General Accounting Office, "Department of Energy: Opportunity to Improve Management of Major System Acquisitions" (Washington, DC: General Accounting Office, November 26, 1996); U.S. General Accounting Office, "Department of Energy's Project to Clean Up Pit 9 at Idaho Falls Is Experiencing Problems" (Washington, DC: General Accounting Office, 1997); U.S. General Accounting Office, "Management Problems at the Department of Energy's Hanford Spent Fuel Storage Project" (Washington, DC: General Accounting Office, 1998); U.S. General Accounting Office, "Process to Remove Radioactive Waste from Savannah River Tanks Fails to Work" (Washington, DC: General Accounting Office, April 1999); and U.S. General Accounting Office, "Nuclear Waste: DOE's Accelerated Cleanup Strategy Has Benefits But Faces Uncertainties" (Washington, DC: General Accounting Office, April 1999).

Third, it is often difficult for the Environmental Protection Agency to aggressively enforce regulations at DOE defense nuclear facilities. Depending on priorities in any given presidential administration, EPA is given more or less leeway to pursue regulatory enforcement at its sister agencies. Furthermore, budget allocations to EPA have generally paled in comparison to budget allocations to the DOE's remediation program. Since the creation of the DOE's office of Environmental Management, budgets for remediation have averaged between $5-$6 billion per year, or more than the entire budget of the EPA and about four times the size of the EPA's annual Superfund expenditures.

Over time, Congress has attempted to address the shortfalls of the regulatory regime by strengthening the enforcement authority of the Environmental Protection Agency, providing greater leverage to the states in oversight of nuclear complex sites and by making clear its intent that the public should have early and meaningful opportunities to participate in environmental remediation decisions and processes. In this chapter I provide an overview and discuss a complicated regulatory framework that has attempted to bring the Department of Energy to account as revelations of the extent of the threats to human health and the environment were revealed and as missions at defense nuclear facilities changed following the end of the Cold War. In later chapters, I address how grassroots community organizations have navigated this labyrinthine regulatory framework to provide greater transparency and accountability and to engage in remediation decisions and processes.

Atomic Energy Act

Congress passed the Atomic Energy Act (AEA) in 1946 to promote the "utilization of atomic energy for peaceful purposes to the maximum extent consistent with the common defense and security and with the health and safety of the public." Under the Act, Congress gave control of the production and use of fissionable material to the Atomic Energy Commission (AEC), the predecessor of the Department of Energy, and the agency was charged with ensuring that nuclear energy was developed in a manner consistent with the security interests of the United States. Driven by concerns that the Espionage Act of 1917 was inadequate to protect atomic energy information, Congress specifically restricted the dissemination of all atomic energy information under the AEA. Under the AEA, the AEC and its successor agencies were also made responsible for ensuring safety at their own facilities through a procedure known as "self-regulation," which was implemented through a system of internal rules (now called DOE Orders) and requirements. The DOE also regulates radioactive materials and releases of radioactivity to the environment at sites subject only to Resource Conservation and Recovery Act authority. That is, the DOE's own internal directives regulate radioactive waste management and radionuclide releases into the environment.

Congress amended the Act in 1954 to make way for the development of a civilian nuclear industry. Under the amended Act, the AEC was responsible both for the development and production of nuclear weapons and for the development and the safety regulation of the civilian uses of nuclear materials. Under the Energy Reorganization Act of 1974, Congress separated the licensing and weapons and energy development functions. Congress eliminated the AEC and created the Energy Research and Development Administration (ERDA) to oversee the development and production of

nuclear weapons, promotion of nuclear power, and other energy-related work, and the Nuclear Regulatory Commission (NRC) to oversee licensing and regulation, not including the regulation of defense nuclear facilities. Under the Energy Reorganization Act of 1977, the Department of Energy replaced ERDA. Congress placed emphasis throughout this legislation on regulating the production and use of nuclear materials. While Congress paid attention to the ultimate disposal of high-level radioactive wastes, day-to-day waste management and remediation issues were of lesser concern until the late-1980s.

Large DOE facilities, such as those located in Oak Ridge, Hanford, Idaho and Los Alamos, were constructed in remote areas away from large populations in order to maintain secrecy about development of nuclear weapons and because relatively little was known about the short- and long-term health effects of the radiological and chemical components of nuclear materials. The main purpose of the facilities was weapons production, and thus waste disposal and management were of secondary concern for the DOE and operators at these production sites.

Beginning in the 1970s, Congress passed new laws to deal with environmental pollution, including the National Environmental Policy Act of 1970, the Clean Air Act of 1970, the Clean Water Act of 1972 the Safe Drinking Water Act of 1974, the Resource Conservation and Recovery Act of 1976 (RCRA), the Toxic Substances Control Act of 1974 and the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA, a.k.a. Superfund). However, as originally enacted, these laws often specifically exempted wastes regulated by the DOE and its predecessors. Furthermore, these laws often did not identify federal facilities as being subject to their provisions.

Thus, the DOE did not consider itself subject to the provisions of the new environmental laws. Rather, the DOE continued self-regulation under the Atomic Energy Act.

Another issue raised by the enactment of the new environmental laws of the 1970s was that they provided for overlapping designations of authority, and some laws lacked clear intent by Congress. Although the environmental laws of the 1970s and early 1980s did provide a role for the states in regulating hazardous substances and protecting human health and the environment, the DOE continued to make the case that it had "sovereign immunity" from state regulation because it was a federal facility.

Thus, the federal government has historically dominated the regulatory and lawmaking processes related to remediation decisions at defense nuclear facilities. Federal courts have upheld this as a general principle, citing that Congress has preempted the field of nuclear health and safety regulation through the passage of the Atomic Energy Act of 1946 and the Energy Reorganization Act of 1974.

Federal preemption of state laws is rooted in various Constitutional provisions, including the commerce clause and the supremacy clause. Under Article VI, the "Constitution and the laws of the United States...shall be the supreme law of the land...anything in the constitutions or laws of any State to the contrary notwithstanding."[60] Preemption doctrine derives from this "supremacy" clause, which elevates the Constitution, as well as federal statutes and regulations above state laws. Where a state law is in conflict with a federal law, the federal law must prevail. However, a state law need not be utterly incompatible with a federal law in order to be preempted. The Supreme Court has long upheld the preemption doctrine not only where expressly written in federal statutes, but also in areas where Congress has "occupied the field." That

[60] U.S. Constitution, art. 6.

is, where Congress has expressed an intent to displace state authority in a given area by establishing federal authority, state action can be preempted. As a result, federal courts have generally struck down state attempts to regulate processes or impacts of defense nuclear facilities.[61]

That the DOE has been responsible for regulating its own activities in regard to worker and public health and safety and in regard to most types of environmental discharges of radioactive materials has raised inherent conflict of interest issues. For example, activities prohibited by the aforementioned environmental laws for individuals and private corporations could be, and were, practiced at DOE facilities. Historically, the DOE has worked under extreme secrecy and justified doing so out of necessity to protect technological expertise and "national security." However, the DOE (and its predecessors) have also used secrecy under the cloak of national security as a means to deflect Congressional and public attention. As a result, DOE made decisions and operated the nuclear program in a political void and numerous health, safety and environmental problems developed across the nuclear weapons complex during the DOE's long-history of self-regulation.

There have been periods, usually following revelations of environmental contamination or health and safety violations, when Congress, the media and the public more intensely scrutinize the activities of the DOE, but otherwise, to a large extent, the

[61] In 1959, Congress amended the Atomic Energy Act to provide the states with greater, albeit limited, authority in regulating civilian nuclear reactors and wastes from these facilities. Thus, states do have laws and regulations related to civilian nuclear power, but they must be consistent with federal laws and regulations. Furthermore, the amendments to the AEA only muddied the waters regarding the division of federal and state authority. Tension between federal and state authority persists, and generally, the federal courts have followed a trend of preemption. See: Todd Garvey, "State Authority to Regulate Nuclear Power: Federal Preemption Under the AEA," Congressional Research Service, Report for Congress, September 6, 2011.

DOE oversees itself. One of the most intense periods of DOE scrutiny began with the winding down of the Cold War when a number of Congressional committees held hearings to examine the state of environmental problems and safety in the nuclear weapons complex and the DOE's record of management in these areas.[62] In addition, although they had been reported on for decades in local and regional papers, the problems and dangers associated with nuclear weapons production and sites finally gained the attention of the national press in 1988.[63]

Former Ohio Senator John Glenn and his staff played particularly important roles in exposing the extent of environmental contamination and health and safety violations across the nuclear complex. Beginning in 1980, Senator Glenn commissioned what was then called the General Accounting Office (GAO, now called the Government Accountability Office) to conduct reports on health, safety and environmental issues at defense nuclear facilities. The GAO pointed out that trade-offs between safety concerns and production goals were resolved internally within the DOE, and thus safety could be sacrificed for programmatic objectives, especially during the budget process. In the 21 reports requested by Senator Glenn and others that were issued between 1979 and 1987, the GAO consistently advocated "an outside organization, independent of funding by

[62] After 1977, the responsibilities of the Joint Committee on Atomic Energy were devolved primarily to the House and Senate Armed Services Committees and the House and Senate Appropriations Subcommittees on Energy, though other committees also had occasional hearings and say on the nuclear weapons complex. From the mid- to late 1980s, when Congressional action on issues related to the environment and safety in the nuclear complex intensified, other committees, especially the Senate Governmental Affairs Committee, which was chaired by Ohio Senator John Glenn. See: Priscilla Offenhauer, "Defense Nuclear Facilities Safety Board: The First Twenty Years," A Report Prepared by the Federal Research Division (Washington, DC: Library of Congress), September 2009, pp. 43-44.

[63] William Lanouette, "Tritium and The Times: How the Nuclear Weapons Production Scandal Became a National Story," Research Paper for the Joan Shorenstein Barone Center on Press, Politics and Public Policy, Harvard University, May 1990.

DOE" or "an independent review panel not associated with DOE" to assure Congress and public that DOE's facilities are safe.[64]

In addition to the GAO reports, at the prompting of his staff, including nonproliferation experts Leonard Weiss and Leonard Spector and environmental activist Robert Alvarez, Senator Glenn used his position as Chair of the Senate Governmental Affairs Committee to hold Congressional hearings during the 100th Congress to bring national attention to the health and environmental impacts of defense nuclear production. These hearings resulted in revelations of the extent of health and environmental safety problems across the nuclear complex. For example, the first hearing on the Feed Materials Production Center at Fernald in Glenn's own state of Ohio revealed:

> [O]ver 230 tons of radioactive material from Fernald had leaked into the Greater Miami River valley during the preceding three decades. The whereabouts of another 337 tons of uranium hexafluoride . . . could not be documented. Thousands of kilograms (kg) of uranium dust had been discharged to the atmosphere and to surface water. Five million kg of radioactive and hazardous (mixed) substances had been released to pits and swamps, permitting percolation into groundwater. Concrete silos containing solid radioactive wastes had vented radon gas. Additionally, about two hundred thousand canisters and barrels at Fernald held mixed and hazardous wastes that had not been identified precisely.[65]

Other hearings conducted throughout the 100th Congress and the 101st Congress also documented serious evidence of DOE's failures to protect health, safety and the environment at and near defense nuclear facilities. Witnesses presented evidence of the age and design defects of defense reactors and the questionable integrity of structures at numerous sites. For example, one expert observed, "none of the military production

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[64] U.S. General Accounting Office, Nuclear Safety: Safety Analysis Reviews for DOE's Defense Facilities Can Be Improved, GAO/RCED–86–175 (Washington, DC, June 1986), http://archive.gao.gov/d4t4/130260.pdf.

[65] U.S. Congress, Senate Committee on Governmental Affairs, Environmental Issues at Department of Energy Nuclear Facilities, 100th Congress, 1st Session, March 17, 1987, 1–15.

reactors . . . had the pressurized steel and reinforced concrete containment building required by law for all civilian power reactors."[66] Robert Alvarez, who later joined Senator Glenn's staff, also testified about his concern for the potential for severe explosions in the high-level nuclear waste storage tanks at the Hanford Nuclear Reservation and the dispersal of radioactive materials. Witnesses documented other significant radioactive releases and leaks, and conditions that might lead to the release of radioactive contamination, such as plant fires and faulty ducts or piping. For example, a fire in the DOE's Rocky Flats plutonium manufacturing building, where there were few fire breaks, caused major accidental releases that led to increased exposure to workers and nearby populations in 1969.[67] Witness testimonies also revealed widespread flouting of radiation protection policies. Testimonies showed that management at sites had recommended that workers not be informed when they exceeded radiation exposure limits. In addition, witnesses pointed to both DOE and non-DOE studies on the health impacts of radiation, including elevated risks of dying from cancer and other serious illnesses, including higher death rates from leukemia among workers at Oak Ridge, Rocky Flats and Savannah River Site.[68]

Finally, the hearings brought to light evidence of the DOE's record on environmental protection and management. According to expert testimony, the DOE and its predecessors had used air, soil, ground and surface waters since World War II to

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[66] Kevin O'Neill, "Building the Bomb," in Stephen I. Schwartz, ed., Atomic Audit: The Costs and Consequences of U.S. Nuclear Weapons Since 1940 (Washington, DC: Brookings Institution Press, 1998), 73.
[67] Len Ackland, *Making a Real Killing: Rocky Flats and the Nuclear West* (Albuquerque: University of New Mexico Press, 2002), 3, 86, 143–63.
[68] U.S. Congress, House of Representatives, Committee on Energy and Commerce, Subcommittee on Energy and Power, *Safety of DOE Nuclear Facilities: Hearings on H.R. 783, H.R. 2047, and H.R. 3123*, 100th Congress, 1st Session, November 5 and 19, 1987, 184.

dispose of massive amounts of radioactive and toxic pollutants. For example, Keith O. Fultz, Associate Director, U. S. General Accounting Office, testified that a July 1986 GAO report found that at DOE's Savannah River Plant:

> The radioactive contamination in one stream was about 750 times greater than drinking water standards. They also have contaminated groundwater – some concentrations were about 116,000 times greater than drinking water standards. In addition, leaks from high-level waste storage tanks have contaminated about 30,000 square feet of soil underlying the tanks. As a result of the contamination at the facility, the possibility exists that some radioactive contamination could reach the Tuscaloosa aquifer. In addition, because of the extensive contamination, institutional controls and oversight at the facility may be needed for hundreds of years.[69]

Fultz also testified that:

> DOE facilities in Colorado, South Carolina, and Tennessee contaminated the groundwater with solvents (cleaning agents) that are as much as 1,000 times above proposed drinking water standards. Other DOE facilities in South Carolina and Washington State contaminated the groundwater with radioactive materials that are more than 400 times greater than drinking water standards. At Mound and Fernald in Ohio, the contamination has migrated off-site into drinking water supplies – both a well and an aquifer.[70]

Ohio's Attorney General Anthony J. Celebrezze, Jr. also testified about DOE's activities and disposal practices at the Portsmouth Uranium Enrichment Complex:

> During a ten-year period beginning in 1974, DOE pursued a policy of disposing some of its radioactive and solvent-contaminated waste oil by spreading it on the ground and then roto-tilling it into the soil. About 50,000 gallons were disposed in this fashion.[71]

As revealed in Congressional hearings and in media reports, the DOE's historic self-regulation under the Atomic Energy Act has raised inherent conflict of interest issues

[69] U.S. Senate, Report of the Committee on Governmental Affairs on The Nuclear Protections and Safety Act of 1987 to Accompany S. 1085, 1987, 6.
[70] U.S. Senate, Report of the Committee on Governmental Affairs on The Nuclear Protections and Safety Act of 1987 to Accompany S. 1085, 1987, 6-7.
[71] U.S. Senate, Report of the Committee on Governmental Affairs on The Nuclear Protections and Safety Act of 1987 to Accompany S. 1085, 1987, 7.

between the separate goals of accomplishing the mission of the Department and protecting human health and the environment. Numerous health, safety and environmental contamination problems persist at sites throughout the nuclear complex, and public trust in the DOE to resolve issues remains low. Members of Congress, the Government Accountability Office, public interest groups and even the DOE's own advisory committees have long-criticized the agency for weakness in its self-regulation of the environment, safety and health at its own facilities. A 1995 DOE advisory committee composed of government, nuclear industry and non-governmental organization representatives concluded, "Widespread environmental contamination at DOE facilities and the immense costs associated with their cleanup provide clear evidence that self-regulation has failed… Every major aspect of safety at DOE nuclear facilities – facility safety, worker protection, public and environmental protection – should be externally regulated."[72] In 1998, the Defense Nuclear Facilities Safety Board criticized the Department for failing to correct worker health and safety hazards. A 2008 Governmental Accountability Office report found that the office within the DOE with responsibility for enforcing nuclear safety policies fell short of the GAO's elements of effective independent oversight of nuclear safety: independence, technical expertise, ability to perform reviews and have findings effectively addressed, enforcement, and public access to facility information.[73]

Under self-regulation, the DOE was allowed to establish its own standards for radiation safety that differ from the uniform standards followed by other federal agencies.

[72] Department of Energy Advisory Committee on External Regulation, "Improving Regulation of Safety at DOE Nuclear Facilities," December 1995.
[73] U.S. Government Accountability Office, "Department of Energy Needs to Strengthen Its Independent Oversight of Nuclear Facilities and Operations," GAO-09-61, Washington, D.C., October 2008.

In so doing, the DOE has created and is perpetuating a dual system of safety protection for radiation workers that differs from the rest of the country. As the Health Physics Society has noted, "Differences in occupational radiation safety programs of this nature within the United States undermine the credibility of our radiation safety programs, result in confusion for the workers and adds to the general lack of public understanding about radiation issues."[74]

Although Members of Congress, public interest groups and the GAO have recognized the need for greater regulation of DOE operations and facilities, external regulation of safety and security remains elusive. Members of Congress have introduced numerous legislative proposals to place all or parts of the DOE complex under external regulation by the Nuclear Regulatory Commission for radiation protection programs and the Occupational Safety and Health Administration (OSHA) for other worker safety programs. However, none of the legislative proposals have been enacted. Under the leadership of Senator John Glenn, Congress established the Defense Nuclear Facilities Safety Board within the Executive Branch in 1989 and it can make formal recommendations on safety issues (the most powerful mechanism it possesses). However, these recommendations are non-binding and the DNFSB has no real regulatory authority. Furthermore, the DNFSB itself acknowledges that since 1995, it has reduced reliance on formal recommendations, to which the Energy Secretary must respond. Instead, the board has increasingly used discussions with the DOE's executive management, public hearings and written correspondence.[75]

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[74] Kevin L. Nelson, President of the Health Physics Society, Letter to Dr. Thomas J. Laetz, Senior Policy Analyst, United States General Accountability Office, August 21, 2007. Author Copy.
[75] Defense Nuclear Facilities Safety Board, "Who We Are," http://www.dnfsb.gov/about/who-we-are, accessed October 4, 2014.

Public interest groups and advisory committees have argued that citizen participation, and citizen lawsuits in particular, would help to counter self-regulation under the Atomic Energy Act and create a more effective and credible regulatory regime. These groups have proposed amending the AEA to include a citizen suit provision, which, unlike other environmental regulatory laws, the AEA lacks. Public interest groups have argued that citizen suits provide one of the most effective tools available to the states and the public for ensuring DOE accountability and must be at the heart of the regime.[76] In addition, citizen suits can expose problems at DOE facilities that might otherwise go unheeded. The 1995 DOE Advisory Committee on External Regulation also recommended that citizens be allowed to sue the agency and its contractors in order to compel compliance with applicable statutes and regulations. As David E. Adelman, a project attorney for the Natural Resources Defense Council nuclear program, testified before Congress, "Public scrutiny enforcement is essential to agency accountability, particularly where, as here, state and Federal agencies will be enforcing laws against another government entity. Furthermore, making itself fully accountable to the public is the only way that DOE will restore its credibility."[77]

Employing Environmental Laws to Counter Self-Regulation and Secrecy

As Congress and the media began to pay increased attention to health, safety and contamination issues at both defense and civilian nuclear facilities in the late 1980s and as the public expressed greater concern over these issues, the existing regulatory

[76] Maureen Eldredge, "Prepared Statement of Maureen Eldredge, Program Director, Alliance for Nuclear Accountability," Hearing before the House of Representatives, Subcommittee on Energy and Power, Committee on Commerce, 106th Congress, Second Session, March 22, 2000.
[77] David E. Adelman, Testimony in Hearing before the House of Representatives, Subcommittee on Energy and Power, Committee on Commerce, 106th Congress, Second Session, March 22, 2000.

framework prevented states from adopting laws directly aimed at holding the federal government accountable because of federal preemption of the nuclear field. States did attempt to exert authority under the environmental laws established by Congress in the 1970s to counter the historically self-regulating tendencies of the DOE and to engage in remediation decisions and processes. States have attempted to assert regulatory authority under the Clean Air Act and the Clean Water Act, though these laws address radioactive contaminants only as part of the much larger problem of exposure to environmental contaminants.[78] Recognizing the need to rein in the DOE, Congress amended both RCRA and CERCLA in the 1980s and 1990s to strengthen the regulatory authority of the EPA and the states in governing the DOE's remediation. Key among changes to RCRA was the enactment of the Federal Facility Compliance Act of 1992, which clarified the issue of sovereign immunity and changed the regulatory relationship between state and federal entities by giving states more leverage in oversight in remediation activities. In addition, as the federal government and the DOE began to rethink missions at defense nuclear facilities, the use of NEPA provisions became important tools for engaging the public in policy decisions.

Congress passed other significant legislation in the 1980s and 1990s to deal with the nation's growing nuclear waste problem. The Nuclear Waste Policy Act of 1982 addressed high-level and transuranic wastes and established a program to develop a geologic repository for storing high-level waste (HLW) and spent nuclear fuel (SNF). Although the NWPA assigned DOE the responsibility to site, build, and operate a deep

[78] The Clean Air Act also provides regulatory authority to the Environmental Protection Agency. Under section 309 of the bill, the Administrator of the EPA has the power to review and publicly comment on the environmental impacts of federal activities, as well as to consult with an agency, the DOE in the case of nuclear complex remediation issues, to resolve concerns about public health and welfare or environmental quality. 42 U.S.C. Section 7609.

geologic repository for the disposal of HLW and SNF, it also directed the EPA to develop standards for protection of the general environment from off site releases of radioactive material. Under the law, the Nuclear Regulatory Commission can only license DOE to operate a repository if it meets EPA's standards and all other relevant requirements. As amended in 1987, the law directs DOE to consider Yucca Mountain in Nevada as the primary site for the first geologic repository for HLW and SNF and prohibits the DOE from developing a second site, unless directed by Congress.

The Energy Policy Act of 1992 further strengthened the role of the EPA in promulgating "standards to ensure protection of public health from high-level radioactive wastes in a deep geologic repository that might be built under Yucca Mountain in Nevada." It directed EPA to issue site-specific public health and safety standards, "based upon and consistent with the findings and recommendations of the National Academy of Sciences..."[79]

The Waste Isolation Pilot Plant Land Withdrawal Act of 1992 (WIPPLWA) established the requirements for operating the WIPP repository for transuranic wastes (TRU) in New Mexico.[80] The Act set aside land to develop and build the repository, but it also assigned specific regulatory and enforcement roles to EPA, including setting general standards for the release of radioactive materials to the environment as a result of storing SNF, HLW and TRU and notifying future generations of the location and content of the repository. Under the law, Congress also directed the EPA to develop criteria for storing TRU at WIPP consistent with the general standards established and to certify that DOE and the site comply with the standards. EPA was charged with re-evaluating WIPP every

[79] Pub. L. No. 102-486, H.R.776.ENR, 102nd Congress.
[80] Pub. L. No. 104-201, H.R. 3230, 104th Congress.

five years to determine whether it should be recertified, and with ensuring that WIPP complies with other applicable environmental and public health and safety regulations.

Some of the strong regulatory provisions of WIPPLWA were gutted in 1996 in an amendment attached to the Defense Authorization bill as a result of lobbying efforts by the DOE and pressure to make way for the full operation of the facility. In a push to open the facility as soon as possible, Congress amended the Land Withdrawal Act to exempt WIPP from the RCRA Land Disposal Requirements, it withdrew requirements established in the original law that DOE conduct underground tests on-site with transuranic waste to determine whether it could be disposed of safely, and it deleted all references to retrievability. Plans for decommissioning the facility, for disposing of all TRU waste and for surveying the TRU waste at all DOE facilities were also removed.[81] Finally, a provision in the original act for a 180-day waiting period between EPA certification and waste emplacement in order to allow for Congress and public comment was reduced to 30 days.

RCRA and its provisions

The Resource Conservation and Recovery Act (RCRA) was passed on October 21, 1976 and amended the *Solid Waste Disposal Act* of 1965. With passage of RCRA, Congress set forth a more active and regulatory role for the federal government to address the nation's problems related to increasing municipal and industrial waste. RCRA is the nation's primary law governing the disposal of solid and hazardous waste. Among other things, the law set national goals for protecting human health and the environment from the potential hazards of waste disposal and for ensuring that wastes are managed in an

[81] Waste Isolation Pilot Plant Land Withdrawal Act Amendment, National Defense Authorization Act for Fiscal Year 1997, as enacted, Pub. L. No. 104-201, 110 Stat. 2422, 2853 (1996).

environmentally-sound manner. While the Comprehensive Environmental Response, Compensation, and Liability Act manages abandoned and historical waste sites, RCRA focuses on active and future facilities.

Although technically administered by the Environmental Protection Agency, in practice RCRA is largely enforced by state agencies exercising authority equivalent to the federal government. However, EPA retains the power to undertake enforcement, and the law requires only that the EPA Administrator give notice to the state in which a violation has occurred prior to issuing an order or commencing a civil action. RCRA also contains provisions for citizen enforcement actions, including allowing citizens to sue "any person…who is alleged to be in violation of" specific RCRA requirements.[82] That is, citizens can sue both against persons and entities alleged to have violated standards or permit requirements and against EPA in cases where the Administrator has failed to perform an action that is nondiscretionary under the act. Citizen enforcement actions under RCRA have been an important tool to prevent contamination and secure remedial measures. These actions have also allowed citizens to become the enforcers of laws and regulations when government has been reluctant to exercise its policing power under RCRA and other regulatory laws. Yet, such provisions also have the effect of placing a greater onus on individual citizens to protect their own health and property.

Historically, the Department of Energy stored and disposed of radioactive and mixed wastes at federally licensed commercial sites or in DOE-owned landfills, trenches, and above-ground vaults and followed its own standards for managing the wastes. Until 1987, DOE took the position that its storage and disposal of hazardous and mixed wastes from nuclear weapons activities were exempt from regulation under RCRA and other

[82] RCRA § 7002(a)(1)(A), 42 U.S.C. § 6972(a)(1)(A).

hazardous waste laws because of its Atomic Energy Act authority relating to national security and "sovereign immunity" from state regulation.[83] A 1984 Tennessee federal court decision proved a critical turning point. In early 1983, a federal employee charged there were pollution problems at the Oak Ridge Reservation. On May 17, 1983, in response to pressure from the state of Tennessee and Freedom of Information Act inquiries by a local newspaper, DOE released information disclosing that two million pounds of mercury from the Y-12 plant was lost or unaccounted for and a significant portion of the inventory was released into the environment between 1950 and 1977.[84] Following the DOE admission, the Legal Environmental Assistance Foundation and the Natural Resources Defense Council took the agency to court. In the seminal case, *LEAF v. Hodel*, Judge Robert Taylor found DOE in violation of RCRA at the Y-12 plant and ordered DOE to comply with all RCRA provisions.[85]

Responding to the 1984 federal court decision and to guidance issued by EPA and the Nuclear Regulatory Commission, DOE finally acknowledged that RCRA applied to the hazardous components of the Department's mixed wastes. As a result, DOE sites that treat, store, or dispose of hazardous and mixed wastes must obtain permits under RCRA to operate waste treatment, storage, and disposal facilities, meet RCRA's record-keeping and labeling requirements, and comply with RCRA's 1984 land disposal restrictions.

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[83] U.S. Department of Energy, "Nuclear Waste: Much Effort Needed to Meet Federal Facility Compliance Act Requirements," Report to Congressional Committees, May 1994, GAO/RCED-94-179, http://www.gpo.gov/fdsys/pkg/GAOREPORTS-RCED-94-179/html/GAOREPORTS-RCED-94-179.htm.

[84] ChemRisk Report to the Tennessee Department of Health, "Mercury Releases from Lithium Enrichment at the Oak Ridge Y-12 Plant: A Reconstruction of Historical Releases and Off-Site Doses and Health Risks," Reports of the Oak Ridge Dose Reconstruction, Vol. 2, July 1999, https://health.state.tn.us/ceds/OakRidge/Mercury1.pdf.

[85] *Legal Environmental Assistance Foundation v. Hodel*, 586 F. Supp. 1163 (E.D. Tenn. 1984).

DOE cannot dispose of hazardous and mixed wastes unless they can be pretreated to comply with EPA's standards or by an EPA-approved treatment technology.

RCRA has been amended on a number of occasions in order to close loopholes and further strengthen regulation of federal facilities. Under the Hazardous and Solid Waste Amendments of 1984, the federal government attempted to prevent future remediation problems by prohibiting land disposal of untreated hazardous wastes and establishing a corrective action program to investigate and clean up releases of hazardous wastes. The HSW Amendments also provided for increased enforcement authority for EPA, more stringent hazardous waste management standards, and created a new regulatory program for underground storage tanks. The HSW Amendments also authorized citizen endangerment actions, allowing citizens to force remediation where ongoing or past mishandling of toxic waste resulted in "imminent and substantial endangerment to human health and the environment."[86] According to one House Committee, the expansion of citizen suits would complement EPA enforcement "particularly where the Government is unable to take action because of inadequate resources."[87]

The FFCA & Removing DOE's Immunity to Environmental Laws

After the passage of the HSWA, congressional investigations revealed that a number of federal agencies continued to violate RCRA provisions. Neglect of environmental contamination and a lack of attention to environmental considerations at DOE defense nuclear facilities continued. In response, Congress passed the Federal Facility Compliance Act (FFCA), enacted on October 6, 1992, to further empower states,

[86] RCRA § 7002(a)(1)(B), 42 U.S.C. § 6972(a)(1)(B).
[87] House Committee on Energy and Commerce, Hazardous and Solid Waste Amendments of 1984, H. Rep. No. 98-198 at 53, 98th Congress, 1st Session (1983).

EPA and the Department of Justice to enforce RCRA provisions at federal facilities and to clarify the issue of "sovereign immunity".[88] Officials with knowledge of environmental policy and DOE operations recounted that although laws such as RCRA and CERCLA required the federal government to establish public participation programs, until Congress passed the FFCA, DOE believed it was exempt from complying with local, state and federal environmental laws because national security received priority over obeying environmental laws.[89]

Leading up to passage of the bill, Congressional hearings on the FFCA revealed three interrelated issues that Congress sought to address in the Act in order to prevent the DOE, and other federal agencies, from continuing to flout RCRA provisions.[90] First, national security considerations and secrecy regarding nuclear weapons development, testing and production contributed to neglect of environmental concerns and keeping environmental compliance issues out of sight from Congress and regulators. Secretary of Energy James D. Watkins stated the problem succinctly during a 1989 Congressional hearing: "These problems have resulted from a 40-year culture cloaked in secrecy and imbued with a dedication to the production of nuclear weapons without a real sensitivity to the environment."[91] Deputy Secretary of Energy W. Henson Moore further elaborated that nuclear weapons production was considered "a secret operation not subject to laws…no one was to know what was going on… The way the government and its

[88] *106 STAT. 1505. Public Law 102-386.* 102d Congress, October 6, 1992.
[89] Interviews with author.
[90] For a more extensive background on the issues raised, see: U.S. Congress, Office of Technology Assessment, "Complex Cleanup: The Environmental Legacy of Nuclear Weapons Production," OTA-484 (Washington, D.C.: U.S. GAO, February 1991); and Susan M. McMichael, *RCRA Permitting Deskbook* (Washington DC: Island Press, 2011).
[91] Statement of Secretary of Energy James D. Watkins before the Senate Committee on Energy and Natural Resources, October 5, 1989.

contractors operated these plants was: This is our business, it's national security, everybody else butt out."[92] A study by the Congressional Office of Technology Assessment also asserted that DOE's noncompliance with RCRA was the result of a "history of emphasizing the urgency of weapon production for national security, to the neglect of health and environmental considerations; ignorance of, and lack of attention to, the consequences of self-regulation, without independent oversights or meaningful public scrutiny."[93]

The second issue raised in Congressional hearings on the FFCA was that DOE was unable to provide meaningful oversight of its own activities and EPA could not effectively enforce RCRA at DOE facilities. Prior to the enactment of FFCA, EPA took enforcement action under RCRA differently against federal facilities compared with private parties as a result of the Department of Justice's "unified executive theory." The DOJ's policy, which was drafted during the administration of Ronald Reagan, interpreted the U.S. Constitution to bar EPA from bringing a judicial enforcement action another federal agency on the ground that the "executive cannot sue itself".[94] [95] Furthermore, according to the DOJ's 1987 testimony before the House Subcommittee on Oversight and Investigations, Committee on Energy and Commerce, EPA lacked the statutory authority

[92] Quoted in *Washington Post*, June 17, 1989.
[93] U.S. Congress, Office of Technology Assessment, "Complex Cleanup: The Environmental Legacy of Nuclear Weapons Production," OTA-484 (Washington, D.C.: U.S. GAO, February 1991), pp. 15.
[94] Michael Herz, "United States v. United States: When Can the Federal Government Sue Itself?," William and Mary Law Review 893, Vol. 32, Issue 4 (1991), http://scholarship.law.wm.edu/cgi/viewcontent.cgi?article=1941&context=wmlr.
[95] The EPA itself has also cowed to this view. According to the EPA, "While EPA has broad administrative enforcement authority, it does not have civil judicial enforcement authority to address environmental violations by a federal facility. This limitation stems from the Department of Justice's (DOJ) interpretation of the Unitary Executive Theory, which prohibits one federal agency from suing another agency in federal court." Environmental Protection Agency, "Overview of the Enforcement Process for Federal Facilities," http://www2.epa.gov/enforcement/overview-enforcement-process-federal-facilities.

necessary to issue administrative compliance orders pursuant to RCRA section 3008(a).[96] Finally, even in a case where EPA had enforcement authority, a federal district court questioned the effectiveness of the Agency. *In Colorado vs. United States Department of Army*, Judge Jim Carrigan concluded that "the E.P.A.'s potential monitoring of the Army's Basin F cleanup operation under CERCLA does not serve as an appropriate or effective check on the Army's efforts" without a "vigorous independent advocate for the public interest."[97]

Third, because "unitary executive theory" prevented EPA from suing DOE, regulatory enforcement was often left to the states and public interest groups. However, as previously noted, federal attorneys resisted state attempts to assert regulatory authority at federal facilities based on "sovereign immunity." Perhaps one of the most important examples of this struggle was the State of Ohio's six-year-long attempt to force DOE to remediate its highly contaminated Fernald uranium processing plant. Until 1993, Fernald contractors and the DOE estimated that 299,300 pounds of uranium were released into the air and another 169,974 pounds were released into the water between 1951 and 1988. In 1993, the Center for Disease Control and Prevention analyzed original notebooks rather than summary reports kept at the site and increased the estimate to one million pounds of uranium released into the air and another 217,800 pounds released into the water.[98] The state of Ohio brought a suit against DOE in 1986 after first learning of the extent of the contamination. The suit asked a district court to enjoin the plant from

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[96] Steven A. Herman and Thomas L. McCall, "Final Enforcement Guidance on Implementation of the Federal Facility Compliance Act," EPA Memorandum, EPA-300-B-02-008, July 6, 1993, http://www.epa.gov/compliance/resources/policies/civil/federal/ffcaguide.pdf.
[97] *State of Colo. v. US Dept. of the Army*, 707 F. Supp. 1562 - Dist. Court, D. Colorado 1989.
[98] Tim Bonfield, "Fernald: History Repeats Itself," The Cincinnati Enquirer, February 11, 1996, http://www.enquirer.com/fernald/stories/021196c_fernald.html.

operating in a manner inconsistent with state environmental laws (Fernald did not have a RCRA permit as required by Ohio Solid and Hazardous Waste Act), and for $250,000 in civil penalties.[99] In response to Ohio's request for courts to impose civil penalties under the Clean Water Act and RCRA, the federal government invoked the "sovereign immunity" defense. In *United States Department of Energy v. Ohio*, issued just before the passage of the Federal Facilities Compliance Act, the Supreme Court agreed with DOE's argument that waivers of sovereign immunity present in the CWA and RCRA extended only to procedural fines and not to civil (punitive) penalties.[100]

There was bipartisan agreement in Congress that RCRA needed to be amended to take account of these issues and enforce federal compliance of solid and hazardous waste laws. The Senate passed the FFCA with a vote of 94 to 3, the House passed the Act by a vote of 403 to 3, and the FFCA was enacted on October 6, 1992.[101] Perhaps most importantly, Congress specifically amended RCRA to waive "sovereign immunity" for the federal government with respect to civil fines and penalties, though it did not do so under other environmental laws. Under the FFCA, federal departments and agencies, including the DOE, would henceforth be subjected to injunctions, administrative orders and penalties for noncompliance. Federal employees would also be subjected to criminal sanctions, including fines and imprisonment under any federal or state solid or hazardous waste law. The Act also required DOE to develop a complex-wide inventory of the volume and location of mixed waste around the complex and the capacity for treating mixed waste. It required DOE to submit plans to states and the EPA, and to get approval at each site for cleaning up waste from past nuclear weapons activities, including getting

[99] *Ohio v. United States Department of Energy*, 689 F. Supp. 760 (S.D. Ohio 1986).
[100] *United States Department of Energy v. Ohio*, 112 S. Ct. 1627, 1632 (1992).
[101] *106 STAT. 1505. Pub. L. No. 102-386.* 102d Congress, October 6, 1992.

approval for treating and disposing of mixed wastes containing radioactive and hazardous material. Finally, the FFCA required DOE to enter into legal orders requiring the Agency to comply with approved plans. By specifying fines and penalties for agencies that did not comply with RCRA requirements, the goal of the FFCA was to compel DOE to come into compliance with RCRA provisions as quickly as possible.

With the FFCA's enactment, states were given significant new regulatory and oversight authority over site remediation and management of radioactive and chemically hazardous waste.[102] As a consequence of the FFCA, the DOE also developed a comprehensive waste inventory, giving states information about contamination at their sites. The Act also changed the relationship between states and the federal government with respect to cleaning up the nuclear weapons complex by giving states more leverage in oversight. This included new authority for governors to approve or disapprove waste shipments between states and to sign off on a site treatment plan before implementation.

The FFCA's enactment also changed the relationship between state and federal government in remediation activities in an indirect way. Before passage of the FFCA, some states hosting the largest sites in nuclear complex – such as Washington with Hanford, South Carolina with Savannah River, Tennessee with Oak Ridge and Ohio with Fernald – had entered into "tri-party" agreements with DOE and EPA to address soil and grounder contamination. However, other states with nuclear weapons sites used passage of the FFCA as an opportunity to enter into Federal Facilities Agreements (FFAs) with DOE and EPA. The FFAs combined remediation decisions under RCRA and the Comprehensive Environmental Response, Compensation and Liability Act into a single

[102] National Governor's Association, 'Twenty Years of the Federal Facility Compliance Act: Lessons Learned about the Cleanup of Nuclear Weapons Waste," NGA Paper, September 2012.

agreement, thereby establishing a framework for regulating remediation of a variety of waste types, including mixed waste, legacy waste, waste generating during the remediation itself and contaminated soil and groundwater. Although problematic to achieve, the objective of the FFAs was to create timelines for completing remediation projects with legally enforceable milestones. FFAs continue to provide the basis for ongoing remediation activities.

Despite the goals of the FFCA to establish a more cooperative federalism in the regulation of remediation at nuclear weapons sites, conflicts between states and the DOE over storage and treatment of waste continue. For example, from the perspective of DOE, storage and treatment of wastes destined for the Waste Isolation Pilot Plant in New Mexico are not subject to state regulation. In *Washington v. Spencer*, the DOE contended that the 1996 amendments to the 1992 WIPP Land Withdrawal Act precluded Washington from applying regulations under state law authorized by RCRA to TRU waste bound for Hanford or already stored there.[103]

Central to RCRA's regulatory framework is the permitting process, which imposes detailed requirements on entities that own and operate facilities for the safe treatment, storage, or disposal of hazardous waste, including radioactive mixed waste. Under Section 7004(b) of the Act, Congress granted the EPA broad authority to provide for, encourage, and assist public participation in the development, revision, implementation, and enforcement of any regulation, guideline, or program under RCRA. EPA has used this authority to develop specific public participation activities and all facilities applying for a permit must involve the public in some aspects of the RCRA

[103] S*tate of Washington v. Spencer Abraham, Secretary of Energy, et. al.*, 354 F.Supp.2d 1178, United States District Court, E.D. Washington, January 24, 2005.

permitting process. For example, the public must be notified of the intent to issue or deny a permit or of proposed major modifications to an existing permit.[104] RCRA also provides the public with 45 days to comment on a permit application, and the public may request hearings. In response to concerns that formal public participation began too late in the permitting process and that RCRA permitting information was not always accessible to people, the EPA promulgated the "Expanded Public Participation Rule" in December 1995.[105] Based on recommendations from public interest groups, business trade associations and concerned citizens, EPA revised RCRA's permitting procedures to require, among other things, that applicants "hold an informal meeting" to inform a community before applying for a permit and that the permitting agency "announce the submission of a permit application" so that community members can examine the application when the agency reviews it.[106] In addition, under the Expanded Participation Rule, the permitting agency can require a facility to set up an informational repository or library at any time during the permitting process.

Comprehensive Environmental Response, Compensation and Liability Act, a.k.a Superfund

In 1980, Congress passed the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, a.k.a. Superfund), which amended the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR Part 300), to address growing national concerns about the release of hazardous substances from abandoned waste sites. Under CERCLA, Congress provided broad federal authority to respond directly to releases or potential releases of hazardous substances that may

[104] 40 CFR Part 124.
[105] Expanded Public Participation Rule, 60 FR 63417-34, December 11, 1995.
[106] Environmental Protection Agency, RCRA Expanded Public Participation Rule, December 11, 1995, http://www.epa.gov/osw/hazard/tsd/permit/pubpart.htm.

endanger public health or the environment.[107] Specifically, it provided the Environmental Protection Agency with enforcement authority for cleaning up abandoned or inactive contaminated waste sites and for developing long-term solutions. Section 120 of the Act also granted EPA specific regulatory enforcement and oversight authority for the remediation of hazardous waste sites owned by other federal agencies, such as the DOE. In the case of nuclear weapons complex sites, the DOE is the liable party. The law stresses the importance of permanent remediation remedies and innovative treatment technologies, and it encourages citizen participation in deciding on how sites should be cleaned up. CERCLA was structured to get those responsible for waste problems to clean it up or to reimburse the government for doing so.

CERCLA differs from RCRA in three important respects. While RCRA covers the management and disposal of hazardous waste, including at operating sites, CERCLA governs remediation of contamination or ongoing releases of hazardous substances at closed facilities. Unlike RCRA, CERCLA does not provide for a delegation of regulatory authority to the states, though it does provide that "applicable, relevant and appropriate" state regulations and standards be taken into account. Also, unlike RCRA, CERCLA does directly address hazards of radiation since it is administered by a federal agency.

The application of CERCLA has varied from site to site in the nuclear complex. Under amendments passed in 1986, CERCLA requires an interagency agreement between the facility and EPA for significantly contaminated federal facilities. Often states are signatories to these agreements as well. In addition, requirements of both RCRA and CERCLA can apply at a DOE facility that has both active and inactive waste. The objective of federal facilities agreements (FFAs) was to provide a general framework

[107] Pub. L. No. 96-510, 96th Congress, December 11, 1980.

for how remediation under both laws could be coordinated. However, each agreement was separately negotiated by the DOE facility, the EPA regional office, and, where applicable, the state regulatory agency. Thus, agreements vary from site to site.

At some sites, such as Hanford and Rocky Flats, the DOE has entered into FFAs with the state and EPA that contain provisions aimed at integrating state authority under RCRA and CERCLA decisions. At other sites, such as Weldon Spring, Missouri, states have a more advisory role. Agreements also establish different strategies for coordinating activities under RCRA and CERCLA. For example, the FFA governing the Savannah River Site in South Carolina concentrated on continuing remediation activities that had already begun to meet RCRA's requirements and coordinating CERCLA's requirements with these ongoing efforts. By contrast, at the Idaho National Engineering Laboratory, where remediation plans under RCRA were not as far along, DOE, EPA, and the state elected to give preeminence to remediation procedures under CERCLA.[108]

Congress was clear in CERCLA about its intent for EPA to provide early and meaningful opportunities for residents of affected communities to become active participants in the remediation processes at Superfund sites and to have a say in the decisions that affect their community. Congress was also clear that the EPA should be guided by the people whose lives are impacted by Superfund sites.[109] The intent of the law is restated in the National Contingency Plan:

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[108] Report to the Chairman, Subcommittee on Energy, Committee on Science, Space, and Technology, House of Representatives, "Nuclear Cleanup: Difficulties in Coordinating Activities Under Two Environmental Laws," Government Accountability Office, December 1994, GAO/RCED-95-66.

[109] U.S. Environmental Protection Agency, "Superfund Community Involvement Handbook," (Washington, DC: April 2005), http://www.epa.gov/superfund/community/cag/pdfs/ci_handbook.pdf.

> "(A) Ensure the public appropriate opportunities for involvement in a wide variety of site-related decisions, including site analysis and characterization, alternatives analysis, and selection of remedy;
> (B) Determine, based on community interviews, appropriate activities to ensure such public involvement; and
> (C) Provide appropriate opportunities for the community to learn about the site."[110]

In hearings over the Superfund Amendments and Reauthorization Act of 1986 (SARA), Congress recognized the need for a citizen suit provision in CERCLA.[111] According to the report of the House Public Works and Transportation Committee:

> *"CERCLA is one of only two Federal environmental laws which does not contain a citizens suit provision. The other is the Federal Insecticide, Fungicide and Rodenticide Act. Citizen suits have been found to be helpful both in encouraging diligent Federal enforcement of environmental statutes and in locating and taking actions against violators of these Acts.*"[112]

Although under more narrow conditions than other environmental statutes, the Superfund amendments of 1986 made it possible for citizens to bring suit "against any person (including the United States and any other governmental instrumentality or agency, to the extent permitted by the eleventh amendment to the Constitution) who is alleged to be in violation of any standard, regulation, condition, requirement, or order which has become effective pursuant to [CERCLA]…."[113] Unlike RCRA, which allows citizens to seek injunctions requiring remediation, under CERCLA, citizen can only sue

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[110] National Contingency Plan, Code of Federal Regulations, Title 40, 300.430(c)(2)(ii).
[111] In debates over SARA, some members of Congress, the Department of Justice (DOJ), the Chemical Manufacturers Association and others pressed for either the elimination of or more narrow conditions under which citizens could file suit, arguing that citizen suits would only increase and complicate the litigation load for federal courts, that they would disrupt DOJ and EPA enforcement efforts, and cost delays in cleanup programs. See, for example, Edmund B. Frost, Testimony on behalf of the Chemical Manufacturers Association before the Senate Committee on the Judiciary, United States Senate, on Superfund Authorization, June 10, 1985; and Phillip D. Brady, Letter to Hon. Strom Thurmond, Chairman of the Senate Judiciary Committee, U.S. Department of Justice Office of Interlegislative and Intergovernmental Affairs, May 10, 1985.
[112] Report of the House Committee on Public Works and Transportation on the Reauthorization of Superfund, 99th Congress, First Session, 1985.
[113] CERCLA § 310(a)(1), 42 U.S.C. § 9659(a)(1).

for enforcement of CERCLA's remediation standards. That is, under CERCLA, citizen suits cannot compel remediation, but citizens can file suit to ensure that ongoing remediations meet CERCLA standards.

National Environmental Protection Act

The National Environmental Protection Act (NEPA) of 1969 committed the government to pursue a comprehensive policy of environmental protection. Title 1, Section 101 of the bill provides a congressional declaration of environmental national policy that is also, in essence, a statement of values:

> It is the continuing policy of the Federal Government, in cooperation with State and local governments, and other concerned public and private organizations, to use all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans.

Section 101 enumerates six specific aspects of national environmental policy for which the federal government has responsibility to carry out using "all practicable means":

1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
2) assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings;
3) attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;
4) preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity and variety of individual choice;
5) achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and
6) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

Congress also recognized "that each person should enjoy a healthful environment and that each person has a responsibility to contribute to the preservation and enhancement of the environment."[114]

NEPA requires all federal agencies to consider the environmental impacts of proposed actions before selecting among alternative approaches. In developing a national environmental policy in the preceding years, Congressional staff and other experts had noted the need to include an action-forcing provision in order to compel federal agencies to pay attention to the substantive provisions in Section 101 and to implement them.[115] Thus, the concept of including an environmental impact statement (EIS) in NEPA was introduced during the only Senate hearing on the legislation, which occurred on April 16, 1969 in the Committee on Interior and Insular Affairs. As Senator Henry M. Jackson, the principal Senate sponsor of NEPA, stated at the hearing on the bill, "What is needed in restructuring the governmental side of this problem is to legislatively create those situations that will bring about an action-forcing procedure the Departments must comply with. Otherwise, these lofty declarations are nothing more than that."[116]

Congressional sponsors of the legislation sought to correct the tendency of federal agencies toward single-minded pursuit of development objectives with inadequate information and little attention to side effects or unintended consequences.[117] Section 102 of the bill mandated a careful and informed decision-making process. Congress thus sought to engage federal agencies in a thoughtful and comprehensive planning process to

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[114] National Environmental Policy Act of 1969, Public Law 91-90, 42 U.S.C. 4321, Title 1, Section 101.
[115] Lynton Keith Caldwell, *The National Environmental Policy Act: An Agenda for the Future* (Indiana University Press, 1998), p. 29.
[116] Hearings on S. 1075, S. 237, and S. 1752 Before the Senate Committee on Interior and Insular Affairs, 91st Congress, 1st Session, 116 (1969).
[117] Caldwell, p. 49.

ensure that the nation's environmental goals would inform policy choices.[118] The law requires federal agencies to prepare an EIS for every proposed major federal action that may have a significant impact on the environment. Congress sought to ensure that the processes of environmental impact and assessment would serve to provide the public with an opportunity to learn about and comment on major federal actions, and NEPA gives citizens the right to sue federal agencies if they fail to meet procedural requirements.

However, implementing NEPA has been a particular challenge to the DOE. Although NEPA applied to the DOE and its predecessor agencies, DOE has had poor record of compliance at its defense nuclear facilities.[119] Environmental review required under the law has been substantially after-the-fact and DOE has been criticized for practicing superficial NEPA review. As discussed earlier, the 1980s proved a critical decade as growing concerns about safety and environmental problems forced DOE to shut down various sites in the nuclear weapons complex. The shutdowns were initially expected to be temporary, but several facilities were closed permanently following the end of the Cold War and the dissolution of the Soviet Union. Concomitantly, EPA and state regulatory agencies also began enforcing environmental regulations at DOE's defense nuclear facilities.

Following the end of the Cold War, NEPA, and in particular the EIS requirement under the law, became an important vehicle for public interest groups and the public to engage in important public policy decisions about the restructuring of the nuclear weapons complex. Changing missions at DOE nuclear weapons facilities required NEPA

[118] National Academy of Public Administration, "Managing NEPA at the Department of Energy: A Study for the Department of Energy" (July 1998), p. 5, http://energy.gov/sites/prod/files/G-Oth-Managing_NEPA_DOE.pdf.
[119] Congressional Research Service, "NEPA Compliance at Department of Energy Defense Production Facilities," (Washington, DC: Library of Congress, 1990).

reviews of proposals and alternatives. However, as a 1998 National Academy of Public Administration study noted, "Growing public awareness of the environmental legacy of nuclear weapons production contributed to heightened public distrust of the department and its proposals."[120] As more information about the environmental legacy of the nations' nuclear weapons program was revealed, public scrutiny of DOE actions increased and the DOE found itself the defendant in several lawsuits.

Regulatory Dynamics of Complex Remediation in Perspective

This chapter has provided an overview of the federal statutes that govern remediation at federal defense nuclear facilities. The Atomic Energy Act, the Resource Conservation and Recovery Act, the Comprehensive Environmental Response, Compensation and Liability Act, and state laws and regulations all play a role in the regulatory framework. Through its Environmental Assessments and Environmental Impact Statement processes, NEPA has also provided important mechanisms for oversight of the DOE and remediation.

Regulatory dynamics of environmental laws governing remediation at defense nuclear facilities have had some unintended consequences and produced a labyrinthine regulatory framework that has affected the way in which state and local officials, public interest groups and communities participate in remediation decisions and processes. The laws have prevented states from taking a more prominent role. They have also created problems in overlapping authorities between federal agencies and between federal and state agencies. Overlapping authorities, for example, have created disputes between DOE and its contractors, EPA and state governments over remedies, actions and strategies for remediation at individual sites. Both EPA and the states have asserted their regulatory

[120] National Academy of Public Administration, p. 13.

authority under RCRA and CERCLA, leading to duplicative efforts and confusion about who is in charge. Many sites are subject to agreements entered into by DOE, EPA and relevant state regulatory agencies to address remediation responsibilities under RCRA and CERCLA; each of these agreements has generated a list of requirements and deadlines, but the most pressing issues at the site are often not addressed. Instead, remediation efforts have often focused on the less technically challenging issues that can be completed sooner. Furthermore, the agreements do not include nuclear safety issues since they are not covered by RCRA or CERCLA authority. For example, the Hanford Tri-Party Agreement was criticized as unworkable because it had arbitrary schedules for completing projects, it failed to recognize the importance of nuclear safety and the DOE's responsibilities under the AEA and it didn't provide a framework for prioritizing work at the site.[121]

Overlapping authorities resulting from multiple statutes have also led to inefficiencies and mismanagement. As a result of more intense scrutiny by Congress, the media and the public in the 1980s, the DOE became more conservative in interpreting regulatory requirements and its own orders, but it also placed greater reliance on its contractors in determining how to implement these requirements and orders. According to one study, "Combined with a lack of sufficient properly trained contract managers and the prevailing use of cost-plus contracting mechanisms (which create financial incentives to increase costs of compliance), DOE's overconservative approach has led to substantial inefficiencies and unnecessary costs in complying with environmental-protection and

[121] Katherine N. Probst, Carolyn A. Pilling, and Karen T. Dunn, "Cleaning Up the Nuclear Weapons Complex: Exploring New Approaches," Resources for the Future, Discussion Paper 96-25, Washington DC (July 1996), p. 17-18.

nuclear-safety requirements."[122] Lack of agreement among multiple regulators has slowed regulatory compliance as contractors attempt to attain a consistent decision and has led to more resources expended to coordinate decisions. Different objectives of multiple regulations have also inhibited priority-setting.[123]

In addition to the complexity of environmental remediation at the sites, oversight of DOE is also difficult because the regulated entity is a federal agency and because of the key role of contractors. Some 90 percent of the DOEs budget is spent on contracts.[124] Contractors are not signatories to the remediation and compliance agreements, but they are signatories with the DOE for permits under RCRA, the Clean Air Act and the Clean Water Act. Environmental Management at DOE currently employs more than 30,000 contractor employees, including scientists, engineers, and hazardous waste technicians.[125] The low ratio of federal employees overseeing contractors also allows contractors to pursue remediation projects that may not be the highest priority.

DOE has long been accused of poor oversight of its environmental remediation contracts and oversight of contractor activity. Most environmental remediation is concentrated among a few large contractors. According to a Congressional staff memo, these contractors refer to themselves as "competimates", "meaning that they may be competitors for one project, but joint venture teammates on another… Contractors outside this circle have complained that the Department is not open to working with new

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[122] Committee to Evaluate the Science, Engineering, and Health Basis of the Department of Energy's Environmental Management Program, National Research Council, "Improving the Environment: An Evaluation of the DOE's Environmental Management Program," p. 35, National Academy Press (Washington, DC: 1995), http://www.nap.edu/catalog/5173.html.
[123] National Academy Press (1995), p. 37.
[124] Government Accountability Office, "High Risk Series: An Update," February 2013, GAO-13-283, http://www.gao.gov/products/GAO-13-283.
[125] Project Management, US Department of Energy, http://energy.gov/em/services/program-management/project-management.

parties."[126] DOE contracts have been written in ways that give contractors little incentive to reduce costs, limit the scope of activities or to bring projects to completion. Instead, contractors have every incentive to assure continued flow of money to remediation sites. Unlike a private regulated facility, which has every reason to fight for less costly alternatives, at federal facilities contractors stand to benefit from high annual expenditures. Contractors also have the incentive and ability to obscure the true cost associated with site activities. Because they are federal facilities, Congress decides how much money is appropriated for environmental compliance. Regulators must take into account the costs for compliance, which especially affects states whose roles in remediation are essentially limited by the federal budget.

Numerous interviewees asserted that the environmental management program is just "more gravy for contractors." "Cleanup" and "modernization" have continued to flow large sums of money into the DOE enterprise, and progress on cleanup is equated to how much money is spent on the environmental management program, not how well it is being spent. The program is contractor run and Congress is not doing its job to investigate whether the system is working as well as it should. Several independent and government reports have noted that inscrutable budget allocations and accounting processes, practices inherited from the legacy of historic secrecy and self-regulation of DOE and its predecessor agencies, only compound problems resulting from the lack of

[126] Majority Staff, Memorandum to the Subcommittee on Financial and Contracting Oversight, Hearing on Contract Management by the Department of Energy, June 27, 2013, http://www.mccaskill.senate.gov/imo/media/doc/DOEContractManagementMemo20130626.pdf.

effective internal and external accountability and regulation of the facilities and activities at nuclear weapons complex sites.[127]

Conclusion

Throughout the Cold War, the national security mandate of the nuclear weapons complex trumped all other concerns. The DOE carried out its mission in a political void, absent Congressional, media and public scrutiny. Environmental pollution and threats to worker and public health and safety, byproducts of nuclear complex's primary task of weapons production, received scant attention. Although legislation passed by Congress sought to establish means for protecting health and the environment and to open up decision-making processes to the public, the DOE claimed immunity. With the end of the Cold War, the environment that had walled off the nuclear complex from pressures for accountability began to change.

The history of the regulatory dynamics of the nuclear weapons complex serves as an example of the tension between the administrative state with its focus on managerialism and expertise, and the rise of pluralism with its focus on transparency and accountability in a democratic system. The Atomic Energy Act greatly increased the influence of the federal government, particularly through its goal of maximizing national

[127] U.S. Department of Energy, "Report of the Department of Energy Working Group on External Regulation," (Washington, DC: DOE, December 1996); U.S. Government Accounting Office, Process to Remove Radioactive Waste from Savannah River Tanks Fails to Work," (Washington, DC: GAO/RCED-99-69, April 1999; U.S. Nuclear Regulatory Commission, "External Regulation of Department of Energy Nuclear Facilities: A Pilot Program" (Washington, DC: Nuclear Regulatory Commission, NUREG-1708, July 1999). A report by Resources for the Future observed in 2000 that "those who do try to shine a light on the EM budget are largely unsuccessful, as there are so many more powerful stakeholders lobbying to maintain site budgets and local employment. The result is a lack of scrutiny that has now gone on for more than a decade." Kate N. Probst and Adam I. Lowe, "Cleaning up the Nuclear Weapons Complex: Does Anyone Care?" (Washington, DC: Resources for the Future, January 2000), p. 8, http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-RPT-nuclearweap.pdf.

security. However, the managerialism appropriated to the DOE and its predecessors through the national security mandate under the AEA has been characterized by secrecy. Revelations over the decades of the effects of the nuclear weapons production cycle have raised questions about whether the federal government and its contractors have acted to minimize the long-term risks to the environment and human health, and therefore whether they have acted in the public interest. The new environmental laws of the 1970s that called for pluralism and increased public participation were intended to serve as a challenge to the administrative state with its managerial approach to policymaking. The tension between national security administrative regime and public interest pluralist regime especially came to a head with the end of the Cold War as missions began to change at nuclear weapons sites.

Remediation at defense nuclear facilities has raised the question of whether bureaucratic agencies and their contractors can be trusted to ensure public and environmental welfare. Given the history of environmental contamination and threats to public health discussed in this chapter, from the perspective of Congress, interest groups and the public, the answer to this question is often "no." Congress intended the laws discussed in this chapter to serve as a means to foster pluralism by expanding access to government information and decision-making, and to counter the inherent secrecy surrounding the nuclear complex through increased public participation in environmental remediation. In practice, decision processes and forums do not guarantee true engagement and dialogue between the public, interest groups, and DOE and its contractors. At many, though not all, of the defense nuclear sites, DOE and regulators follow a "check-the-box" approach to public participation, issuing notices and allowing

for public comment. In some cases, "public participation" has been limited to no more than the dissemination of information. The EPA itself has acknowledged that "some of the most meaningful and informative involvement for citizens may come through activities not organized by permitting agencies or regulated facilities," but rather through informal channels such as public interest groups and citizen-to-citizen engagement in communities.[128] Indeed, one EPA official commented in an interview that non-regulatory public participation has been more important than legislatively-mandated public participation because formal opportunities for participation present the public with decisions that have already been made and "folks feel left out."[129] Presenting pre-made decisions for public reaction can undermine legitimacy of decisions and help to foster public distrust of agencies.

In the wake of the Cold War, a more intensely popular democratic view has risen, challenging both the administrative and pluralist views of governance. Although NEPA, CERCLA and RCRA and other environmental laws of the 1970s and 80s that legally require public participation are sometimes the only leverage communities have to impact environmental and health decisions, community and grassroots groups around defense nuclear facilities have noted that these pluralist laws passed by Congress are a "mixed bag." These groups make a distinction between "engagement" and "participation," noting that participation as required by the laws can be rather superficial under some circumstances.[130] For example, groups note that the government and contractors consider

[128] Environmental Protection Agency, "RCRA Public Participation Manual," EPA 530-R-96-007, September 1996. See also: Environmental Protection Agency, "EPA Guidance and Policy for Community Involvement," http://www.epa.gov/superfund/policy/remedy/sfremedy/cominvolve.htm.
[129] Interview with author.
[130] Interviews with author.

it participation when they simply release documents that contain pertinent information to decisions that might affect the health and environment of a community. Groups would prefer instead that government entities and contractors educate the public with pertinent information and dialogue with the public to reach the most desirable outcome for the health and environment of that community. Because the laws do not always make true public engagement possible, communities are often at a disadvantage in terms of their ability to affect decision processes and outcomes.

From the view of grassroots and community organizations, communities are more greatly under-resourced in terms of their ability to engage in decision-making processes and forums compared to the ability of state and federal agencies and corporate entities. Grassroots groups argue that most federal and state agencies are captive and beholden to companies contracted to do the environmental remediation work, rather than being accountable to the communities they are meant to protect and serve. From the perspective of these groups, NEPA, CERCLA and RCRA are important, but they require a significant investment of time and energy, which individuals in the public do not have.

The public is not always included in remediation decisions and processes because DOE and its contractors do not consider it expert enough. Grassroots and community groups also note that it has been difficult to sustain the attention of the public as remediation issues have become more technical and because there has not been sustained media attention to the issues. Public interest groups have played an important role in providing expertise, but their work is limited by the amount of access they have both to information and participatory forums.

The following chapters provide a more in-depth examination of the rich interplay between regulation and participation through case studies of organizations based at different nuclear complex sites around the country, and the efforts of these organizations to monitor and participate in environmental remediation throughout the nuclear weapons complex. In particular, the work of these organizations focuses on educating the public about environmental and technical issues and getting the public involved in remediation decisions.

Chapter Three: The Grassroots Movement for Openness and Nuclear Accountability

A real awakening about the health and environmental legacy of the Cold War occurred in communities by the mid-1980s as people discovered there was radioactive and chemical contamination in their backyard. The case of Fernald, discussed in detail in chapter four, is an exemplar. A local resident, Lisa Crawford, came home one day in 1984 to find the representatives of the Department of Energy (DOE) climbing out of her water well. They were there to test for uranium contamination. Concern on the part of Crawford and other residents living near the Fernald nuclear site whose wells were also contaminated led to the creation of a local grassroots organization, the Fernald Residents for Environmental Health and Safety (FRESH). In order to press for the release of information about the extent of contamination at the site, the neighbors brought a lawsuit against DOE's site contractor that was settled with DOE for $73 million and included medical monitoring and testing.

Before learning her well was contaminated, Crawford was a working mom raising her son. She had no formal political training, nor did she know anything about the legal system or environmental laws. She had never even been on an airplane before she went to her first meeting of the Military Production Network/Alliance for Nuclear Accountability (MPN/ANA). However, Crawford was incredibly savvy and quickly learned what to do to raise public attention about the issues and to hold DOE and politicians accountable. Through MPN, she met others who were facing similar issues in their communities. MPN provided political and technical training to Crawford and its other member organizations. The network also served as a resource to connect with experts, like Bob Schaeffer who provided political and media training, and Dr. Arjun Makhijani who provided technical

expertise to local groups. Crawford and FRESH received help in terms of understanding the politics of cleanup, that is how to flex their political muscle to attain better environmental and health outcomes for their community.

FRESH served as a model for other groups across the country about how to demand participation in decision-making processes regarding remediation at their site. And when it came to deciding "how clean is clean" at Fernald, FRESH was a model for understanding that there is no such a thing as someplace else to get rid of waste. Like other MPN/ANA groups, FRESH understood that every place is someone else's backyard and their perspective changed the course of remediation at Fernald. By sharing stories from communities across the country, FRESH helped the community and the site reach the so-called "balanced approach," in which Fernald kept the higher volume, lower concentration radioactive waste and shipped the lower volume higher concentration waste offsite, about a ratio of 80 percent to 20 percent. By doing so, it saved hundreds of millions of dollars in remediation costs and propelled the remediation process forward.

FRESH also transformed the relationship with workers who initially did not want the site shut down because they viewed it as an economic engine. Workers resisted the neighbors' lawsuit, but after the neighbors settled with DOE and once workers understood that the contamination affected their health, they filed their own suit, eventually settling with DOE for $15 million and medical monitoring. During a union strike one day, Crawford took White Castle hamburgers and coffee to workers and joined the picket line. She befriended workers and vowed to take on the issue of ensuring workers would have jobs as the site entered remediation processes. Like other groups across the country, FRESH has never really received the level of attention it deserved for

holding federal agencies to account for environmental contamination and threats to public and worker health and safety and for demanding public participation in the remediation process.

Although exemplar, FRESH is just one of some three dozen organizations downwind and downstream from DOE nuclear weapons research, development, testing and production facilities that are members of what is now called the Alliance for Nuclear Accountability (ANA), but was established as the Military Production Network (MPN). Many member organizations were founded in the late 1970s to early 1980s as grassroots community and public interest organizations concerned about the toxic environmental and health legacy of nuclear weapons facilities in their backyard. However, these groups were working largely in isolation at individual facilities, with few resources to challenge federal agency policies and practices. In 1987, a movement of these grassroots organizations coalesced to form a network to counter the historic secrecy and self-regulation at DOE and its predecessor agencies, arguing that such practices are not tolerable in a free and democratic society. The network charged that government agencies had consistently withheld information from the public about radioactive releases, whether planned, routine or accidental. The network also charged that the damage to environment and to health of the workers and the public represented a "profound breach of trust with the people of the United States."[131] For nearly three decades, MPN/ANA has demanded public participation in health safety and environmental decisions at DOE sites, and advocated major reforms to federal and state laws, and to practices in federal agencies to increase what it terms the "fundamental rights" of public safety, environmental quality, government accountability and due process.

[131] Alliance for Nuclear Accountability, "Policies and Procedures," May 1998, updated 2012.

The movement for openness, accountability and environmental justice can be usefully viewed as what Frank R. Baumgartner and Bryan D. Jones have termed a mobilization under a wave of criticism to challenge the political order.[132] Drawing on work by Anthony Downs and E.E. Schattschneider, Baumgartner and Jones have demonstrated that new actors can be mobilized into politics either during a wave of positive feedback (enthusiasm) or a wave of negative feedback (criticism), and each type of mobilization leads to different policy outcomes. A wave of positive feedback leads to the buildup of a policy subsystem, which is a type of institutional arrangement that can promote stability so long as the subsystem can insulate itself from new policy ideas and competitors. Positive images or perceptions of issues are associated with waves of enthusiasm and they encourage delegations of power to experts and system insiders. Only program supporters are organized and there is no organized opposition. Proponents try to insulate themselves by designing new laws, institutions and procedures that structure participation and ensure privileged access to supporters. Baumgartner and Jones assert, however, that the stability of policy outcomes under this system remains fragile because it depends on the existing structure of political institutions and the definition of the issues processed by those institutions. A change in political institutions or the definition of the issues can lead to dramatic policy change.

Instability and change can occur when forces mobilize to challenge the subsystem. Waves of criticism are marked by increasingly negative policy understandings. Opponents organize against the status quo and attempt to redefine the issue by highlighting the negative aspects of the program. During waves of criticism,

[132] Frank R. Baumgartner and Bryan D. Jones, *Agendas and Instability in American Politics* (Chicago: University of Chicago Press, 1993).

more groups mobilize for political action and other institutions become involved, destroying the policy consensus that had sustained the subsystem. Intense criticism gives new policymakers an incentive to claim jurisdiction over the issue. Criticism is directed not just at the substance of policies, but also at the institutions and procedures that make them possible. Mobilizations under waves of criticism are also marked by institutional turbulence, which can lead to subsystem destruction and dramatic policy change. According to Baumgartner and Jones, periodic institutional changes "can explain why policies may be relatively stable during long periods while the institutions are stable, but then change dramatically during periods when the institutional revisions occur."[133]

John Kingdon has shown that a "focusing event," such as crisis, revelation of misconduct or incompetence among government actors can also help facilitate the flow of information.[134] If enough information becomes public, it can help to redefine issues and shift the nature of the debate. How the issues are defined, in turn, can help explain how forces are mobilized within a policy sector. Furthermore, "shaping popular perceptions" about issues are key to "creating a public" or attracting attention, according to Christopher J. Bosso.[135]

As discussed in chapter two, the Department of Energy (DOE) and its predecessor agencies operated the nation's nuclear weapons program in secrecy. Throughout the Cold War, issues related to the nuclear weapons complex were defined in terms of "national security," limiting the number of decision-makers in the program. DOE and its predecessor agencies used the rubric of "national security" to claim "sovereign

[133] Baumgartner and Jones, 1993, p. 89.
[134] John W. Kingdon, *Agendas, Alternatives and Public Policies* (Boston: Little, Brown, 1984) p. 100.
[135] Christopher J. Bosso, *Pesticides and Politics: The Life Cycle of a Public Issue* (Pittsburgh: University of Pittsburgh Press, 1987) p. 80.

immunity" from environmental, health and safety oversight and regulation. In addition, because of the scientific and technological complexity related to nuclear weapons research, development and production, only a small group of experts were considered qualified enough to participate in decisions, which also contributed to limiting the number of decision-makers and insulating the DOE from outside regulation. Thus, throughout the Cold War, decisions about nuclear weapons policies and programs were made in a political void.

For some forty years, the institutional arrangements guarding the nuclear weapons program were remarkably stable. DOE and its predecessor agencies maintained a policy monopoly over nuclear weapons until the late 1980s and early 1990s, even though the agency had been forced to open up nuclear energy to regulation by the mid-1970s.[136] Dramatic change with regards to the nuclear weapons complex occurred as a mobilization under wave of criticism against DOE policies and practices began in 1980s as extensive health, safety and environmental pollution problems were revealed under intense media and public scrutiny, and Congressional inquiry. These three factors were mutually reinforcing and raised public consciousness about the legacy of the nuclear weapons complex. The MPN/ANA thus mobilized under a wave of criticism of DOE. The network contributed to redefining nuclear weapons issues in terms of the legacy of their negative environmental costs and the threats they posed to the health and safety of workers and the public. MPN/ANA also contributed to policy change at DOE to include the public in the decision-making processes with regards to environmental remediation and waste management.

[136] Robert J. Duffy, *Nuclear Politics in America: A Theory of Government Regulation* (Kansas: University of Kansas Press, 1997).

In this chapter I trace the historical factors that led to founding of MPN/ANA and the role the network has played in empowering communities impacted by the nuclear weapons complex. Comprised of concerned, committed and talented grassroots community groups, MPN/ANA was at the forefront of the environmental justice and openness movement. It is unique in that it is a self-sustaining, horizontal network of grassroots organizations dedicated to increasing consciousness about environmental, public and health safety issues at DOE nuclear weapons facilities. As a grassroots movement organized around these issues, it has not been coopted by those within the political system, though it does work with allies in Congress, regulatory agencies and the media. I discuss how the network mobilized to change the direction of historic self-regulation and secrecy at DOE. The work has been an uphill battle given the complexity of the issues and given that DOE is an entrenched bureaucracy in which roughly 90 percent of the workforce is comprised of contractors. Nonetheless, the network has had some success, particularly in using environmental and information laws to obtain information and expose problems, in pressing for greater public participation in decision-making, and in constraining the ability of DOE to modernize the nuclear weapons complex or produce new nuclear weapons before it has fulfilled its obligations to address the health and environmental legacy of the Cold War.

Domestic and International Focusing Events

The founding of MPN/ANA coincided with intense scrutiny of environmental contamination and health and safety concerns by Congress and the media, and the end of the Cold War. Combined, these factors contributed to revelations about the extent of contamination and threats to public and worker health and the opening of decision-

making processes with regards to remediation and waste management at nuclear weapons facilities. Several domestic and international events beginning in the early 1980s were instrumental in creating a window of opportunity to press for greater information about the legacy of nuclear weapons testing and production and to press for accountability at DOE. President Ronald Reagan's nuclear buildup not only sparked wide domestic opposition from the peace and disarmament movement, it also catalyzed opposition on environmental grounds.[137] Environmental activists began to make the link between nuclear weapons and the environment around 1981. In a sensitive 1981 report titled "Some Political Aspects of Special Nuclear Materials Production," DOE analyst A.T. Peaslee, Jr. asserted that repairs and restorations needed by defense nuclear reactors could be considered major federal actions as defined by the National Environmental Policy Act and therefore would require an environmental impact statement for public comment. Restarting defense production "reactors could be hindered by lawsuits until the adequacy of the EIS is acted on by the courts….changes in the defense production reactor complex may trigger intervenor actions based on environmental impact."[138] Peaslee warned the Reagan Administration that if the agency had to comply with commercial nuclear safety and environmental protection laws it "can be expected to result in the effective curtailment of defense production reactor activities" in America.[139] According to Robert Alvarez, an environmental activist who later served on the staff of Ohio Senator John Glenn at the Senate Committee on Government Affairs and then at DOE during the

[137] On the peace and disarmament movement, see: Lawrence S. Wittner, "The Nuclear Freeze and Its Impact," Arms Control Association, December 2012, https://www.armscontrol.org/act/2010_12/LookingBack.
[138] A.T. Peaslee, Some Political Issues Related to Future Nuclear Materials Production, Los Alamos National Laboratory, LA-8969-MS, August 1981, http://www.osti.gov/scitech/servlets/purl/6052534.
[139] A.T. Peaslee, August 1981.

Clinton administration, "The linkage that we started to understand was that we could control the arms race by controlling the waste they dumped."[140] Environmental activists began to employ the "polluter must pay" tactic to press for internalizing costs of the weapons programs that had previously been externalized.

By the 1980s, America's crumbing nuclear weapons complex infrastructure was on a collision course with the nation's environmental ethos. Information from a whistleblower at Oak Ridge in 1983 led to Freedom of Information Act (FOIA) inquiries by the media and the Legal Environmental Assistance Foundation. The FOIA inquiries led to DOE disclosures that two million pounds of mercury from the Y-12 plant was lost or unaccounted for and a significant portion of the inventory was released into the environment between 1950 and 1977.[141] Subsequently, the Legal Environmental Assistance Foundation and the Natural Resources Defense Council took the agency to court. *LEAF v. Hodel* case was the first time the courts enforced environmental laws on the DOE and ruled that the nation's nuclear weapons program could not claim exemption from the nation's toxic waste dumping regulations under the Resource Conservation and Control Act (RCRA). Prior to the *Leaf vs. Hodel* decision the nuclear weapons program was subject to NEPA and was required to perform environmental impact statements that proved to be informative.[142] Nuclear weapons plants had been constructed when the environmental laws didn't yet exist, so until the ruling, they had been isolated from the mainstream of industry that was required to comply with environmental laws.

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[140] Interview with author.
[141] ChemRisk Report to the Tennessee Department of Health, "Mercury Releases from Lithium Enrichment at the Oak Ridge Y-12 Plant: A Reconstruction of Historical Releases and Off-Site Doses and Health Risks," Reports of the Oak Ridge Dose Reconstruction, Vol. 2, July 1999, https://health.state.tn.us/ceds/OakRidge/Mercury1.pdf.
[142] *Legal Environmental Assistance Foundation v. Hodel*, 586 F. Supp. 1163 (E.D. Tenn. 1984).

In addition, the passage of the 1982 Nuclear Waste Policy Act set forth a process to define and develop a permanent national repository for radioactive waste. The Reagan administration had decided that the repository could comingle spent nuclear fuel from domestic nuclear reactors with high-level waste from the nuclear weapons program, which was mostly reprocessing waste, so there would only be one site. By 1983, DOE began to start putting pins on a map for possible waste sites, identifying nine sites in six states. By 1986, the sites narrowed to Hanford, Washington, Yucca Mountain, Nevada and Deaf Smith County, Texas. The naming of potential sites contributed to waking people up about the toxic legacy of the nuclear weapons program. As there was national discussion about nuclear waste, states like Ohio, Washington and South Carolina began to realize that bomb plants had left behind an unquantified legacy and they started to become more concerned with what was in their own backyards.

International events also greatly impacted growing concerns about the nation's nuclear weapons complex. Anxiety about the April 26, 1986 Chernobyl nuclear disaster in Russia drew attention to the aging and deteriorating domestic nuclear weapons complex. Nine days after the Chernobyl nuclear reactor exploded, radioactive contamination reached the Pacific Northwest and was detected in rainfall. The disaster spurred national media attention and Congressional inquiry because there were disturbing institutional and technological similarities between the Chernobyl reactor and the American nuclear weapons reactors at Hanford and the Savannah River Site. Independent experts like Dr. Arjun Makhijani and Robert Alvarez used the Chernobyl disaster to spotlight that the nuclear production reactors in Hanford, Washington and Savannah River Plant, South Carolina also didn't have containment domes. Of particular concern

was the N-Reactor at Hanford, which, like Chernobyl No 4, was moderated by graphite and cooled by water. Experts questioned whether there were sufficient safety mechanisms at American production reactors to prevent a similar disaster since Hanford and Savannah River Site did not meet commercial nuclear safety standards.[143] The Chernobyl disaster increased pressure from within government to get more information about the nation's nuclear weapons complex. One result was that the National Academy of Sciences conducted the first independent health and safety assessment of DOE and produced a highly critical, 67-page report that amounted to an indictment of the agency's oversight. The NAS noted the acute aging of the weapons reactors and charged that DOE's safety oversight was "ingrown and largely outside of the scrutiny of the public."[144]

By the mid-1980s, members of Congress, especially Senator John Glenn, became more concerned about the safety and environmental problems at the nation's nuclear weapons facilities. Revelations in late 1984 about uranium releases at the Fernald Feed Materials Production Plant in his own state focused Senator Glenn's attention and he was instrumental in raising the issues to national prominence. Senator Glenn was generally conservative and definitely pro-military; he had served in World War II and in Korea. This gave him more authority in scrutinizing DOE because they couldn't red bait him. Senator Glenn would often genuinely ask "what good is it to defend ourselves with nuclear weapons if we poison ourselves in the process."[145] Senator Glenn's office commissioned numerous General Accounting Office (now the Government Accountability Office) reports on health, safety and environmental issues at nuclear

[143] Interviews with author; *U.S. News & World Report*, Volume 102, (U.S. News Publishing Corporation, 1987), p. 78.
[144] National Academy of Sciences, National Research Council, "Safety Issues at Defense Production Reactors," 1987.
[145] Robert Alvarez interview with author.

weapons facilities. In total, the GAO produced some 21 reports between 1979 and 1987. When he assumed chairmanship of the Senate Committee on Government Affairs in 1987, Senator Glenn began holding hearings to expose the extent of environmental contamination and health and safety violations across the nuclear complex. Senator Glenn consistently asked how big the mess was and how much it was going to cost to address it. Beginning in 1987, Senator Glenn championed legislation that would impose some kind of external oversight or regulation over DOE operations, which eventually resulted in the creation of Defense Nuclear Facilities Safety Board.[146]

When Robert Alvarez joined Senator Glenn's Committee staff in 1988, he was charged with the crusade to get more information about environmental and safety problems across the complex. Alvarez helped found the Environmental Policy Institute, a respected national public interest organization, in 1975 and in his work there he helped enact several federal environmental laws, wrote several influential studies and organized successful political coalitions. He helped organize a successful lawsuit on behalf of the family of Karen Silkwood, a nuclear worker and active union member who was killed under mysterious circumstances in 1974. His experiences outside of government uniquely qualified him to scrutinize DOE from within Congress. As he obtained information in his Congressional staff capacity, Alvarez passed along information he thought would make good headlines to reporters to draw attention to the issues.

Beginning in the late 1980s, DOE made several admissions about extent of contamination and the cost to clean it up in hearings and through investigations. Energy Secretary John S. Herrington and Undersecretary Joseph Salgado were appalled at what

[146] Defense Nuclear Facilities Safety Board, 25th Annual Report to Congress, March 2015, http://www.dnfsb.gov/sites/default/files/Board%20Activities/Reports/Reports%20to%20Congress/2015/ar_2015311_26486.pdf.

was going on inside the agency and at some sites. According to Robert Alvarez, "Some people at DOE were frustrated with the system and they went out of school to share information. In preparation for one hearing in 1988, I asked a DOE witness if they could look at whether Savannah River Site had any accidents or near misses. Four days later, I received a fax copy of a memo from DuPont that listed them all and I alerted the press."[147]

Part of the rationale for being more forthcoming about failures and long-standing problems across the complex was that the DOE was making a case to the Reagan administration and Congress for more funds to modernize the nuclear weapons complex during a time of financial austerity.[148] Undersecretary of Energy Joseph Salgado testified in hearings in 1988 on the nuclear weapons program held by the Senate Committee on Government Affairs and the House Energy and Commerce Subcommittee on Hazardous Materials where he admitted that DOE nuclear weapons sites could cost $100 billion to remediate and contain the radioactive and hazardous wastes at nuclear facilities, which differed substantially from his testimony in Senate hearings the previous year that put the estimate at anywhere from $2 billion to $12 billion. At the time, the $100 billion estimate took people's breath away, but Senator Glenn's staff thought it was a low-ball estimate, and they have proven to be correct.[149] In July 1988, Salgado delivered a study he had promised in 1987 detailing environmental conditions to the Senate Committee on Government Affairs chaired by Senator Glenn and told the committee that environmental

[147] Interview with author.
[148] Randolph Ryan, "A Planned Crisis?," *Boston Globe*, October 21, 1988, http://www.highbeam.com/doc/1P2-8084496.html.
[149] According to Robert Alvarez, Senator Glenn though the DOE would need $5-6 billion per year until the contamination was remediated and contained. The Environmental Management budget has been roughly $5-6 billion per year since the office was established in 1989. Interview with author.

issues represented a "major challenge to the Department, Congress and the Nation … [requiring] a significant investment over a long period of time."[150] By early 1989, DOE put the estimate at $100-$200 billion. Alvarez observed that Senator Glenn's dedication to uncover the health and environmental issues at DOE and to call for accountability was an important contributing factor to the formal establishment of DOE's cleanup program in 1990.[151]

In addition to greater Congressional scrutiny, the media also began to investigate and publicize findings about problems across the nuclear complex. Because of the shroud of secrecy, there were not many national news investigations into sites until the late-1980s. Prior to the mid-1980s, local and regional papers, including the *Cincinnati Enquirer*, Seattle *Post-Intelligencer*, the Spokane *Spokesman Review*, the *Seattle Times*, the *Portland Oregonian*, the Salt Lake City *Desert News*, the *Denver Post*, the *Chicago Sun Times*, the Columbia South Carolina *State and Record*, the Charlotte North Carolina *Observer*, and the *Washington Star*, covered individual facilities in the nuclear weapons complex and occasionally reported environmental, health and safety problems. In addition, some specialized magazines like the *Bulletin of Atomic Scientists*, *New Scientist*, *Science Magazine*, and *Technology Review* would publish feature stories. But generally, local papers tended to run Associated Press stories or stories that didn't go into much depth or favored facilities.

National news stories linking the sites did not break until the *New York Times* began running a series of front-page stories in 1988 about scandals across the nuclear

[150] F.G. Gosling and Terrance R. Fehner, Closing the Circle: The Department of Energy and Environmental Management 1942-1994, U.S. Department of Energy (Washington, DC, 1994) http://energy.gov/sites/prod/files/2013/04/f0/Gosling%20and%20Fehner%20-%20Closing%20the%20Circle%20%28complete%29.pdf, p. 51.
[151] Interview with author.

weapons complex. Other national papers then picked up the stories. Keith Schneider at the *New York Times* began publishing a four-part series about the crumbling nuclear weapons complex, with support from editor Soma Golden who shared his outrage at the health and environmental hazards at DOE facilities. As one media expert put it, "Keith Schneider at the *New York Times* gravitated to the issue. He thought of it as being a wealth of coverage. The *Times* deserves major credit for publishing front-page stories on whistleblowers and contamination throughout the nuclear weapons complex. Keith Schneider interviewed people in local communities and started rolling with articles, and the *Times* sustained coverage."[152] Other *New York Times* reporters, including energy reporter Matthew Wald, defense reporter Michael Gordon, metropolitan reporter Fox Butterfield, labor reporter Kenneth Noble, and medical reporter Harold Schmeck, Jr. also contributed articles. In total, from October until December 1988, the *New York Times*' crusade included more than 85 articles about the nuclear weapons complex, 39 of which were published on the front page.[153] The *Times* set off a competition of sorts and the *Washington Post* also conducted its own investigations. One media expert observed, "It became a competition between the two papers to do exposés of the nuclear weapons complex and cover breaking events."[154] During the same time period, the *Washington Post* ran 21 articles, seven of which were on the front page. Forty-six articles also appeared in the Los Angeles Times, seven of which were on the front page; and the Wall Street Journal published 21 articles, seven on the front page; the Christian Science

[152] Interview with author.
[153] William Lanoutte, "Tritium and the Times: How the Nuclear Weapons Production Scandal Became a National Story," Research Paper for the Joan Shorenstein Barone Center on Press, Politics and Public Policy, Harvard University, May 1990, http://shorensteincenter.org/wp-content/uploads/2012/03/r01_lanouette.pdf.
[154] Interview with author.

Monitor carried five articles.[155] The intensive news investigations in 1988 exposed how dangerous the nuclear weapons complex was and gave issues national prominence. More than just isolated incidents at remote sites, news coverage showed that the government failed to protect the environment, health and safety of workers and whole communities of people.

With the end of the Cold War, the international context also changed and this contributed to making it politically possible for DOE to make admissions about problems across nuclear weapons complex. One independent technical nuclear expert observed that Mikhail Gorbachev's ascendance to power in the Soviet Union was an important factor because it lessened domestic fear about the Soviet threat and people were no longer afraid to be critical about the environmental legacy at home.[156]

Following the collapse of Berlin Wall and imminent transformation of USSR, the administration of President George H.W. Bush was tasked with trying to come to grips with what to do with U.S. nuclear forces in a changed international context. The administration began questioning how many nuclear weapons the U.S. really needed. President Bush tasked Colin Powell, then Chairman of the Joint Chiefs of Staff, with a top to bottom review of nuclear capabilities in 1989. The Bush administration review concluded that the U.S. had far too many nuclear weapons and that the DOE needed to be radically downsized and modernized.[157] Under the Bush administration, the U.S. nuclear stockpile was reduced by 50 percent, from about 22,000 to 11,000 warheads, the largest nuclear arsenal reduction in U.S. history. Energy Secretary Admiral James Watkins was

[155] Lanoutte, 1990.
[156] Interview with author.
[157] Nick Ritchie, *US Nuclear Weapons Policy After the Cold War: Russians, 'Rogues' and Domestic Division* (London, England: Routledge, 2008), p. 20-25.

charged with ushering in a reconfiguration plan for DOE. Under Admiral Watkins, the DOE downsized the nuclear weapons complex by 80 percent, ended the production of fissile materials and shuttered large industrials sites, like Rocky Flats, Fernald and Hanford. One former Congressional staffer noted that, "Admiral Watkins was the new sheriff in town. Some agency personnel and contractors hated him. He didn't believe in 'faith-based management of contractors'."[158]

To his credit, Admiral James Watkins wasn't in a state of denial over the health and environmental effects of DOE policies and practices. He admitted that the DOE was wrong and that the nation was up to its ears in plutonium and highly enriched uranium. In June 1989, Admiral Watkins announced he was dispatching aggressive "tiger teams" of investigators to assess environmental problems at all of the nation's nuclear weapons facilities and he declared he was creating a "new culture of accountability" at DOE.[159] Mark Gilbertson, an engineer who was asked to lead a "tiger team" at Rocky Flats said the reviews for Admiral Watkins, "changed the culture of the lab system and helped the transition from the cold war mentality. It was an instrument of cultural change that helped prepare us for the future."[160] Admiral Watkins pledged "full disclosure and complete assessment of potential environmental impacts" in the future and began to negotiate with states "to allow direct access and improve state monitoring capabilities." Admiral Watkins also pledged to open up access to health records of 600,000 department radiation workers to determine the effects of testing and production. One of the conclusions under

[158] Interview with author.
[159] Paul Houston, "Energy Secretary Sending 'Tiger Teams' to Probe Problems at Atomic Arms Plants," Los Angeles Times, June 28, 1989, http://articles.latimes.com/1989-06-28/news/mn-4174_1_energy-department-weapons-plants-watkins.
[160] "Badger Engineer Works to Create New Environmental Legacy," University of Wisconsin, Madison Engineering Blog Post, August 24, 2012, http://badgerengineers.engr.wisc.edu/?p=921.

Admiral Watkins tenure was that because of public distrust in DOE's handling of worker and community health studies, DOE's Worker and Public Health Activities Program should be transferred to what is now the Department of Health and Human Services (HHS) in effect because the agency is "more trusted than DOE."[161]

Communities Awaken

An arousal to the health, environment and safety problems at nuclear weapons facilities began in the late 1970s and early 1980s and concerned citizens coalesced to form grassroots community organizations to address the issues. It is important to note that the first real attention to Cold War damage and the idea that there should be justice began in the late 1970s when Marshall Islanders received some compensation for exposure to nuclear testing. As a result, atomic workers began asking questions. In 1976, Robert Alvarez began organizing atomic veterans and downwinders to pursue justice for accidental and intended exposures. In April 1980, Alvarez, Norman Soloman, Pam Solo of the American Friends Service Committee Rocky Flat Project, Mike Jendreczyk of Fellowship of Reconciliation, and Eleanor Walters of the Environmental Policy Institute organized a National Citizens' Hearing for Radiation Victims, modeled after the Bertrand Russell tribunals that dealt with the Vietnam War. They identified people whose lives had been affected, including Marshall Islanders, atomic veterans, and downwinders from the Nevada Test Site and uranium mines. Health physicist Dr. Karl Morgan oversaw the tribunal to hear testimonies of impacted lives. It turned out to be a galvanizing event as people were waking to the idea that they were in a struggle for justice and realized that

[161] Committee to Review the Worker and Public Health Activities Program, "Review of the Worker and Public Health Activities Program Administered by the Department of Energy and the Department of Health and Human Services" (December 2006), National Academy of Sciences, p. 3.

others shared in their struggle.[162] According to Alvarez, "This was the first time that veterans who had kept a lot of secrets stepped into the limelight and started organizing. The shared idea was that justice was being denied to people who were knowingly put at risk. At the same time, President Reagan was restarting old facilities and talking about a plutonium gap. The Reagan administration took the policy view that compensating people who were exposed to radiation during the early Cold War or while working at facilities was a dagger aimed at the heart of the national security mission. We [activists working with atomic veterans] fought it tooth and nail."[163] It gave rise to the National Association of Downwinders. By the early 1980s, Alvarez became active in trying to raise awareness about health, safety and environmental problems across the nuclear weapons complex and worked with community organizations, including with Frances Close, a cofounder of the Energy Research Foundation in Columbia, South Carolina that watchdogged the Savannah River Site. Alvarez also recruited Dr. Arjun Makhijani to apply and devote his technical expertise to analyzing and exposing problems at DOE facilities. In the early 1980s, Alvarez used his knowledge of FOIA to obtain information about environmental and safety problems in the nuclear complex. For example, through one FOIA request he obtained a database of over 14,000 incidents, accidents and spills at the waste tank farm at the Savannah River Site, which he gave to Makhijani to analyze. From their findings, Alvarez and Makhijani published a report, "Deadly Crop in the Tank Farm," in 1986 and received coverage from the *New York Times*, *Washington Post* and other papers.

[162] Interview with author.
[163] Interview with author.

As discussed in the opening of this chapter, residents in Fernald, Ohio began organizing in 1984 when they learned that their wells had been contaminated by uranium. Revelations about problems at other nuclear weapons facilities also catalyzed residents in nearby communities and they formed grassroots organizations, many of them volunteer based, dedicated to lifting the veil of secrecy about the extent of problems and to hold the DOE accountable. A discussion of every group is beyond the scope of this project, but the following provides a brief sketch of community awakenings across the country.

As mentioned above, Frances Close Hart, who hailed from a prominent South Carolina family, was a mother of two children and co-founded of the Energy Research Foundation in 1980 because she was concerned about DOE dumping nuclear waste in her backyard. She set out to change public attitudes about the Savannah River Site, which until then had enjoyed public support. She was not an expert in nuclear issues or environmental regulation, but quickly earned respect for her willingness to educate herself and slog through technical material. Close also worked with and enjoyed access to the South Carolina Congressional delegation and with Governor Richard Riley. In 1982, her organization joined the Natural Resources Defense Council in filing a lawsuit to block plans for restarting a production reactor at SRS. At the same time, South Carolina refused to issue discharge permits to the site, effectively preventing it from dumping water from the reactor's cooling system into nearby streams. After the *Leaf v. Hodel* ruling, DOE finally relented, agreed to install cooling ponds and to abide by state thermal pollution regulations.[164]

[164] Daniel Charles, "The People Versus the Complex," *Bulletin of Atomic Scientists*, Vol. 5 No. 1, January/February 1988.

Located near Denver, Colorado, the Rocky Flats nuclear plant produced more than 70,000 plutonium pits or "triggers" for nuclear bombs between 1952 and 1989. However, it wasn't until the 1970s that the site first came on the public radar screen when reports revealed that plutonium fires in 1957 and 1969 had wafted toxic smoke over the Denver metro area. According to a 1970 Atomic Energy Commission report, levels of radioactive plutonium in soils just east of the plant ranged up to hundreds of times higher than levels outside the plume of the airborne plutonium.[165] The plant was subject to civil disobedience by local residents on and off for years, but in 1979, the Rocky Flats Truth Force decided to occupy the railway tracks leading in and out of the facility for a year. Rocky Flats was generating large amounts of waste and to keep operating, the site had to send its radioactive and hazardous waste to Idaho. Local residents thought that if they could keep trains from delivering bomb-making supplies and stop the waste shipments, they could halt operations.[166] Over the next several years, ongoing protests culminated in a mass protest in 1983 that drew 17,000 local residents to encircle the 17-mile perimeter of the plant in a display of civil disobedience and to press for more information and government accountability. The same year, LeRoy Moore, a religious studies professor at the University of Denver who taught nonviolent action, and five others who had participated in the protests, established the Rocky Mountain Peace and Justice Center devoted to nonviolent and civil action, and public education about the site. According to Moore, the Rocky Flats site was getting attention as the same time that he was trying to convey to his students and others what he thought were the three fundamental threats to humanity: "nuclear holocaust, the possibility of environmental destruction and the reality

[165] *P. W. Krey and E. P. Hardy, "Plutonium in Soil Around the Rocky Flats Plant," Atomic Energy Commission Health and Safety Laboratory, 1970.*
[166] Interviews with author.

of authoritarian decision-making in government."[167] While protesters weren't successful in shutting down operations at Rocky Flats, they did delay deliveries and raise awareness by generating media coverage.[168]

In 1987, whistleblowers informed the EPA and FBI about unsafe conditions at Rocky Flats. After gathering evidence, the FBI and EPA conducted an extraordinary raid of the facility sponsored by the Department of Justice, dubbed "Operation Desert Glow," on June 6, 1989. The subsequent grand jury investigation gathered more evidence of wrongdoing by Rockwell International, the site's contractor, which contributed to the growing national awakening of the legacy of Cold War weapons production and the need to balance national security priorities with health and environmental protection. The plant was shut down in November 1989, the same month the Berlin Wall fell. According to Moore, "It took the FBI raid as confirmation that what we were talking about was not wrong. The sad thing about the FBI raid was that there was an out of court settlement, so the documents demonstrating the environmental crimes committed by the government and its contractor (Rockwell International) continue to be sealed in a federal court in Denver."[169]

In Livermore, California, peace camps at the Lawrence Livermore National Laboratory (LLNL), one of two locations where all U.S. nuclear weapons are designed, attracted local residents, including Marylia Kelley. Kelley and concerned neighbors, including a lab worker, realized that peace, justice and environmental concerns were connected at the lab and founded Tri-Valley Communities Against a Radioactive Environment (Tri-Valley CAREs) in 1983. They set out to educate themselves and the

[167] Interview with author.
[168] Interview with author.
[169] Interview with author.

community about what was happening behind the classified fence line at a time when the lab was under a thick veil of secrecy, especially about environmental and health issues. Trained as a journalist, Kelley brought her knowledge of the California Public Records Act (CPRA) and the Freedom of Information Act (FOIA) to garner information.

After the 1984 *Leaf v. Hodel* decision requiring DOE facilities to comply with environmental laws, the state of California began to claim jurisdiction and take stock of hazardous waste. Kelley filed a petition under the CPRA and catalyzed the state health department to conduct its first state investigation of the site. One of the discoveries was that incompatible wastes that might react were being mixed together in disposal containers. The investigation also found leaking waste drums on the site. Kelley filed a second CPRA request and took pictures of their pictures of the leaking drums and contamination. Kelley wrote up her findings and then filed with the California state health department for a public hearing, arguing that the site needed a permit to operate. It turned out to be a many years-long struggle that was eventually litigated under the California Environmental Quality Act, but resulted in a revised permit under the Resource Conservation and Recovery Act (RCRA) that included safeguards giving the state health department some regulatory oversight of the facility.

In 1984, LLNL was nominated to be placed on the EPA's National Priorities List of Superfund sites. As the site was being considered, Tri-Valley CAREs met with the California state health department and the department of environmental control to push them to use their authority to the utmost. Kelley's position was that the site was an imminent and substantial endangerment to public health and the environment because

they had found volatile organics and toxic contaminants along the lab's fence line.[170] The state forced tests of drinking water, which found contamination and volatile organics in the wells. The state required the lab to put homes along the fence on municipal drinking water. The state also condemned the land and the lab acquired land to create a buffer zone between the site and residents. After a struggle with DOE, LLNL was finally added to the Superfund list in 1987 with a high hazard ranking because it was located in a densely populated area that was affecting community water sources, and threatened municipal drinking water. Tri-Valley CAREs has since remained active in public education and pressing for public involvement in environmental remediation of LLNL's main site, as well as Site 300, a massively contaminated, high-explosive test range that has been used by the lab since 1956.

In Idaho, several individuals serendipitously met in Boise's Julia Davis Park in 1979 and expressed concerns about news stories about a report by U.S. Geological Survey hydrologist Jack Barraclough revealing that the Idaho National Engineering Laboratory (INEL) had been routinely injecting hazardous and radioactive waste into the Snake River Aquifer for nearly 20 years.[171] The aquifer served as the sole source of drinking water for a quarter of a million people. The residents, who were also concerned about the Three-Mile Island nuclear power accident in March 1979, banded together to form the Snake River Alliance with the purpose of educating the public about the injection wells. Nick Nichols, a former reporter for the *Idaho State Journal* and media relations director for the lab said it was the first time that anyone really raised

[170] Interview with author.
[171] Snake River Alliance, Mission, Vision and History, http://snakeriveralliance.org/mission-vision-and-values/.

environmental issues and it was new for the lab.[172] The Snake River Alliance organized its first major action, a day of protest, on September 13, 1980. The group pressed the state to investigate the practice of injecting hazardous and radioactive waste in the aquifer and the state of Idaho hired radiologist Gerald Ramsey. The Alliance interviewed Ramsey and published the interview its newspaper, *The Idaho Sun* in 1982 to alert the public to his findings. That same year, they also attempted to run a ballot initiative to step up state monitoring of waste at the lab. According to Snake River Alliance members, following the 1984 *Leaf v. Hodel* decision, their group and the state had much more oversight and access to information and they used the information to rally the public to oppose INEL's injection of nuclear waste into the Snake River Aquifer and to stop the Special Isotope Separator nuclear weapons facility, both of which were essentially halted in 1987.

Until 1986, the 52 reactors at the lab had been used primarily for research purposes. The DOE proposed a new $1.2 billion reactor, the Special Isotope Separator, that used lasers to produce plutonium for nuclear warheads. The SIS program was supported by both Idaho Senators, Steve Symms and Jim McClure. The Snake River Alliance used the National Environmental Policy Act Environmental Impact Statement (NEPA EIS) process to publicly scrutinize the process, which took the lab and the DOE by surprise. The Alliance organized hundreds to attend the public hearings for the SIS, which was covered by the *New York Times*. So many members of the public signed up to testify against the program at public hearings that they had to be extended. It also reached out the Natural Resources Defense Council, who testified against the project at Idaho hearings and lobbied against the project in Washington, DC. Beatrice Brailsford led the

[172] Nathaniel Hoffman, "Guarding Against Nuclear: 30 Years of Snake River Alliance Campaigning," Boise Weekly, September 16, 2009, http://www.boiseweekly.com/boise/guarding-the-snake/Content?oid=1180746.

organization's campaign to stop the SIS, which included meetings, phone calls and media outreach campaigns. Most notably the organization sponsored a number of radio and television commercials featuring actors Mariel Hemingway and Scott Glenn, who were opposed to the project.

Two other factors also helped halt the SIS. In Spring 1988, Energy Secretary John S. Herrington told a subcommittee of the House Appropriations Committee that the nation was "awash in plutonium. We have more than we need."[173] South Carolina Representative John M. Spratt, Jr., a member of the House Armed Services Committee, conceded that it would be difficult to start new projects like the SIS when the nation needed to address environmental and infrastructure concerns across the nuclear weapons complex.[174] In 1988, Idaho Governor Cecil D. Andrus closed the states borders to shipments of radioactive waste to INEL from Rocky Flats. In a letter to Secretary Herrington, Governor Andrus said that Idaho would no longer serve as a nuclear dumping ground because it had been promised that the waste would be removed long ago but the stockpile had grown to 2.4 million cubic feet of material.[175] Around the same time, the *Twin Falls Times* exposed that INEL had buried several million cubic feet of radioactive waste in the ground above the Snake River Aquifer, the revelations of which brought more angst about the lab's operations. By 1990, the administration of President George H. W. Bush eliminated the line item for SIS in the budget, but the Snake River Alliance played a critical role in eroding political support for the project. According to Brad

[173] Keith Schneider, "Rethinking the Arms Complex," New York Times, December 25, 1988, http://www.nytimes.com/1988/12/25/weekinreview/the-nation-rethinking-the-arms-complex.html.
[174] Schneider, December 25, 1988.
[175] Keith Schneider, "Idaho Shuts Border to Nuclear Waste From Colorado Weapons Plant," New York Times, September 1, 1989, http://www.nytimes.com/1989/09/01/us/idaho-shuts-border-to-nuclear-waste-from-colorado-weapons-plant.html.

Bugger, a former *Idaho State Journal* reporter and DOE employee, "The Snake River Alliance and a number of other environmental groups across the country were very instrumental in saying, 'we want a voice in the cleanup ... and we have a right to be informed.'"[176]

New Mexico is home to the Waste Isolation Pilot Plant (WIPP), the first national nuclear weapons waste site, Los Alamos National Laboratory and the Sandia National Laboratory. The Southwest Research and Information Center (SRIC) was founded in 1971 by individuals were among Ralph Nader's original Nader Raiders in the 1960s. Don Hancock worked in Washington, DC with Nader and then moved to New Mexico. He began as a volunteer at SRIC in 1975. The original idea of the organization was to do research, advocacy and litigation in the southwest to promote the health of people and communities, protect natural resources, ensure citizen participation, and secure environmental and social justice. SRIC began a greater focus on nuclear issues when the DOE announced in 1981 that it was going to open an underground repository for the military's radiation-contaminated waste in New Mexico by 1986. According to Don Hancock, "It put the issue on the radar map because everyone wanted more information."[177] Since then, SRIC has analyzed and provided technical information about WIPP to educate communities, policy makers, and the media about the site, as well as about nuclear waste storage and disposal policies. SRIC counts delaying the opening of WIPP until the RCRA permit for the site was strengthened among the organization's successes. Other groups of concerned individuals, the efforts of which are discussed in

[176] Nathaniel Hoffman, "Guarding Against Nuclear: 30 Years of Snake River Alliance Campaigning," Boise Weekly, September 16, 2009, http://www.boiseweekly.com/boise/guarding-the-snake/Content?oid=1180746.
[177] Interview with author.

more detail in chapter five, also formed in New Mexico by the late 1980s, including the Los Alamos Study Group and Citizens Against Radio Active Dumping in Albuquerque, Concerned Citizens for Nuclear Safety in Santa Fe. Staff from CCNS also went on to found Nuclear Watch New Mexico in Santa Fe in the late 1990s. These groups have been primarily concerned with health, safety and environmental concerns at the Los Alamos National Laboratory (LANL), Sandia National Laboratory (SNL), and WIPP. CCNS, for example, was formed by members of the community who shared concerns about transporting nuclear waste from LANL to WIPP.

Residents in Oak Ridge, Tennessee had been largely supportive of the nuclear reservation (Oak Ridge hosts three distinct sites: Oak Ridge National Laboratory, Y-12 and the East Tennessee Technology Park, formerly the K-25 Gaseous Diffusion Plant, each with distinct sources of funding and managed by different contractors). However, there was longstanding concern by Knoxville Quakers about "the bomb plant in the backyard."[178] An effort in the 1970s to build a peace coalition with labor organizations fell apart because labor was unwilling to talk about nuclear weapons. Meanwhile, a nurse from North Carolina and a veterinary school student from Knoxville met while riding back from a demonstration at the Nevada Test Site and realized they did not have to travel across the country to protest nuclear weapons. The two teamed up with a nuclear engineer, who was a Quaker, and created a small coalition to hold a nonviolent direct action in Oak Ridge on the anniversary of the U.S. atomic bombing of Hiroshima in 1988. In the debriefing from that action, the Quaker challenged the others to organize for one year to see if they could do a bigger demonstration. As a result the Oak Ridge Environmental Peace Alliance (OREPA) was born. The opening of DOE through the

[178] Interview with author.

Leaf v. Hodel lawsuit initiated in Oak Ridge to environmental scrutiny set the table for OREPA to raise environmental issues. In addition, the Natural Resources Defense Council helped educate OREPA and other grassroots groups in 1989 before the first Programmatic Environmental Impact Statement hearings about the transformation of the nuclear weapons complex. According to OREPA coordinator Ralph Hutchison, "It helped us understand the legal environment and introduced us to our colleagues."[179]

In Washington state, in particular, a sleeping giant of opposition awoke in 1983 because Hanford was being seriously considered as the national waste repository. For the first, time there was a great deal of concern and opposition in eastern Washington and downriver in Portland to Hanford, which had largely received quite a bit of public support in the past. By 1985, groups like the Hanford Education Action League (HEAL) in Spokane started organizing events and digging more deeply for information about Hanford. The Environmental Policy Institute worked with Tim Connor and Larry Shook, both investigative journalists working with HEAL, to file FOIAs for more information about Hanford. Under pressure, DOE released some 19,000 documents that revealed glimpses of the history of Hanford, including intentional releases. The result was more public angst, pressure and questioning about what else was happening at the site.[180]

From Islands of Activism to a Movement for Accountability

Although some groups had been active at individual sites, the idea to bring together "communities living downwind and downstream" of the nuclear weapons complex took root in the Pacific Northwest. As previously mentioned, there was much discussion in 1983 about a high-level national nuclear waste repository and a siting

[179] Interview with author.
[180] Interviews with author.

selection process was narrowing to Hanford Nuclear Reservation, Deaf Smith County near Pantex and the Nevada Test Site. Around the same time, plans of the Washington Public Power Supply System (WPPSS), a small public agency in Richland near the Hanford nuclear reservation that had undertaken an ambitious construction project in the 1970s to build five large nuclear power plants, were imploding.[181] In 1983, cost overruns and delays led to cancellation of two plants and a construction halt on two others. The agency defaulted on $2.25 billion of municipal bonds, the largest municipal bond default in U.S. history, and legal action was brought against the agency. As a result of these events, there was strong opposition to nuclear power in the Pacific Northwest.[182] Residents of Seattle rejected participation in WPPSS and residents of Skagit County passed a referendum rejecting a nuclear power plant in their county.

Attention to nuclear weapons issues also gathered strength in the Pacific Northwest because of organizing around disarmament and peace issues. During the 1980s, Greenpeace had substantial offices and staffing in the Pacific Northwest and was very active organizing against the trident submarines carrying nuclear weapons and against nuclear power. The Pacific Northwest provided the group's strongest funding and membership base.[183] The Committee for a *SANE* Nuclear Policy and the Nuclear Weapons *Freeze* (SANE/Freeze movement) were also actively organizing for peace and disarmament in the region.

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[181] Daniel Pope, *Nuclear Implosions: The Rise and Fall of the Washington Public Power Supply System* (Cambridge, MA: Cambridge University Press, 2008).
[182] Daniel Pope, "A Northwest distaste for nuclear power," Seattle Times, July 31, 2008, http://www.seattletimes.com/opinion/a-northwest-distaste-for-nuclear-power/.
[183] Associated Press, "Greenpeace to close offices, reduce staff," The Spokesman Review, August 10, 1997.

In addition, Hanford was one of the main issues in the 1986 race for U.S. Senate in Washington state. There were public debates about whether to restart the Washington Nuclear Power Number 1 (WPN-1) reactor to produce weapons-grade plutonium at the same time that communities living downwind from the site were raising issues about environmental contamination. The Senate race also highlighted concerns about the possibility that DOE might select Hanford as the nation's high-level nuclear waste repository. Democratic challenger Brock Adams used the issues in television ads to motivate his liberal Puget Sound base to narrowly defeat Republican incumbent Slade Gorton.[184] Democratic political consultant Frank Greer designed a television ad for Brock Adams that ran late in the race equating the WPN-1 reactor at Hanford to a bomb factory and the ad was viewed as contributing to Adams' slim victory.

Against this backdrop, a small group of young wealthy donors that comprised the A Territory Resource Foundation (now the Social Justice Fund NW), with input from activists, decided that the Hanford nuclear facility was a logical focus point for a project given that it touched on a range of issues that connected environmentalism to peace, justice and disarmament, including radioactive and toxic contamination of the Columbia River, plutonium production, and the possibility of siting a high-level nuclear waste repository.[185] In addition, Hanford was the locus of a number of different advocacy and research organizations in the region and nationally. ATR hired Bill Mitchell to run the Hanford Project, which was backed by donors including Pat (Gracie) Close, whose sister Frances Close had founded the Energy Research Foundation in South Carolina that watchdogged the Savannah River Site (SRS).

[184] Jim Lynch, "Gorton Challenger Sims Hires National Strategist," *The Spokesman Review*, June 28, 1994, p. A1.
[185] Bill Mitchell interview with author.

As part of the ATR Hanford project, Bill Mitchell began convening meetings in early 1986 that brought together expert activists, including Robert Alvarez and Dr. Arjun Makhijani, and a wide range of peace and environmental groups that had been working on similar issues related to Hanford but had not been coordinating efforts.[186] When the Chernobyl disaster occurred in April, the groups coordinated press conferences in Portland, Seattle, and Spokane that would focus on the N Reactor at Hanford, which produced plutonium, and on the WNP-1 conversion to a tritium production reactor. As a result there was great local and regional press coverage at the same time Alvarez and Makhijani were getting national coverage questioning design similarities between the N Reactor at Hanford and the Chernobyl reactor.[187]

After the 1986 election, it became apparent to Mitchell that the regional coalition of groups would not be successful on the high-level waste issue or on other weapons production issues if they did not examine the whole picture, rather than just one region or facility.[188] What made the work different from other national organizations already

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[186] The first meeting was held in Olympic Peninsula with some 40 people representing organizations ranging from SANE/FREEZE and Greepeace to Physicians for Social Responsibility to Washington Public Research Interest Group, Audubon Society, Sierra Club, Hanford Education Action League and other community groups, and journalists in attendance.

[187] See for example: Lynn Simross, "Chernobyl and Hanford: Nuclear Author Draws Parallels," *Los Angeles Times*, May 7, 1986, http://articles.latimes.com/1986-05-07/news/vw-3730_1_hanford-nuclear-reservation/2. Because experts questioned the design of the N reactor and it received national media attention, Senators Mark Hatfield and James Weaver directed the U.S. Government Accounting Office (GAO) to investigate similarities and differences with the Chernobyl reactor. GAO produced a report in August 1986, which found that there were some significant differences between the reactors that would prevent a nuclear chain reaction from occurring, but that the N reactor needed significant upgrades for safe operation. U.S. Government Accounting Office, "Comparison of DOE's Hanford N-Reactor with the Chernobyl Reactor," RCED-86-213BR, August 5, 1986, http://www.gao.gov/products/RCED-86-213BR.

[188] Interview with author. Also it should be noted that when ATR's one-year project came to a close, the Partnership for Democracy, formerly The Youth Project and a foundation where Mitchell had previously worked, took on the Hanford project as the Northwest Nuclear Safety Campaign to continue organizing the coalition of groups. Mitchell raised a modest amount of funds from local and regional donors to continue the work of the coalition.

working on nuclear issues is that "Sierra Club, NRDC and Greenpeace, didn't have the grassroots apparatus that we thought we could create" to press for changes in federal policies, according to Bill Mitchell.[189] From previous work, Mitchell was aware of grassroots groups at sites across the country and he raised some funds to bring them together in 1987 in Black Forest, Colorado. Investigative reporter and public interest advocate Tim Connor penned a Citizens Living Under the Shadow of the Nuclear Complex Bill of Rights document that became the founding vision and position for the new coalition named the Military Production Network and was used to garner media attention to the issues that communities faced. A broader meeting at Blue Mountain Center in New York in early 1989 further galvanized grassroots groups who had been working in isolation to start thinking about the broader nuclear weapons complex and how sites were linked to one another, not just the facilities in their own backyard.[190] According to Bill Mitchell, "There was sense early on that if we could connect people we could do more than just what we were doing at the individual sites. All of the sites were affected by national policy and if we worked together, we could change national policy."[191] By working together, the groups who were on the ground and exposed at individual sites, believed they could elevate a set of issues that had been separate and not previously connected in the public and media consciousness.[192] An early adapter of electronic communications as means for coordinating efforts, the network began using an electronic bulletin board, piggy backing off of technology provided by Greenpeace,

[189] Interview with author.
[190] Interviews with author.
[191] Interview with author.
[192] At the request of funder Barbara Dudley, the network developed an issue map that identified issues for each of the facilities and overarching nuclear weapons complex issues, such as environmental contamination, threats to worker and public health and safety, and production issues.

which enabled them to communicate with each other, to instantaneously report on weapons complex developments, and to coordinate reactions, including press releases.

In 1989, the network decided it needed a more professional media approach and hired Bob Schaeffer as a consultant to work with the groups on a coordinated media strategy and train the groups on public education. The trainings helped groups frame messages and strategize how to communicate effectively and implement a communications campaign. In addition to the trainings, Schaeffer was very effective at pushing the personal stories of communities to the national media, especially to the *New York Times* and the *Washington Post* in the late 1980s and early 1990s, which helped re-frame the nuclear weapons issues in terms of environmental, public and safety concerns and to keep media and Congressional attention on the issues.

Beginning in 1991, the network developed several consensus positions on issues, including on environmental remediation, health and safety, and new weapons production, among others. The position statements reflected clear agreement among grassroots organizations across the country that the culture of secrecy at DOE and its predecessor agencies, and its historic self-regulation were contrary to democratic principles. With regards to environmental contamination, ANA called for public and independent regulatory accountability to ensure that federal government fulfills its obligation to "effectively cleanup the legacy of radioactive and toxic contamination created in an atmosphere of secrecy, devoid of public input and external regulatory oversight."[193] Several observers outside of the network noted that MPN/ANA's biggest impact was to raise questions about whether DOE's policies and practices were consistent with democratic governance. One analyst described ANA's efforts as "relentless." According

[193] Alliance for Nuclear Accountability, "Position Statement on Cleanup," October 1996.

to another analyst, "The democracy question was so insistently raised and so well done by Bill Mitchell and Bob Schaeffer, especially in the early years to the *New York Times*. Once the press caught on, it made the establishment react."[194]

Driving DOE to greater openness was an enduring success of the network and occurred under the administration of President Bill Clinton. Environmental remediation and waste management across the nuclear weapons complex were among the administration's top priorities for DOE. Energy Secretary Hazel O'Leary hired individuals who had previously worked on issues of health, safety and environmental pollution in the nuclear weapons complex.[195] According to several interviewees, they found an open ear on many issues, including on public participation and on openness issues, and there was good communication with administration appointees who cared about the health, safety and environmental issues. Responding to pressure from the grassroots, DOE announced in 1993 it would create site-specific advisory boards to allow for greater public participation in decision-making about environmental remediation and waste management at nuclear weapons facilities. In 1994, O'Leary launched an Openness Initiative to address community concerns about weapons complex secrecy.

Networking for Community Empowerment

A central goal of MPN, renamed Alliance for Nuclear Accountability in 1997, has been to empower communities and individuals living under the nuclear shadow.[196] Since

[194] Interview with author.
[195] Individuals included Robert Alvarez, Jim Werner from the Natural Resources Defense Council, and Tara O'Toole from the Congressional Office of Technology Assessment.
[196] Just as groups began communicating more, so did government representatives. It is beyond the purview of the project at hand, but a few years after the establishment of the grassroots network, states began networking as well. There was a sense among government representatives that they could do more because their constituencies demanded it. In 1993, the National Governor's Association began convening states that host weapons production and research facilities to

grassroots and community organizations are under-resourced and thus at a disadvantage compared to the resources and power of federal agencies and contractors, they have viewed networking as a fundamental means of leveraging their limited resources. One of the most important functions of the network has been to provide mechanisms for communications to overcome information disadvantages.[197] Increased information exchanges among grassroots groups resulted in forcing DOE to come up with a transparent and coherent 'cleanup' strategy, perhaps the network's greatest success. In the late 1980s and early 1990s, as DOE began to assess what would be required to address the health and environmental legacy of the nuclear weapons complex, agency representatives spent time traveling and meeting with communities at different sites. Grassroots groups would attend the meetings and then share information with each other. Lisa Crawford of FRESH noted that information sharing provided much-needed support, "If we got in a weird situation, we could call someone at other sites and they could give you an insight. We could share information that we couldn't get from DOE and that kept DOE on their toes."[198] As the groups shared information, they were able to get a better visualization of the scope and complexity of environmental contamination and health safety issues across the complex. They also learned that DOE was telling the public different things at different sites. DOE was also shuffling waste from site to another and calling it "cleanup." Individuals from grassroots community groups began asking DOE questions about why they were being told one thing while other communities were being

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facilitate discussion among states and to help them negotiate environmental remediation and waste management issues among themselves and with DOE.

[197] In addition to meetings, the network holds regularly scheduled and as needed conference calls and extensively uses electronic communication, including email and listserves, to allow the groups to exchange information and ideas.

[198] Interview with author.

told something else. Grassroots organizations started holding DOE accountable in a way the agency had not been before. As Ralph Hutchison at the Oak Ridge Environmental Peace Alliance (OREPA) said:

> "Our communications with other groups, through the Military Production Network and the secret email network set up for us by Dick Dillman of Greenpeace (in the pre-email days), allowed us to share information in ways that consistently gave us the upper hand in conversations with DOE which operated in site silos. I recall a meeting where a contractor turned to his DOE overlords and said, 'You don't get it, do you. They're way ahead of you on this. They talk to the people at other sites.' We had just invoked the experience Hanford had with leaking barrels in discussions about the leaking barrels at Oak Ridge—a $126 million failure by DOE to learn lessons. This capacity for cross-site interaction continues to confound DOE/NNSA."[199]

Ralph Hutchison's quote highlights an important point that a problem in one community is frequently similar to a problem in another community. By sharing information, it became apparent that problems were systemic and not isolated to one particular site. In addition, sharing information has made it more difficult for DOE and contractors to simply say a problem has been addressed.

Information sharing has also helped community groups develop a national perspective on how sites interlock together. As Jay Coghlan of Nuclear Watch New Mexico put it:

> "As citizens, we're dealing with a nuclear weapons complex, with an emphasis on *complex*, and each of the sites is really just an interlocking cog in a big machine. One unique virtue of ANA is that it provides a nation-wide perspective. To the credit of our member groups, we are not so much NIMBY (Not In My Back Yard). We look at the national picture, both in terms of 'cleanup' and in terms of nuclear weapons issues. As individual member groups, we care passionately about specific sites, but we're not parochial about it. Information sharing has been very important, providing a foundation for dealing with national issues and not falling prey to the divide and conquer strategy of DOE, especially when it comes to waste issues."[200]

[199] Interview with author.
[200] Interview with author.

The importance of this point was illustrated in decisions to remediate the Fernald nuclear site in Ohio. One of the first big hurdles in the remediation process at Fernald was the decision to determine what to do with the site's radioactive and hazardous wastes. There was a fracturing within the Fernald community about the remedy they could live with. As the decision process began, FRESH, in addition to most of the community and state regulators, wanted all of the waste removed from the site, with the site restored to background levels of radiation. According to many participants in the remediation process, including DOE, the contractor and state regulators, FRESH made an invaluable contribution to the decision-making process by reaching out to people across the country and relaying the perspectives from other communities who would be impacted by shipping radioactive waste offsite. FRESH traveled and met with other ANA members and communities where Fernald's waste might be shipped. Lisa Crawford of FRESH observed: "The Military Production Network/Alliance for Nuclear Accountability really helped us because we were so insular. We were able to connect the dots across the country."[201] Tom Schneider of Ohio EPA noted the role that FRESH played in changing the community's perspective on what to do with the radioactive waste:

> "That FRESH was in tune with other sites had a huge role. Because FRESH was aware of what was going on at other sites and knew folks at other sites, it impacted decisions at Fernald. For example, they didn't want to ship our waste to other peoples' backyard…they didn't want to put our problem in someone else's backyard. It lent a different perspective to cleanup decisions. Without it, we wouldn't have gotten the same level of success we got with cleanup."[202]

In addition to information sharing, the network has also provided value by convening two regional meetings every year to raise awareness about specific sites and

[201] Interview with author.
[202] Interview with author.

issues in those communities. As part of the regional meetings, local groups set up site tours for the network. Recognizing the need to develop expertise, the network has provided trainings on technical issues, lobbying, regulatory laws and processes, the federal budget, grassroots organizing, public education and outreach, fundraising, and organizational development. Dr. Arjun Makhijani, who held annual technical trainings, remarked that it was "quite extraordinary the way in which people, even though they struggled to learn numbers, were committed to their communities and neighborhoods and wanted to become better informed. Politics needs to wake up to the fact that NGOs are not just a rag tag bunch, but are well-informed and committed."[203]

Through the network's convening mechanism, members share expertise and strategies with one another. Member groups have trained other groups on using federal and state environmental and information laws organize in their communities and obtain information about sites. The groups also developed novel public education and involvement opportunities, such as requesting tours at nuclear weapons as a means for opening up sites to questions and requests for information. Several interviewees observed that touring sites and facilities has made a real impact on the ability of individuals to understand the complexity and extent of the problems.

ANA has also played an important role in raising awareness in Congress and is one of the few forces to consistently draw Congressional attention to ongoing issues and to press for action. Since 1989, the network has organized an annual lobby days in DC that includes intensive training for community groups on technical issues, how to lobby, and how to use federal laws and political processes to advocate their positions back home. DC Days has been an important vehicle for encouraging activism nationwide and

[203] Interview with author.

bringing community voices to national policymakers and administrators. One grassroots organization commented that the network's DC days were really important for providing impetus to lobby Congress and the structure and training for doing so. Without the network organizing the lobby days, community groups would not have gone to Washington on their own.[204] Another useful outcome of networking has been that local groups can provide access to members of Congress that ANA might not have been able to form a relationship with otherwise. A group from New Mexico, for example, recalled that FRESH was instrumental in helping ANA build a relationship with former Ohio Representative David Hobson. As a result, Representative Hobson was helpful securing funding for environmental remediation and on other nuclear weapons-related legislative battles.

In terms of impact on legislation, the majority of ANA's legislative successes have centered on environmental laws. For example, as discussed in chapter two, the long-term position of DOE and its predecessor agencies was that the Resource Conservation and Recovery Act didn't apply to DOE facilities. ANA groups championed the position that RCRA needed to apply to DOE facilities. Working with Ohio Senator John Glenn, ANA groups fought for the passage of the Federal Facilities Compliance Act of 1992, which made clear that nuclear weapons complex sites are subject to state environmental law enforcement. ANA groups have also fought various attempts to roll back RCRA, Clean Water Act and National Environmental Policy Act standards in Congress.

ANA groups also did the initial advocacy for what became the Energy Employees Occupational Illness Compensation Program Act of 2000 (EEIOCPA) and the Radiation

[204] In addition to DC Days, network staff have raised funds to help representatives of grassroots groups travel to Washington, DC to testify before Congress.

Exposure Compensation Act (RECA) and lobbied for their passage. According to Marylia Kelley of Tri-Valley CAREs, workers were dying and felt guilty about talking about how they were exposed, "Secrecy and the national security rationale was so drummed into them, they felt guilty about talking to others about their sickness."[205] The EEIOCPA was the first time any nation officially acknowledged that its workers were harmed from the production of nuclear weapons. It established an entitlement program to compensate workers and their survivors. Some 700,000 people who worked at over 300 facilities in the United States can file for compensation. Since the legislation was passed, ANA members have facilitated support groups for workers made ill from on-the-job exposures and increased their success in obtaining compensation. Through the support groups, those who choose to apply under EEOICPA can get specific help with their application, which has been very helpful given that it is a very bureaucratic process, there is a high bar for compensation and in many cases it is difficult to reconstruct individual dose records, especially in cases where records were not properly kept.

ANA has also actively engaged in the federal budget process, collectively producing a budget analysis every year, agreeing on priority items and lobbying for those priorities in Congress and at DOE. The network has provided trainings so that all members have some capability of going through the budget and understanding budget documents. According to Susan Gordon, former ANA Director, "We decided that we needed to learn more about the budget process so I wrote a grant and we did two years of training on how to read the federal budget, how to see what was going on at your local site, how to track program areas even when DOE changed names, etc."[206] As result of the

[205] Interview with author.
[206] Interview with author.

trainings, ANA is among the few willing to question how the environmental management funds at DOE are spent. Before learning how to analyze the budget, the network and member groups would advocate blindly for "cleanup" money. Around 1997, as they were better able to track what DOE was doing with the money, they found that cleanup funds were being diverted for use in nuclear weapons programs. From then on, rather than asking for blanket increases in funds for environmental remediation, the groups asked DOE for priorities took a more targeted approach, requesting funding for specific programs and sites.[207]

. In general, every year that the EM funding was increased over the administration request, ANA has been the leading non-governmental organization voice for more cleanup funding. Appropriations made for fiscal years 2003, 2006, 2009, and 2010 are some examples of that effect. Lobbying on the Fiscal Year 2006 Appropriations bill provides a more specific example of success and how the network has gone about lobbying budget allocations. Over the Bush administration's objections, Congress appropriated an additional $30 million for remediation at the Operable Unit 1 at the Mound nuclear plant in Ohio. The funding was added because Sharon Cowdrey from Miamisburg Environmental Safety and Health (MESH) was a constituent of Republican Representative David Hobson, who served on the Energy and Water Appropriations Committee. Cowdrey arranged a face-to-face meeting with Representative Hobson during ANA's 2005 DC Days and lobbied for additional funds for EM programs, including for OU-1. Representative Hobson agreed to the request and added the funding to the appropriations bill.[208] However, on occasion, the network and its member groups have

[207] Interview with author.
[208] Interviews with author.

not lobbied Congress to sustain or increase funds for remediation because they have been against contractor cost overruns or disagreed with a remedy proposed by a contractor.[209] The network has also produced and disseminated analysis to Congress highlighting "radioactive pork" in the DOE budget, and called for cuts to programs to save taxpayers money.

Despite some successes, it has been difficult for groups to always get what they want in terms of budget allocations. Don Hancock observed that groups don't always win in terms of budget allocations because "DOE has always been the department of nuclear weapons more than the department of nuclear weapons cleanup."[210] Indeed, spending on EM has trickled off over time, while spending on nuclear weapons has increased, and it has not made a difference whether the party in control of the White House was Republican or Democrat.[211] Similarly, ANA has not always won legislative battles. For example, ANA has long fought efforts to reprocess nuclear waste, various proposals for which surfaced in the 1980s, 1990s and 2000s.

Tapping the Nation's Environmental Ethos

ANA and its member groups have used environmental laws to get information about sites, to hold DOE accountable and to educate and mobilize the public. In a general sense, grassroots organizations have effectively used the laws to raise public consciousness that projects have environmental impacts that need to be considered before it is undertaken. Perhaps, more importantly, grassroots groups have used the laws in procedural ways to force a discussion of alternative possibilities. "This wasn't even a

[209] Interviews with author.
[210] Interview with author.
[211] For example, there has been more spending on nuclear weapons under the Barack Obama administration than under George W. Bush administration.

consideration before the laws came on the books," according to Jackie Cabasso of Western States Legal Foundation.[212] The network and individual groups have used the public hearing and comment requirements of the laws as an opportunity to raise concern, awareness and opposition to projects.

A specific example of the use of environmental laws was demonstrated in 2005 when the DOE issued a plan, Complex 2030, for redesigning and transforming the nation's nuclear stockpile. Due to NEPA requirements, the agency issued a Supplemental Programmatic Environmental Impact Statement (SPEIS) for expanding nuclear weapons production. The DOE's $150 billion plan included ramping up plutonium pit production by up to 125 new pits per year. ANA organized a campaign around the SPEIS to get the public to submit comments, which they were able to do online. Many DC-based interest groups thought it was a waste of time, but through a concerted campaign, ANA grassroots groups organized public opposition to what ANA program director Mason Lowe dubbed "Bombplex 2030." Member groups organized attendance at public hearings on the plan at twelve sites across the country in November and December of 2006 to voice concerns about the environmental impact of the program.[213] Hundreds turned out at the public hearings. In addition, the groups coordinated a media strategy to garner attention. During the comment period that followed the hearings, some 32,000 members of the public registered their opposition, the most comments the DOE had ever received on a proposal to date.[214] Eventually, the DOE changed the name of the program and

[212] Interview with author.
[213] See for example, Marilyn Bechtel, "California activists assail Bombplex plan," People's Weekly World Newspaper, December 21, 2006, http://www.pww.org/article/articleprint/10330/.
[214] Alliance for Nuclear Accountability, "Complex 2030: Undermines Security, Threatens Environment," Spring 2007, http://www.nuclearactive.org/docs/Complex%202030%20FS%202007.pdf.

reduced the number of pits it wanted to produce. After issuing another PEIS, ANA member groups generated 100,000 comments. After seeing the public response, DC-based groups also took up the campaign and ultimately some 150,000 public comments opposed to ramping up the nuclear complex were submitted. As Susan Gordon explained, "We used an environmental structure to turn it into a public referendum opposed to expanding nuclear weapons production."[215]

In addition to using pubic comment and hearing requirements, ANA groups have also resorted to litigation under environmental laws as a means to obtain information and expose problems at sites. Collectively, member groups had a major win in 1998 when it settled a lawsuit with DOE. In the late 1980s and early 1990s, ANA and its member groups were savvy in viewing the Programmatic Environmental Impact Statement (PEIS) process as a vehicle to do public education and organizing and to put nuclear weapons complex issues on the public agenda. Several member groups first sued DOE in 1989, claiming the agency had to conduct environmental assessments before continuing with plans to increase nuclear weapons production and modernize its facilities. That suit resulted in a federal district court order for DOE to complete a PEIS. DOE abandoned plans to complete the court ordered PEIS in 1994. In 1997, 38 grassroots groups and the NRDC filed a lawsuit seeking enforcement.

In conjunction with the lawsuit, community groups used the litigation as an organizing and public education tool. ANA provided resources to groups to help organize turnout at public hearings and produced materials for consistent messaging to the public and the media. The lawsuit process itself was unique in that Western States Legal Foundation, who was the plaintiff coordinator, made an agreement with NRDC that

[215] Interview with author.

decisions on the case would be done through coordinated decision-making. That is, rather than NRDC, as the lawyer, telling the other plaintiff groups what to do, decisions were made as a group. There were coordinated conference calls to discuss issues and ideas.[216] This allowed 38 grassroots organizations to use the case to write reports and raise money, not just for the litigation, but for their own organizational capacity based on involvement in the case. This was important because it came at a time when foundations were collapsing and thus there was less financial support available for grassroots groups. As the case brought forward new information, the groups then sent that information along to their communities and the press.

The DOE reached a $6.25 million settlement with the groups in 1998, which the groups used to establish a Monitoring and Technical Assistance Fund for communities affected by the agency's environmental remediation and waste management program. The settlement also required DOE to establish an Internet database providing access to information on the progress of remediation.[217] Jay Coghlan called the settlement "a major victory both for the environment and public participation." EM continues to maintain a publicly accessible database providing details contaminated sites, including waste type, volume, radioactivity and transfer and disposition plans. Under the agreement, DOE also agreed to complete environmental assessments and allow for public input of its plans for "long-term" stewardship at contaminated DOE sites. Through an extensive application process, the Monitoring and Technical Assistance Fund dispensed over $5 million to more than 40 citizen groups and Tribes so that they could conduct independent scientific

[216] Jackie Cabasso interview with author.
[217] Natural Resources Defense Council, "Settlement of the Contempt Action Against the Department of Energy," Washington, DC, December 14, 1998, http://www.nrdc.org/nuclear/9812doe2.asp.

and technical studies of DOE environmental management programs.[218] While the fund engaged a lot of groups, there were limitations on what the money could be used for and the fund created competition among groups for funding.

More broadly, ANA member groups noted that litigation under environmental laws has been most successful when it is part of a multifaceted strategy combining technical expertise, Congressional education and lobbying, and public education. More examples of the successful use of litigation are detailed in the case studies in chapters four and five. In general, however, many groups noted that lack of money and resources prevents them from litigating more than they have done. "Because it is so expensive, it has to be the last resort," according to Don Hancock.[219] Some groups also say they use litigation sparingly because the courts are not necessarily friendly as a result of the Supreme Court's 1984 opinion in *Chevron U.S.A., Inc. v. Natural Resources Defense Council*, which outlined a limited role for courts in reviewing agency interpretations and deference of courts to agency expertise. The view of the Supreme Court has trickled down to state courts and federal district courts. The laws, per se, are not necessarily stacked against community interests, but when individuals or organizations challenge federal agency implementation of the laws, because of *Chevron's* legal precedence, the courts defer to agency expertise. Thus, organizations that would like to legally challenge DOE's implementation of the law must overcome an approved legal bias that the courts are supposed to defer to the agency over the public.

Although there have been some successes, several interviewees noted that environmental laws do not go far enough and have even limited the ability of groups to

[218] For a full list of projects and links to reports, see Clark University, "History of the MTA Fund and The Collection," http://www.clarku.edu/research/kaspersonlibrary/mtafund/.
[219] Interview with author.

make a greater impact on the nuclear weapons complex. One ANA member called environmental laws a "mixed bag." While they legally require public participation opportunities, such as notices, hearings or comments, on the other hand public participation can be limited explicitly to the letter of the law. This has been problematic in the "decide-announce-defend" approach to policy-making, which places policy formulation in the hands of DOE, contractors and state regulators, only allowing for public input after policy decisions have been made. When communities have been involved in discussions before decisions are made, the so-called "announce-discuss-decide" model, communities feel that they have a greater say. As Tom Schneider of Ohio EPA put it, when decisions are made are made and defended to the public, "folks feel left out."[220] Decisions have less legitimacy from the perspective of communities. Incorporating the public in discussions while policies are being formulated can give decisions greater legitimacy.

At times, however, these laws are the only leverages communities have to try to impact what is happening. Scott Kovac of Nuclear Watch New Mexico commented that he had taken for granted U.S. environmental laws until he went to Russia to meet with activists in Tomsk and Chelyabinsk. According to Kovac, "They [Russia] don't have these kinds of laws. It made me consider how hard our work would be without NEPA. There would be no information about the sites. Without FOIA, we would have no way to get information. As limited and frustrating as the laws are, they're still useful. The public sharing of information keeps state regulators and sites from having their own little party without inviting others. Without the laws, there would just be smoky backroom deals that

[220] Interview with author.

we would only hear about after the fact."[221] Others also pointed out that communities are way under-resourced in terms of their ability to participate in decisions related to environmental remediation and waste management. The decisions are primarily made by federal and state agencies, that are beholden to the contractors doing the work, rather than the communities the agencies should represent, according to several community groups. Although the laws allow communities to comment, DOE and regulators are not always responsive. However, Don Hancock also noted that "ANA groups have used federal laws better than they were intended from the standpoint of the federal government, state regulators and the DOE."[222]

Another challenge of the federal environmental laws is that they are time intensive. It's a substantial time commitment to understand the laws and participate in commenting and permitting processes. According to Hancock, preparing comments for permits or an Environmental Impact Statement is "very time consuming and generally not very public friendly," largely as a result of scientific and technical information involved. Participating also requires attending hearings, which are sometimes held during regular work hours. Hearings also cover a lot of technical information and negotiating between parties, which may lead the public to lose interest.

ANA groups have worked with communities on occasion to strengthen laws and to force agencies to make the laws work better and to make public participation more meaningful than it otherwise would be. Some regulators have also been more willing to press for greater inclusion of communities in decisions. For example, Tad McCall who served as Deputy Administrator for Federal Facilities at U.S. EPA from 1991 until 1993

[221] Interview with author.
[222] Interview with author.

made a concerted effort to reach to communities and to bring them together to discuss how issues impacted them. The willingness of regulators to engage grassroots groups has also bolstered their legitimacy. ANA groups have viewed working with state and federal regulators as important. Several interviewees noted that groups use regulations to their advantage. So, for example, when federal regulations are stronger, they use them as leverage on states and where state regulations are stronger, groups use them as leverage to push for stronger federal regulations.

Conclusion

During the Cold War, DOE and predecessor agencies controlled access to policy making and framed the debate on nuclear weapons in terms of "national security." Beginning in the mid-1980s, focusing events – the seminal *Leaf v. Hodel* decision, the passage of the 1982 Nuclear Waste Policy Act, the Chernobyl disaster, revelations of environmental, health and safety concerns across the nuclear weapons complex, and the end of the Cold War – helped redefine nuclear weapons issues and elevate public consciousness of the negative environmental, health and safety legacy. By the late 1980s, DOE was subject for the first time to intense media and public scrutiny and Congressional inquiry. As more information became available, DOE could no longer insulate itself from criticism and the revelations showed that the DOE could not be trusted to regulate itself or act in the interests of the public. A movement for openness, accountability, and health and environmental justice mobilized under a wave of criticism to challenge and change DOE policies and practices. Once DOE became subject to regulation under federal and state environmental laws, policy-making was opened to

other actors, including the Environmental Protection Agency, Health and Human Services, state environmental and health agencies, and the public.

This chapter has traced the rise and alliance of grassroots organizations to empower communities impacted by the nuclear weapons complex, to raise public awareness and to press for policy changes at DOE. The network contributed to redefining nuclear weapons issues in terms of their negative environmental costs and the threats they posed to the health and safety of workers and the public. The network also helped mobilize support to change self-regulation and secrecy at DOE. Despite the scientific and technological complexity of the issues, and despite the fact that the contractor system poses challenges to accountability, the network has had some successes. Most notably, the network and its member groups successfully used environmental and information laws to obtain information, to expose problems and to mobilize and educate the public. As one analyst asserted, MPN/ANA was critical to getting DOE to agree that it was not in conformance with environmental laws, and that the complex wasn't safe.[223] That in turn led to facility closures and it has been difficult to resume production since. Essentially, the system has reached a policy stasis and opponents have been a constraining force on weapons production because of health, safety and environmental concerns.

Environmental remediation, waste management and health and safety issues remain long-term challenges that have yet to be resolved. However, maintaining media and Congressional attention to the issues remains a serious challenge. The issues are not as mainstream as they were in the late 1980s and early 1990s, even though the risks are great and the stakes are high. Absent media and Congressional scrutiny, grassroots

[223] Interview with author.

organizations that have been working for some thirty or more years now are the strongest ongoing force for accountability.

Grassroots community groups, even those who have been part of successful remediation efforts, expressed concern about the future of environmental programs. Because DOE is contractor-driven with roughly 90 percent of funds disbursed to contractors, cost-overruns on programs are legendary. Numerous interviewees asserted the culture of secrecy persists at DOE and that sufficient regulation and oversight of environmental and other programs remain illusory. As one interviewee put it, the "we-be" attitude, that is "we be here before you and we be here after you leave," is persistent among DOE and contractors at most sites. "DOE is an entrenched bureaucracy. To change the culture at DOE and among its contractors is a pretty tall order," observed one interviewee.[224] U.S. EPA and state agencies often do not have enough regulatory teeth to enforce agreements with DOE, thus the grassroots and community organizations that watchdog the sites are often the entities that call attention to critical issues.

Despite some successful uses of environmental and information laws, grassroots community organizations remain at an information disadvantage vis-à-vis DOE and its contractors. Grassroots organizations are also seriously under-resourced, especially as the donor base for such organizations has virtually disappeared. Only a few foundations now support work in this area. Many of the foundations that once supported the work of these groups have either spent down their funds, consolidated funding or redirected their attention to other issues that fit into their own agenda. The foundations that remain have become more controlling and demanding of the organizations they fund because they want "measurable results," which is often difficult to achieve in the short-term in this

[224] Interview with author.

policy area. There is also a challenge of attracting young talent to work in the organizations, partly as a result of the resource challenge and partly because the issue is not on the radar screen of the next generation.

Decision-making processes are far more open to the public than they were during the Cold War. Using regulatory laws, such as NEPA, CERCLA and RCRA, grassroots community organizations demanded a say in decision-making processes. In the 1980s and 1990s there were robust grassroots efforts all over the country and nuclear issues were a high priority because people were concerned. However, there has been less public involvement over time as the issues about remediation and waste management have become more technical. One less sanguine observer criticized the process, noting that especially since the 2000s, things have gotten in a comfortable pattern. "Public and environmental proceedings have become routinized. No one rocks the boat and nothing unanticipated happens. No one strays outside the bounds. I'm not impugning people's intentions, but it has become a little minuet. Like voting, cast your ballot, but it doesn't really make a difference."[225]

Meaningful public involvement opportunities remain a challenge at many sites throughout the complex because most contractors, though not all, are reluctant to embrace it, often deeming the public not expert enough. One means for countering the diminishing role of community and public input could be for DOE to require public participation as part of environmental remediation and waste management contracts, as recommended in a June 2015 report by the Energy Communities Alliance.[226]

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[225] Interview with author.

[226] Energy Communities Alliance, Changing Course: The Case for Sensible DOE Acquisition Reform, June 2015, http://www.energyca.org/PDF/AcquisitionReform.pdf.

The next two chapters take up in-depth case studies at specific sites to show how concerted long-term community involvement can make a difference in decision-making processes and policy outcomes.

Chapter Four: From Decide-Announce-Defend to Announce-Discuss-Decide: Fernald As Proving Grounds

This chapter is a case study in how the shift from an administrative-centered regulatory regime to a more pluralistic regime is implemented in practice. I examine how a federal agency, the Department of Energy (DOE), which had relied on managerial expertise, and closed, technocratic operations, was forced to adopt a more participatory regime. Specifically, I analyze the fight to open up the decision-making process regarding remediation at the Fernald nuclear site in Ohio to public participation. Compared with other sites in the nuclear weapons complex, the environmental remediation and waste management of the Fernald nuclear is considered by many to be a success story. There are many lessons to be learned from the remediation of the Fernald, above all, that after relenting to pressure, the DOE's decision and commitment to include the community in remediation decision making processes increased trust in the agency, legitimacy of decisions and better policy outcomes overall.

The success of opening up the decision-making process at Fernald was the result of a perfect storm of conditions. First and foremost, the Fernald Residents for Environmental Health and Safety (FRESH) pressed the DOE for more information and to open the process beginning in the mid-1980s when contamination in the drinking water wells of nearby residents was reported. As one EPA official observed, "The movement to cleanup Fernald began in Lisa Crawford's living room."[227] Costly litigation by the community, the state of Ohio, and by workers and subcontractors also put pressure on the DOE to open up the decision-making process, as did intense scrutiny by regulators and the media. In addition, by the early 1990s and with the end of the Cold War, the nation no

[227] Interview with author.

longer needed to produce as much uranium for nuclear weapons. As a result, the DOE ended production and closed the site, thereby removing the intense need for secrecy at the site. Finally, when Bill Clinton became president, he nominated Hazel O'Leary as Secretary of Energy. Two of O'Leary's top priorities at DOE were to cleanup the environmental contamination across the nuclear complex and to pursue an Openness Initiative at the agency, which included a push for greater public participation in decision-making. Fernald was a proving grounds for the administration's push for greater public participation and new managers came to site to experiment with the new philosophy.

After 1993, public participation at Fernald transformed from the "decide-announce-defend" approach that is far more common across the nuclear weapons complex to an "announce-discuss-decide" approach. This transformation contributed to greater buy-in from the community about decisions made, and contributed to a more efficient, less costly remediation. As Lisa Crawford of FRESH put it, "It took all of us working together – the local DOE folks who earned our trust, all the regulators, Congressional folks, even state and local officials. It came down to united effort in the last ten years. Prior to that, it was FRESH who kicked their door down and lit fire under their ass."[228]

This chapter begins with a background on the Fernald site and the health and environmental issues. I then discuss the factors that contributed to the DOE's decision to include the community in the remediation decision-making process. Above all, I demonstrate the role of FRESH beginning in the mid-1980s as it pressed the DOE for information about the site and demanded health and environmental justice for the

[228] Interview with author.

community. I also discuss FRESH's role participating in the decision-making process for the site's remediation, educating the public about the site, watchdogging DOE and the site contractor throughout the remediation process, influencing important decision makers and contributing to the national debate about health and environmental issues. I conclude with a discussion of the lessons learned from opening up the decision-making process at Fernald, and argue that direct public involvement in decision-making is both meaningful and can lead to better policy outcomes and solutions.

Site Background

The Fernald site, built on 1,050 acres (1.6 square miles), is located in rural southwest Ohio, about 18 miles northwest of Cincinnati. Established in 1951 as the Fernald Feed Materials Production Center (FMPC), the plant began operation in 1952 and for nearly 37 years, Fernald produced high-purity, low-enriched uranium for defense nuclear activities. Essentially, FMPC was the first step in the nuclear weapons production capability. From 1952 through 1989, Fernald served as the nation's uranium foundry and sent some 500 million pounds of highly purified uranium compounds and metal products for use as "feed materials" at other facilities in the nuclear weapons complex, including the Hanford Nuclear Reservation in Washington, the Savannah River Site in South Carolina, Oak Ridge in Tennessee and Rocky Flats in Colorado. Fernald converted uranium ore and recycled uranium scrap products into uranium metal shapes know as derbies. Fernald also machined uranium fuel cores for use in production reactors, which produced weapons-grade tritium and plutonium.

As a pivotal operation in the nation's national defense, the government maintained secrecy around FMPC's purpose and operations throughout the Cold War.

Residents near the site were unaware of the activities conducted at Fernald. In fact, many thought it was paint manufacturing plant, while others thought it was a dog food plant.[229] Because the public image had been secretive up until the end of the Cold War, "A lot of people seen the checkerboard chimneys, thought it was part, part of Ralston Purina, or that they made feed materials for animals."[230] As Lisa Crawford of the Fernald Residents for Environmental Safety and Health (FRESH) explained, "The community didn't know a lot about site for first three decades or so. There was a mystique about the site. Nobody had put two and two together to realize the site was a major part of the nuclear weapons complex."[231]

Many employees at the site also did not know what they were helping to produce. Posters around the plant warned employees not to share company information with strangers, family members or even co-workers.[232] As George Bassitt, a former worker explained, "You had to have a Q clearance and it was on, they had a sign posted on all buildings - only Q clear personnel allowed in this building. And you couldn't wander all over the plant. You had to stay in your plant where you was working. So you didn't know what went on in the other plants. I never found out what went on in any of the plants, till I

[229] "Roadmap to Resolution: Communities, Government and Corporations Solving Complex Challenges," Fernald Community Alliance, 2014, http://www.fernaldcommunityalliance.org/Roadmap-to-Resolution.html.
[230] Interview with Stan Chesley, Fernald Living History Project, Project Number 20012, Tape 86, September 9, 1999, p. 1, http://www.fernaldcommunityalliance.org/FLHPinterviews/Chesley.pdf.
[231] Quoted from "Roadmap to Resolution" (2014).
[232] Randy McNutt, "Fernald marks 50th anniversary, Ceremony points to cleanup effort," The Cincinnati Enquirer, Tuesday, May 08, 2001, http://enquirer.com/editions/2001/05/08/loc_fernald_marks_50th.html.

went and worked in them…I didn't know a thing about it [Fernald site operations]. It's like you said - build your future around atomic energy, is what they told us."[233]

Site Contractors

From Fernald's inception until 1985, National Lead of Ohio managed and operated the site. In 1986, DOE awarded the contract to Westinghouse Material Company of Ohio and it managed the site until December 1992. The relationship between Westinghouse and the community could be characterized as strained, at best. The DOE and Westinghouse were not prepared for the high level of public and media scrutiny, nor were they prepared for the environmental investigations. In 1992, Fluor Fernald, Inc. was awarded the contract to perform environmental restoration. Fluor Fernald's mission was to clean up the site and any offsite contamination in a safe, timely, and cost-effective manner.

As Fluor Fernald has noted, when it assumed management of remediation of the widespread contamination at the Fernald site in 1992, the social and political environment was extremely contentious as decisions about how to go about remediating the site began. Extensive news coverage of the contamination drew local and national attention from state and federal regulators, and from elected officials. Citizens did not trust DOE or its contractors and demanded an active voice in remediation decisions. Labor unions also expressed concern about safety the site, as well as their future role in remediation work. Lisa Crawford of FRESH remarked that, "The site didn't even have a DOE presence until 1987. Prior to that, it was run solely by the contractor. When Westinghouse became contractor, there was a DOE office with people from Oak Ridge,

[233] Interview with George Bassitt, Fernald Living History Project, Tape 17, Project Number 20012, May 9, 1999, p. 3, http://www.fernaldcommunityalliance.org/FLHPinterviews/FLHP-17Bassitt.pdf.

but it was a joke. Fluor was also a nightmare until we got good people and could establish a relationship. DOE then sent good public relations people."[234]

Environmental Contamination from Production

When Fernald began operating, James F. Chandler, the first manager at Fernald, vowed to the press and public that the new plant "would not create environmental toxic or radiological hazards."[235] In 1984, Fernald became in the poster child for the environmental legacy of the Cold War. The public image of the Fernald site changed when the Department of Energy (DOE) reported that a faulty dust collector at plant nine released nearly 300 pounds of enriched uranium oxide into the environment.[236] That same year, the DOE also confirmed uranium contamination had been found in three offsite wells in 1981. Residents, workers and the community were outraged. The revelations drew local, national and international media scrutiny.

Evidence of environmental contamination at the Fernald site mounted in September 1986 when a Congressional investigation uncovered documents showing that Fernald officials knew in 1960 that waste pits were contaminating the Great Miami Aquifer underlying the site with uranium. The Great Miami Aquifer is one of the largest drinking water aquifers in the country. It was a well-water source for residents living near the plant and a major drinking water source for people living in the region.[237]

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[234] Interview with author.
[235] Tim Bonfield, "History repeats itself," *The Cincinnati Enquirer*, February 11, 1996, http://enquirer.com/fernald/stories/021196c_fernald.html.
[236] Department of Energy, "The End of Secrecy," Fernald Closure Project, http://www.lm.doe.gov/land/sites/oh/fernald_orig/50th/secr.htm.
[237] Fernald Citizens Task Force, "Recommendations on Remediation Levels, Waste Disposition, Priorities and Future Use" (Fernald, OH: U.S. Department of Energy, 1995), p. 6.

In March 1987, more documents revealed that the U.S. Geological Survey had warned the Atomic Energy Commission of the ground water contamination risk in 1951. As a result of the revelations in 1986, the U.S. EPA began investigating ground water contamination under the Comprehensive Environmental Response, Conservation, and Liability Act (CERCLA/Superfund) and the Resource Conservation and Recovery Act (RCRA). Further enforcement of environmental laws during the mid-1980s shed new light on the health and environmental impacts of Fernald.

When production ceased in 1989, Fernald contained 6.4 million cubic feet of low-level waste in containers; 186,000 gallons of low-level liquid mixed waste; 31 million net pounds of nuclear product, 255 process-related and administrative structures; three concrete silos containing 13,990 cubic yards of low-level radioactive waste; six waste pits containing more than one million tons of waste; 400 acres containing 2.4 million cubic yards of contaminated soil and approximately 223 acres of a contamination plume in the sole-source aquifer beneath the site.[238] In total, the Fernald site produced some 1.5 billion pounds of radioactive waste during its operation. As cleanup progressed, the scope of contamination changed as new technologies were used, as waste treatment, process and support facilities were constructed, and as cleanup levels changed.

Before 1984, Fernald deposited solid and slurried wastes from its production processes in a Waste Storage Area located on the site. After the mid-1980s, as a result of increased national consciousness of the long-term health and environmental effects from nuclear weapons production, newly generated wastes at Fernald were stored in containers for eventual shipment off site.

[238] Fluor Government Group, Fernald Closure Project, 2007 Project of the Year Submittal, Project Management Institute, p. 4, http://www.pmi.org/About-Us/Our-Professional-Awards/~/media/PDF/Awards/Fernald%20Project%20of%20the%20Year%20Nomination.ashx.

Contaminants from material processing were released into the environment through air emissions, wastewater discharges, storm water runoff, leaks and spills. According to Tom Schneider, Supervisor of Ohio EPA's Division of Air Pollution and Control and Fernald/Paddy's Run Conservation Project Manager, "For about every pound of product they generated, they generated three pounds of waste. When the agency got involved, literally tens of thousands of drums were stacked all over site."[239] The waste in the drums had a low-ph, causing the drums to rust and leak. Uranium leaked out of the drums and into creeks and eventually into the Great Miami Aquifer, one of the largest sole-source aquifers in the nation. The EPA's "sole-source" designation means that if it is contaminated by radioactive and hazardous wastes, it would pose a significant health risk to humans.

Growing public concern, media scrutiny and political pressure to close and clean up the facility steadily mounted throughout the late 1980s. In 1986, the DOE entered into a Federal Facilities Compliance Agreement with the U.S. EPA that established the DOE as the site's responsible party and the EPA as the lead regulatory agency.[240] The FFCA initiated remedial investigation activities at the site and established a timetable for removing radioactive and hazardous wastes from the site. By the end of the Cold War and with less need for uranium products, the DOE ceased uranium production at Fernald in 1989. In December 1989, Fernald was added to the National Priorities List of Superfund sites most in need of cleanup. In February 1991, DOE announced its intention to end the

[239] Quoted from "Roadmap to Resolution" (2014)
[240] United States Environmental Protection Agency, "Success Story: Fernald Preserve" (Fernald, Ohio: U.S. EPA, June 2010), p. 5, http://www.epa.gov/reg5sfun/redevelop/pdfs/Fernald_Preserve.pdf.

production mission at Fernald and Congress formally approved the end of production in June 1991. The mission at the site was then changed to remediation and waste management. The site was officially renamed the Fernald Environmental Management Project in 1991 to reflect the shift in the site's mission from uranium production to environmental remediation.

Suing for Health and Environmental Justice

Years of uranium metal production and on-site storage of waste and nuclear material left the soil, ground water and buildings contaminated. When she first saw the site with waste everywhere and open waste pits, local resident and FRESH member Pam Dunn remarked that she thought to herself, "If I did what you did, I would be in prison and they would throw away the key."[241] Dunn's comment reflects the double standard in the application of U.S. regulatory laws to federal facilities for decades. Because it was a federal facility, until the 1990s, the DOE held to the belief that the maintenance of national security received priority over environmental laws and the agency considered exempt from local, state and federal environmental laws. The DOE also indemnified its contractors from liability and punitive damages. As Stan Chelsey, the lawyer who represented the community and the workers in separate class-action lawsuits put it, "Everything was under the word production, production, production, and nothing having to do with Safety…. [Y]ou can't run a hot dog plant without having federal inspectors… [T]here was no on-site monitoring by…the DOE…. You can't do one day [without inspections] in a meat-packing plant. So they're making nuclear weaponry, with nobody there

[241] Quoted from "Roadmap to Resolution" (2014).

inspecting. No monitoring. They [the DOE] would rely totally on their [the contractor's] records, and their records were bogus."[242]

As a result of the extensive contamination at the site, the DOE's secrecy in addressing the contamination and the agency's failure to regulate itself, local residents, the state of Ohio, and DOE workers and contractors filed lawsuits. In January 1985, Lisa Crawford and five other residents filed a class-action lawsuit against National Lead of Ohio on behalf of 14,000 persons who lived within a five-mile radius of the Fernald nuclear site. According to Stan Chelsey, the lawyer who represented the community, he devised the legal strategy to charge the contractor for the contamination problems instead of the DOE because the agency could claim sovereign immunity.[243] The residents said the main impetus behind the lawsuit was to get information. For example, Pam Dunn recalled that after she attended some of the first public meetings about contamination at Fernald, it prompted her to get involved with the lawsuit because she wanted the information.[244] Dunn said the community was angry and wanted to know what really happened at the site.

The lawsuit filed by the community was important for several reasons. First, the lawsuit helped draw national media attention, which in turn drew local media attention and helped to educate the public about the health and environmental issues at the site. The lawsuit also helped to "arouse Congress' ire," as Stan Chelsey put it. The lawsuit spurred Congressional investigations, which forced the DOE to respond to questions about the site and reveal the extent of contamination. That information revealed in

[242] Interview with Stan Chesley, Fernald Living History Project, Tape 86, September 9, 1999, p. 5, 9 http://www.fernaldcommunityalliance.org/FLHPinterviews/Chesley.pdf.
[243] Stan Chelsey, Fernald Living History Project (1999).
[244] Interview with Pam Dunn, Fernald Living History Project, November 30, 2000, Tape 17/18/19, p. 2.

hearings helped guide what needed to be done in terms of remediation. Prior to the lawsuit, the government and its contractors refused to even acknowledge there was a problem, and so nothing was done to address health and environmental issues. According to Chelsey, "[Y]ou could get nothing done when you had governmental agencies and contractors saying 'gee, there's no problem. It's perfect. Everything's great. Nobody's getting sick. There's nothing going on out here.' Once there was a recogni[tion] that there was a problem, and it had to be cleaned up then you could move to positive business."[245] Among other issues about contamination, the lawsuit revealed that Fernald had been used as a dump site for radioactive waste that wasn't produced there. According to Chelsey:

> "Every time it rained, it rained on the radioactive metal and it went right into the water stream. So what no one realizes, they were using Fernald not only as a facility to machine…uranium, they were also using it as a giant dumpsite. I mean, right in everybody's backyard. And so when the FRESH group complained, nobody was paying attention.
> So they had tons and tons of debris that was radioactive, that was never generated from Fernald. For example, you saw, it looked like erector sets out there. It was quite phenomenal. And there were metal materials, it was a…giant radioactive junkyard. Over and above the barrels and the containers and so forth. But they were for example, storing thorium in a Quonset hut that was leaking. And most of that thorium … had never been used at Fernald. [T]he K-65 Silos…were acting as a storage facility."[246]

The community believed that because the lawsuit revealed information about the contamination, it constrained future land uses, thereby protecting the future health and environmental from the risks posed by the contamination on site. If not for the lawsuit, the DOE might have sold the contaminated land and people could have built homes on the land, for example. This is not far fetched. For example, even though they had good

[245] Stan Chesley, Fernald Living History Project (1999), p. 6.
[246] Stan Chesley, Fernald Living History Project (1999), p. 1-2.

intentions, records drawn out from the lawsuit revealed the DOE had donated a radioactive contaminated dump truck to a local school.[247]

Members of the community did note that the lawsuit took a toll on them. They were put through a great deal. Investigators toured their homes, looked into their finances and even put plaintiffs through psychiatric evaluations. They were also called to testify. As Lisa Crawford put it, "They were looking for something bad to hold against us. They were on a big fishing expedition, but they didn't find anything."[248]

The citizen suit was eventually settled in 1989 after a summary trial and DOE agreed to pay $73 million for emotional distress, medical monitoring, residential real property diminution and legal and administrative costs, and an additional $5 million for commercial and industrial real property diminution claims for property within a five-mile radius of the Fernald site. According to Stan Chelsey, the lawyer who represented the community in the lawsuit, "[W]e got medical monitoring which has been very, very helpful. And it was probably one of the pilot programs of medical monitoring." [249] Chelsey also acknowledged that it was FRESH who led the fight, "But none of this could have taken place but for the support of FRESH. They were right and they were on the cutting edge."[250] According to Lisa Crawford, the point the lawsuit wasn't the money, "The point was they admitted that what they had done was wrong. They admitted that they had knowingly and willingly contaminated this community but there wasn't a damn thing any of us were going to be able to do about it because they were the

[247] Stan Chesley, Fernald Living History Project (1999), p. 10.
[248] Interview with author.
[249] Stan Chesley, Fernald Living History Project (1999), p. 5.
[250] Stan Chesley, Fernald Living History Project (1999), p. 5.

government."[251] The bigger payoff, according to Crawford, was that after the lawsuit, the DOE knew not to mess with them anymore.[252]

In 1986, the state of Ohio filed claims against the DOE for violations of multiple environmental regulations, including natural resource damages, and included a $206 million dollar claim for damages. The state of Ohio alleged that the DOE did not properly dispose of hazardous and radioactive wastes while operating the Fernald facility, and as a result released radioactive materials into the surface, air and water, and polluted surface and ground water. The suit charged that the DOE violated state and federal environmental laws, including the Clean Water Act of 1972 (CWA) and the Resource Conservation and Recovery Act of 1976 (RCRA). The DOE moved to have the suit dismissed and asserted it had sovereign immunity from liability for "punitive" fines imposed to punish past violations. In 1988, the United States District Court of the Southern District of Ohio denied the motion to dismiss and found that the CWA and RCRA waived federal sovereign immunity from punitive fines.[253] The case was appealed to the United States Court of Appeals for the Sixth Circuit in Cincinnati, which found that the waiver of sovereign immunity and the CWA extends to civil penalties under federal law or state water pollutions laws. It also found that citizen suit provision of RCRA waivers sovereign immunity for civil penalties.[254] The case was then appealed to the United States Supreme Court, which ruled in a 6 to 3 vote on April 21, 1992 that Congress had not waived the federal government's sovereign immunity from liability for civil fines

[251] Interview with Lisa Crawford, Fernald Living History Project, August 17, 1999, p. 16.
[252] Interview with author.
[253] *United States Department of Energy v. Ohio*, 689 F.Supp. 760 (S.D. Ohio 1988).
[254] *United States Department of Energy v. Ohio*, 904 F.2d 1058 (6th Circ. 1990).

imposed by a state for past violations of the CWA or RCRA.[255] The decision was a watershed moment as the Supreme Court definitively resolved ongoing contentions about the federal government's claims to sovereign immunity from violations under environmental laws. Indeed, the Supreme Court found that Congress had "not explicitly exempted federal facilities from violating state and environmental laws."[256] As discussed in chapter two, after the Supreme Court decision, Congress passed the Federal Facilities Compliance Act of 1992 making clear that federal government was not exempt from complying with local, state and federal environmental laws. The FFCA also enabled EPA and state governments to impose fines and compliance orders against DOE and other agencies if they failed to comply with provisions of federal environmental laws.

Twenty-two years after the state of Ohio filed the lawsuit against the DOE, the state and the agency signed the *Consent Decree Resolving Ohio's Natural Resource Damage Claim* under Section 107 of CERCLA. In 2008, DOE agreed to pay $13.8 million to settle the lawsuit and pledged to spend the money to restore the wetlands, prairies and forests on the 1,050 acres of land at the site to their "pre-settlement habitats."[257] The settlement was on top of the $4.4 billion spent to remediate the site and in addition to $14 million spent to repair damage to soil and surface waters at Fernald. The settlement was the largest amount ever attained by OEPA for a complaint over natural resource damages.

A third lawsuit was filed in 1990 by a group of former Fernald Workers and subcontractors. It was a class-action lawsuit against National Lead of Ohio (NLO) and

[255] *United States Department of Energy v. Ohio*, 112 S. Ct. 1627 (1992).
[256] *Congressional Quarterly Almanac*, "Federal Agencies Liable for Waste Violations," One-Hundred-and-Second-Congress, First Session, Volume 48:261, 100-H, 1992.
[257] Cincinnati Business Enquirer, Ohio EPA settles Fernald suit, Jul 8, 2008 http://www.bizjournals.com/cincinnati/stories/2008/07/07/daily24.html.

National Lead Industries, which had operated and managed the site from 1951 until 1985. The lawsuit, which sought $500 million in damages, charged that the companies intentionally subjected workers to radiation hazards at Fernald and deliberately concealed dangers from them. Workers claimed that they suffered emotional distress from fear of getting cancer or leukemia. NLO maintained that workers were not exposed to extraordinary health hazards and that it followed the best available practices.

In August 1994, the government, while admitting no wrong doing, agreed to a $20 million settlement that included $5 million for lifelong medical monitoring for workers.[258] Unfortunately, the workers had a greater uphill battle in their lawsuit. In retrospect, Stan Chelsey said the workers should have filed their lawsuit earlier, but unions were afraid that if there were a concerted effort of lawsuits, workers would lose their jobs. Because they had been told not discuss their work with anyone, workers were also afraid that if they came forward with their stories, the FBI would investigate, indict and send them to jail. According to Chelsey, "Many of them weren't even high school graduates. They were factory workers. Wonderful people, salt of the earth, they were afraid. They were intimidated."[259]

The case was significant because it was the first legal victory won by any group of atomic workers.[260] Furthermore, the trial revealed many documents demonstrating unsafe practices at Fernald for decades. The Institute for Energy and Environmental Research (IEER) conducted a study that was delivered as part of expert testimony in the trial. IEER found that working conditions, especially in the 1950s and 1960s, were

[258] Sharon, Cohen, "Nuclear Workers Win; Their Health Still Loses," Associated Press, October 9, 1994, http://articles.latimes.com/1994-10-09/news/mn-48170_1_fernald-workers.
[259] Interview with Stan Chesley, Fernald Living History Project, Project Number 20012, Tape 86, September 9, 1999, p. 7, http://www.fernaldcommunityalliance.org/FLHPinterviews/Chesley.pdf.
[260] Bonfield, 1996.

appalling and typified by high air concentrations of uranium in many areas of the plant. According to IEER, air concentrations exceeded the federal government's Maximum Allowable Concentration (MAC) by tens, hundreds and sometimes even thousands of times. IEER showed one document from the 1960s that listed the air dust concentration in the breathing zone of worker cleaning under a certain piece of equipment as 97,000 times the MAC. IEER concluded that doses due to uranium inhaled by workers between 1952 and 1962 were above the then-allowable limits in more than half the cases in every year except one. In 1955, the worst year for worker exposure, IEER estimated that almost 90 percent of workers were exposed to more than the allowable lung dose limit. IEER's analysis also showed that Fernald workers were not told about their internal radiation overexposures by the DOE or its predecessor agencies nor by contractor officials until at least 1989. One of the more startling findings, according to IEER, was that the urine and lung counting data (in other words, internal dose measurements) of the Fernald workers had never been converted into radiation dose estimates. As a result, worker radiation dose records, which are the records actually given to workers when they ask for them, only contained external radiation doses, such as those recorded on film badges worn by workers. Thus, assurances given to workers that they were well-protected were based on partial information and did not take account of the most important route of exposure, inhalation of contaminated dust.[261]

Worker testimony during the trial also revealed other patterns of unsafe practices. For example, Angelo Gallina, a worker, testified that he was severely burned by uranium-laced acid when he tried to clear a clogged chute with a sledgehammer. Instead of

[261] Arjun Makhijani, "Fernald Workers' Radiation Exposure," *Science for Democratic Action*, Vol. 5, No. 3, October 1, 1996.

sending him to the hospital, he was treated at the site's first aid station for two weeks so that NLO would not have to report a lost work time accident.[262] Stan Chelsey, one of the lawyers who represented the workers in the lawsuit, also recalled testimonies from his clients:

> "They would go home with radioactive materials all over their clothes and not be allowed to tell their wife and kids. They tramp it into the house. For example we had one incident beyond belief. [They were] in a very radioactive environment, they had limited air-conditioning so all the windows in the dining room were open. So people were eating their lunch in the dining room in the areas where you're suppose to eat, and all this stuff is blowing in the windows. I mean, it's something that no one can believe."[263]

Other documents revealed in the trial showed that Fernald managers were aware since the 1960s that workers were exposed to potentially dangerous levels of radioactive uranium dust and other hazards, but didn't take corrective action. The trial also confirmed that managers at Fernald used a correction for measuring buildup of radioactive-dust levels on workers' dosage badges. In some cases the correction was so large that some workers actually had negative radiation readings. A House of Representatives subcommittee on oversight and investigations released documents in 1994 that also showed that workers were given virtually no reliable information about the health risks they faced. Internal reports from Fernald showed that uranium concentrations at Fernald were hundreds of times, sometimes as high has 650 times, above government limits.[264]

The lawsuits reflected the public's distrust of DOE and its contractors. The lawsuits also contributed to a very tense political environment as decisions were being

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[262] Gary Lee, $20 Million Settlement Reached Between Nuclear Plant Workers, Energy Dept.," Washington Post, July 27, 1994, http://www.washingtonpost.com/archive/politics/1994/07/27/20-million-settlement-reached-between-nuclear-plant-workers-energy-dept/e99368ac-7518-4cc2-a352-e778c4345308/

[263] Interview with Stan Chesley, Fernald Living History Project (1999), p. 7.

[264] Bonfield, 1996.

made about how to go about remediation. Litigation was also costly as DOE spent hundreds of millions in legal expenses and court settlements. More importantly, the lawsuits brought by the community, the state of Ohio and the workers were an important reason DOE decided to pursue greater openness about decisions at Fernald, and at other sites in the nuclear weapons complex. Tom Schneider of Ohio EPA said that the lawsuits were the means by which the DOE were required to address the concerns of the community, workers and the state.[265] Without the litigation, the DOE would not have been as hospitable to public involvement and they would not have gotten the remediation started.

Under Pressure from Above

As the Cold War ended, the need for production decreased and it became imperative for the Bush and Clinton administrations to lift the veil of secrecy and address the health and environmental legacy of nuclear weapons. With increased scrutiny from the public, media, Congress and regulators, it became a priority of the Bush and Clinton administrations to change the DOE's policies and practices regarding public participation in decision making processes for environmental remediation. A February 1991 study by the Congressional Office of Technology Assessment evaluated the health and environmental contamination problems. The study asserted that DOE needed to make significant changes to it practices "to develop credibility and public acceptance of its plans for waste management and environmental restoration." To achieve the changes, the report urged "aggressive efforts" in the following areas:

> "Substituting independent, external regulation for DOE self-regulation wherever feasible; providing long-term, capable, independent oversight in matters for which DOE continues to retain primary responsibility; making information openly

[265] Interview with author.

> available and easily accessible to the public; and promoting active and continuous public involvement -- at the National, State, regional, and local levels -- in decisions about waste management and environmental restoration objectives, priorities, and activities."[266]

James Watkins, Energy Secretary during the Bush administration, took tentative steps to address to increase public trust and confidence in the DOE and its programs, including the creation of an agency task force. Watkins acknowledged that as a result of the agency's national security mandate, there were numerous lapses in its past practices across the weapons complex including "inattention to the environmental implications of its activities, excessive secrecy about releasing health and safety data, dissembling about the effects of above-ground nuclear weapons tests, and an inadequate record in consulting with many who were affected by policy choices."[267] Among other things, Secretary Watkins' task force recommended:

- "Early and continuous involvement of state and/or local advisory groups as well as national advisory bodies on which a broad range of stakeholders (including, but not limited to the nuclear industry, electric utilities, public utility commissions, potential host and corridor states, communities, and tribes, environmental and public interest groups) are represented. That involvement would be characterized by frequent contact, complete candor, rapid and full response to questions, use of at least some suggestions, and assistance in increasing the technical and oversight skills of the community; …
- Consistent and respectful efforts to reach out to state and community leaders and to the general public for the purpose of informing, consulting, and collaborating with them about the technical and operational aspects of Departmental activities…" [268]

[266] U.S. Congress, Office of Technology Assessment, "Complex Cleanup: The Environmental Legacy of Nuclear Weapons Production," OTA-484 (Washington, D.C.: U.S. GAO, February 1991), p. 9.
[267] Secretary of Energy Advisory Board, "Earning Public Trust and Confidence: Requisites for Managing Radioactive Wastes," Final Report of the Secretary of Energy Advisory Board Task Force on Radioactive Waste Management (Washington, DC: U.S. Department of Energy, 1993), p. 1.
[268] Secretary of Energy Advisory Board (1993), p. vii.

When Bill Clinton became president, he nominated Hazel O'Leary as Secretary of Energy and stated that she understood that the DOE's biggest problem was that it held "very little credibility out here in the heartland."[269] When O'Leary assumed office in 1993, she was committed to making the agency more responsive to the public. In her nomination hearing, she affirmed that cleaning up contamination at sites in the nation's nuclear weapons complex was one of the administration's priorities. As John Applegate, chair of the Fernald Citizens Advisory Board, put it, "When Bill Clinton became president and Hazel O'Leary became Secretary of Energy, they were determined to open it up. Fernald needed openness most."[270] Similarly, Doug Sarno, the consultant who was hired as a technical advisor to the Fernald Citizen's Task Force observed that the DOE had been under pressure for years at the site to open it up to public participation. With the administration change, "there was a new Energy Secretary who was willing to try to be more open and engaged with the public."[271] As a result, new managers with new philosophies about public engagement were sent to the site.

The administration hoped that revealing more information and opening up the decision making processes to public participation would result in fewer expensive lawsuits against the agency and help restore public confidence. As one member of the Fernald community remarked, "No one trusted DOE. There was a Cold War mentality.

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[269] Aaron Epstein and Owen Ullmann, "Clinton Picks 2d Woman For A Cabinet Post The President-elect Named Hazel O'leary And Dick Riley To The Cabinet, Then Criticized The "Bean Counters" Pressuring Him To Choose More Women," *Philadelphia Inquirer*, December 22, 1992, http://articles.philly.com/1992-12-22/news/25992442_1_cabinet-women-s-appointments-energy-post; Rudy Abramson, "O'Leary Surprised but Not Unaware : Nominee: Friends say Clinton's choice for energy secretary had not expected Cabinet post. The utility executive had worked on Ford and Carter staffs," *Los Angeles Times*, December 22, 1992, http://articles.latimes.com/1992-12-22/news/mn-2506_1_energy-secretary.

[270] Interview with author.

[271] Interview with author.

All of sudden the Cold War stopped and the questions became 'What do we need going forward to maintain adequate nuclear deterrent?' 'How are we going to change the site's mission?' The community was up in arms because they didn't know situation at the site and the DOE wasn't forthcoming. There were legitimate reasons it was a secure site during the Cold War, but the culture of secrecy pervaded DOE and that created distrust in the community."[272]

The Role of Community-Based Interest Groups

In 1984, a local journalist reported that Fernald had released large amounts of radioactive dust into the atmosphere and that the drinking wells of several local residents had been contaminated with uranium. That same year, the government officially informed Lisa Crawford that her family's well had been contaminated. Even worse was the fact the DOE and its contractors had known about it since 1981, but sent annual reports to Crawford's landlord stating that tests of the well had proved that the water was not contaminated.[273] Crawford said that the media began showing up on her doorstep and asked her what she thought about the site and the revelations of contamination.[274] She told the media she couldn't really respond because she didn't know much about the site. Crawford then set about to educate herself and attended one of the meetings of Fernald Residents for Environmental Safety and Health (FRESH) to learn more about the site and what was happening. FRESH is a community organization comprised of local residents who led the call to remediate the site and the aquifer. Lisa Crawford explained what catalyzed her involvement:

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[272] Interview with author.
[273] Tim Bonfield, "History repeats itself," *The Cincinnati Enquirer*, February 11, 1996, http://enquirer.com/fernald/stories/021196c_fernald.html.
[274] Interview with author.

> "DOE told us our well was contaminated and that they had known about it for five years. My kid was 8 and it infuriated me. That's when I really got involved. When it touches you personally, it kicks your ass into action. I went to the very first public meeting. I had a pink sweatshirt on and I was pointing my finger at them. They told us the contamination was well below safe limits. I took a jug of water with plastic cups and offered it to them, but they wouldn't drink it. I said, 'If you won't drink it, why should we?"[275]

Several members of FRESH recounted that in the early years people living near the site were scared and angry. Their response to the government when the issues were revealed was "how dare you." The beginning of public participation was an angry reaction. From the DOE's perspective, Jack Craig, provided his account of his first public meeting at Ross Junior High School:

> "My impression was that I was glad I wasn't at the podium that night … I remember thinking I was hoping I never would have to get up in front of the audience like that because it was very contentious. There was a lot of things going on at that time as far as lawsuits. I think the Department wasn't providing information very well at that time. I think the community was looking for a lot of information and the Department just wasn't in a position … both policy-wise and even organizationally-wise to provide that to them. So they were upset, rightfully so, and I had never personally had any experience in dealing with the public like that. I had very little experience in dealing with the public in general and certainly not a public that was upset like FRESH was at that time."[276]

When Lisa Crawford took over as head of FRESH in September 1985, her goal was to move the organization into a grassroots movement that would make environmental contamination and health safety at Fernald a national issue.[277] FRESH motivated community members attend public meetings and told them it was opportunity to be heard. FRESH warned the community that if they were not engaged, then they couldn't come in at the end of the process and complain. They encouraged the public to be part of the

[275] Interview with author.
[276] Jack Craig, Manager, DOE-Fernald, Ohio Field Office, Fernald Living History Project, March 9, 2001, http://www.fernaldcommunityalliance.org/FLHPinterviews/Craig-final.pdf, p. 10.
[277] Kathy Meyer founded FRESH as a community organization in late 1984, but asked Lisa Crawford to take over as head of the organization in September 1985 as she was about to have a third child.

planning process. When asked about FRESH's biggest accomplishment, Pam Dunn responded:

> "Public participation[.] I guess I would probably have to put at the top. I mean because that was a big thing that we kinda pushed for too. And maybe it was an automatic with the strive to get the information and get educated and learn what was going on. But to be involved. I mean because in the beginning and early years we called it the 'Decide Announce Defend' mode of DOE. They made the decision, announced it and then just defended it. There were no discussions on anything."[278]

Lisa Crawford agreed that educating and getting the community involved was FRESH's greatest contribution:

> "Fighting the good fight for all of us was getting correct data and information to the community, involving our community in what I call the good fight, encouraging people to come and participate, to come to the meetings and ask questions, and offer public comment, really getting people engaged and involved in this issue. Because seven women can't fight the fight for everybody. That was a huge success for us."[279]

Indeed the regulators, the DOE and contractors noted that FRESH was the greatest driver for public involvement in the remediation decisions. According to Jim Saric, "FRESH was a very educated citizens' group that was very concerned and very outspoken and would not step aside. They were not going to take 'no' for an answer. They were not going to back off and they would not be pushed away. Being active, organized and driven and using all the resources they had forced the DOE to respond. DOE knew by then that 'decide and defend' wasn't going to work."[280] Dennis Carr, Former Fernald Site Deputy, also shared this perspective when he observed, "It was their investment, day after day, and our public meetings and reading our reports and cutting through them, and interacting with us as we went along and then reporting to the

[278] Pam Dunn, Oral History Interview, p. 8.
[279] Quoted from Roadmap to Resolution (2014).
[280] Interview with author.

community at large that changed it."[281] Similarly, Graham Mitchell of Ohio EPA remarked, "FRESH has been a key stakeholder group and you know probably a clearly a leader in this area both locally and as well as nationally. Lisa Crawford and her group have…led a lot of the public concern about this site. And also they've been involved in national issues…they've educated people outside this area and also in other states. And they've also been educated by them as far as how other states feel about Fernald's material."[282]

Under pressure from citizen groups, the mindset at DOE changed and the agency pursued a different strategy of community engagement after 1993. As Steve McCraken, site director for the U.S. Department of Energy, put it, "Local residents, regulators and workers demanded an equal voice in cleanup decisions that affected the environment and their communities."[283] Although DOE was required by regulation to have large community meetings and to disseminate information, they realized they had to do more and directly involve the management in public engagement. DOE realized they had to build trust with the community. Jeff Wagner, a DOE Public Affairs Manager at Fernald, said, "[We] realized that if you build trust, if you do something that undermines that, you could easily go back to the starting line."[284]

In the early years of environmental remediation, DOE followed the minimum regulatory requirements for communication with the public, but the community clamored

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[281] Quoted from "Roadmap to Resolution: Communities, Government and Corporations Solving Complex Challenges," Fernald Community Alliance, 2014, http://www.fernaldcommunityalliance.org/Roadmap-to-Resolution.html.
[282] Graham Mitchell, former Ohio Environmental Protection Agency regulator, Oral History Interview, Fernald Living History Project, September 9, 1999, http://www.fernaldcommunityalliance.org/FLHPinterviews/Mitchell.pdf, p. 14.
[283] Quoted from "Roadmap to Resolution" (2014).
[284] Quoted from "Roadmap to Resolution" (2014).

for more information and greater involvement in remediation decisions. In 1993, DOE and its contractor, Fluor Fernald Inc., created a new public participation strategy to engage citizens and interested stakeholders early in the decision-making process. The strategy included both increased dissemination of information to the public and two-way communication between DOE, Fluor and the community. According to John Bradburne, Former Chairman and CEO, Fluor Fernald, Inc., "What I wanted to do was to bring them in and give them as much information as they could stand, so the more information I gave them, the more information they would understand what was going on…I knew that we had to work together or we were never going to make it….We gave information on a project or a series of projects and we listened to the feedback."[285]

Public participation at Fernald after 1993 went beyond the "decide-announce-defend" approach that is far more common across the nuclear weapons complex and instead pursued an "announce-discuss-decide" approach to decisions for the site's remediation. Fluor and DOE changed their approach to include the community early in the remediation decision-making process because the community demanded it. According to Lisa Crawford, "Fluor saw the vision that the community could help them in some way."[286] Eventually DOE and Fluor communicated with FRESH on nearly a daily basis. According to one regulator, this was because Lisa Crawford and FRESH were adamant about open communication. Graham Mitchell of Ohio EPA recalled, "Lisa Crawford was adamant, I mean, she would really, really yell at these people at meetings about why hide this stuff, why not just tell us. If it's bad news, tell us. If things aren't working right, tell us. And I think eventually that got through…and DOE started being very open….I think

[285] Quoted from "Roadmap to Resolution" (2014).
[286] Interview with author.

if the site has a problem Lisa Crawford gets a fax…of a daily incident report or something like that. If it occurs she gets that. She probably gets it before a lot of other people get it."[287]

One FRESH member recalled how the daily contact changed the interaction between the community and DOE and Fluor. Pam Dunn noted that there was shift from when "…the very first documents were done, the response summaries were almost as thick [as the document] because of all the public comments that they would have to respond to" to the situation in which DOE and Fluor brought the community in at the beginning of the decision-making process and "there were a lot less comments" because "everything was worked out before you got to that point."[288] The increased communication and interaction between the community and DOE and Fluor allowed concerns to be addressed before a proposed solution, allowing the community to influence the solutions in the formation process rather than just reacting to proposals put forth by DOE and Fluor.

By opening up the decision-making process and having more ongoing interaction with the community, decisions that were made about remedies and solutions had greater legitimacy. In addition, public trust in DOE increased. According to Jack Craig, who served as DOE's field office manager at Fernald, "I think we have turned skepticism, really negative attitude from the public toward the Department…almost 180 degrees. I think the public supports what we're doing here, they feel they're involved. I know that

[287] Graham Mitchell, Fernald Living History Project (1999), p. 20.
[288] Pam Dunn, Fernald Living History Project (2000), p. 16.

we make an effort to make sure that we're listening and I think what we've learned is that by all working together we've come up with a much better program."[289]

To give a concrete example of how trust increased, one regulator recalled how when public meetings were first convened, DOE would try to break the meeting up into smaller, divided sessions. FRESH members refused to let that happen because they didn't trust that DOE would give all the information. Gradually trust developed as DOE and Fluor pursued greater openness, open communication and sharing of information with the community, and eventually meetings could be subdivided.

It is important to note that over time, broad public participation decreased. When the DOE first began holding public hearings, DOE officials recalled that hundreds of people from the community would attend. Although the decision-making process became more open, decisions also became more technical, public attendance at DOE meetings decreased. FRESH's role, then, was perhaps more important as it represented the community in the more technical meetings and relayed information back to the community through organizational meetings, newsletters and flyers. Lisa Crawford noted that, "The community showed a humongous commitment. People really did stay involved. It became our baby and wanted to see it through to the end."[290]

FRESH not only played a role in pushing public participation, but also in defining what it really meant. They did not like the DOE's term "stakeholder." According to Crawford, "We're community participants, we're not stakeholders…We have a stake and a say in it but a stakeholder takes away the, the personal part for me… We worked

[289] Jack Craig, Fernald Living History Project, March 9, 2001, p. 13.
[290] Interview with author.

with…U.S. and Ohio EPAs, we worked with the site, we worked with the DOE."[291] Several sources also confirmed that Lisa Crawford and Pam Dunn and the core people from FRESH were very influential participants in the remediation decision-making process. EPA's Jim Saric said, "They attended every public meeting, they spoke up and they took notes. And they did it in a way that they were just complaining, but they offered solutions."[292]

Other regulators noted that FRESH was very influential in process because they were well-connected with other organizations and with members of Congress. As one EPA official remarked, FRESH had "a straight line to DC that others didn't have."[293] Another social scientist who studied FRESH observed that the organization "clearly had the consent and support of influential members of Congress, and this legitimated its position and made ignoring this organizational public very difficult for the U.S. DOE."[294]

From its founding, FRESH sought to develop relationships with their Congressional representatives, including then-Senators John Glenn and Howard Metzenbaum, as well as Representatives Tom Luken and George Voinovich. FRESH demanded the Congressional delegation represent the community. Crawford recounted that one of the things that helped court members of Congress was that FRESH focused on the environment, health and safety of the community. FRESH believed it was strategic to not take an anti-nuclear position as other groups were doing because that position was not supported more broadly by the Fernald community, which is more conservative. As such, they were able to work with both Republicans and Democrats.

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[291] Lisa Crawford, Fernald Living History Project (1999), p. 17.
[292] Interview with author.
[293] Interview with author.
[294] Maribeth S. Metzler, "The Centrality of Organizational Legitimacy to Public Relations Practice," in *Handbook of Public Relations*, ed. Robert L. Heath (Sage, 2001), p. 331.

Working with their Congressional delegation, FRESH was first able to tour the site in 1986. Members of Congress also set up hearings and invited members of FRESH to testify. In their testimonies, FRESH members Kathy Meyer, Lisa Crawford and Vicky Dastillung all testified their belief that the DOE had failed to regulate itself and protect the public. Dastillung, for example, told a House of Representatives committee, "while working to protect the nation, the government neglected to simultaneously protect the citizens' rights to a safe and healthy environment."[295] They called on Congress to act to force DOE to change the way in which the agency communicated with and related to the community. In hearings, FRESH's congressional delegation asked questions of the members that would allow them to discuss DOE's disregard for the health and environment of the community.

During the 1992 presidential election, FRESH members also contacted the Clinton-Gore campaign. FRESH told the campaign their concerns about the site and asked for greater openness.

Getting DOE to communicate more openly and to make decision-making process for Fernald's remediation more participatory was the not end of FRESH's involvement. Indeed, it was only the beginning. FRESH continued to watchdog the remediation of the site, and sounded the fire alarm when things were amiss at the site or milestones that DOE and Fluor agreed to weren't met.

Tom Schneider of Ohio EPA said that one of Lisa Crawford's strengths was that she knew how to play the federal budget game.[296] FRESH made an effort to understand

[295] Vicky Dastillung, Testimony, Hearing before the Subcommittee on Transportation, Tourism, and Hazardous Materials of the Committee on Energy and Commerce, House of Representatives, One Hundredth Congress, second session, 1988.
[296] Interview with author.

the federal budget process. Pam Dunn, who was FRESH's treasury secretary was also a government auditor and she loved looking through the budget. Dunn's background was helpful because she would review the budget and hold DOE to account. She recalled that at first, she would have to hound DOE for actual budget statements because she wanted to know what they budgeted versus what they actually spent. She was concerned that the DOE's practice of carrying over unspent funds would lead to budget reductions for environmental remediation. Eventually, at FRESH's insistence, the DOE became more open about the budget and included FRESH in budget priority setting. DOE also eventually gave Dunn and FRESH monthly cost performance reports. Dunn said that her accounting background and learning the federal budget process also increased her credibility and that of the organization with members of Congress.[297]

Several regulators and participants in Fernald's remediation also observed that FRESH was very adept at both flexing its political muscle (i.e. using its Congressional connections) to make sure DOE was doing its job and working with Congress to get more funds for remediation at Fernald to get the job done right. FRESH attended the Alliance of Nuclear Accountability's annual DC Days in which members of the network would meet with their members of Congress and present information about their sites. FRESH would have specific meetings with members of Congress about the environmental budget.

Lessons Learned from Making Fernald's Remediation More Participatory

In this concluding section, I discuss several lessons to be learned from the fight to make the decision-making process about Fernald's remediation more participatory. Above all, direct public involvement in decision-making is both meaningful and can lead

[297] Pam Dunn, Fernald Living History Project (2000), p. 6.

to better policy outcomes and solutions. Although agencies like the DOE argue that expertise is required to make decisions on highly technical issues, this study shows that individuals can educate themselves and develop expertise. I also argue that by opening up the decision-making process, trust in the DOE and legitimacy of decisions increased. Finally, even after the decision-making process was opened, FRESH continued to play an important role in educating the community and watchdogging the remediation.

Participation in decisions to remediate Fernald demonstrated that non-expert individuals can develop expertise and help achieve better outcomes. When Lisa Crawford, Pam Dunn and other core members of FRESH began, they were not technical experts. They did not know anything about radiation, the legal system or the regulatory process. However, because the issue touched them in a very personal way, they went about educating themselves and others. They also sought help from independent experts like Arjun Makhijani and the Institute for Energy and Environmental Research. Lisa Crawford recounted:

> "You learn quickly who you can trust and who you can't trust… We read documents until we were blue in the face. And we checked facts and we double checked facts.…The core group of FRESH, it's the officers and the board, on a lot of occasions had to read a lot of the stuff and then kind of water it down enough so the average person sitting in the audience at these meetings could kind of get it. And for some reason, we always found the resources or the material to enable us to be able to do that. But..it was a massive amount of work. You know, a lot of evenings spent on a computer. A lot of evenings spent with your nose in a book and many sleepless nights. And you know trying to hold down a full-time job and raise a family is…a lot you know. Quite a bit to ask of somebody but we felt that strongly about it. You know, that by God this wasn't going to happen any more."[298]

[298] Lisa Crawford, Fernald Living History Project (1999), p. 19.

Regulators noted that initially there was reluctance to include the community.[299] Some thought that the community would slow down the decision-making process. DOE especially didn't want people telling them what to do.[300] Lisa Crawford noted that "[DOE] didn't think we would educate ourselves. They would throw documents at us and we would read every one. Most of us were working a full time job and raising kids. They didn't think we read them. Never underestimate the power of a bunch of angry mothers."[301]

At the first public meetings, FRESH would hand out flyers. According to one FRESH member, "'Older people would come up and say 'Oh go home and put your apron on and raise your kids."[302] Lisa Crawford explained the feelings between DOE, contractors and the community this way, "They thought were just a bunch of dumb housewives. We realized how uneducated we were about what went on at the plant. They didn't think we were smart enough to pull it together. They didn't think we read everything, but we had to educate ourselves and understand. We had to learn to talk about nuclear issues, radiation, and limits. We did not know much about Superfund or all the acronyms. We carried notebooks and tablets and took notes. We would take them to meetings with DOE and we hold them to account."[303] In retrospect, regulators, DOE and the contractor realized that they didn't give citizen groups enough credit at first. FRESH and other members of the community educated themselves and came up to speed on the issues.

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[299] Interview with author.
[300] Interview with author.
[301] Interview with author.
[302] Pam Dunn, Quoted from "Roadmap to Resolution" (2014).
[303] Interview with author.

Many interviewees noted that one of the turning points in the process was the creation of the Fernald Citizens Task Force (which was renamed the Fernald Citizens Advisory Board in 1997 as its role in the remediation process changed). Members of FRESH commented that the Task Force was needed and helpful because they were overwhelmed, especially when it came to technical decisions about "how clean is clean," and because it brought in other people who had previously not been involved, including John Applegate, the much-respected chair and leader of the Task Force. According to FRESH members, the Task Force really helped to define the process of what to do with the site, how it would get cleaned up and how the public would participate in decisions.[304] Lisa Crawford said that "By the time the Task Force came along, we knew needed some help on technical issues. The Task Force helped us make some really tough decisions. And the DOE was very good about taking recommendations from the Task Force. If they tried to renege, we would have blasted them and they knew that."[305]

The DOE hired a consultant, Doug Sarno, as a technical consultant for the Task Force. Sarno's strategies to educate and involve the public were especially critical, according to several sources. The Task Force was very labor intensive and required a huge time commitment, especially in the beginning. Task Force meetings were held from the morning through lunch once a month from 1993 until 1996, and then met once every other month beginning in 1997. The Task Force met to learn technical topics, to learn about the operable units at the site, and to learn about contamination in order to produce consensus recommendations about the site's remediation. The majority of participants

[304] Interview with author.
[305] Interview with author.

believed that these intense workshops were necessary because of the varying levels of knowledge about technical issues and environmental public policy issues.

One of the first big hurdles in the remediation process at Fernald was the decision to determine "how clean is clean" and what to do with the site's radioactive and hazardous wastes. There was a fracturing within the Fernald community about the remedy they could live with. As the decision process began, FRESH, in addition to most of the community and state regulators, wanted all of the waste removed from the site. For example, Graham Mitchell of Ohio EPA recalled that at the beginning of the decision-making process, he, like the community, wanted all of the waste shipped off site. According to Mitchell, "I remember starting out thinking I want all this waste shipped out of here. I want every drop of it out. I want this site turned back to the way it was in 1949."[306] Pam Dunn also recounted that in the beginning FRESH's position was that site should be restored to background levels of radiation with no hazardous or radioactive waste left onsite.

The importance of educating and involving the community in the decision-making process was exemplified by how FRESH members changed their position about what to do with the site waste. According to Dunn:

> "That was probably one of the toughest decisions that came over there was the onsite disposal facility but nobody wants this stuff in their backyard. We call it NIMBY, "Not In My Back Yard". You can't be a NIMBY and some of this stuff does because of the proximity of people and the sole-source aquifer have to go off of this site. So we consciously went to what they called the balanced approach. You know we'll keep as much as we can here, some of its got to go. And I mean that was a big step I think. That's when FRESH, I mean we didn't have a consensus agreement as FRESH but I think that's when the majority of the members and the officers realized number 1 'there is not enough money to take it to background' and number 2 'it would have just been a moonscape to have taken it to background.' You would have just done total ecological destruction to the

[306] Quoted from Roadmap to Resolution (2014).

> whole place. And the shipment amounts would have just been phenomenal to even take it all off site."[307]

Several people interviewed noted that Doug Sarno's game, Cleanupopoly, although crude, helped them visualize the costs of different remedies. Lisa Crawford, Graham Mitchell and other members of the Task Force realized that removing all waste and taking it background levels of radiation just wasn't logically or realistically possible.

In addition, interviews highlighted that FRESH made an invaluable contribution to the decision-making process by reaching out to people across the country and relaying the perspectives from other communities who would be impacted by shipping radioactive waste offsite. FRESH traveled and met with other members of the Alliance for Nuclear Accountability and communities where Fernald's waste might be shipped. Lisa Crawford noted that "The Alliance for Nuclear Accountability really helped us because we were so insular. We were able to connect the dots across the country. The network helped us to communicate with people and share information."[308]

As Tom Schneider of Ohio EPA noted, FRESH played an important role in changing the community's perspective on what to do with the radioactive waste:

> "That FRESH was in tune with other sites had a huge role. Because FRESH was aware of what was going on at other sites and knew folks at other sites, it impacted decisions at Fernald. For example, they didn't want to ship our waste to other peoples' backyard…they didn't want to put our problem in someone else's backyard. It lent a different perspective to cleanup decisions. Without it, we wouldn't have gotten the same level of success we got with cleanup."[309]

Similarly, Jim Saric of U.S. EPA noted that because of FRESH's relationship with the Alliance for Nuclear Accountability, those involved in Fernald's remediation "understood that we aren't alone." FRESH relayed perspectives from other communities so that the

[307] Pam Dunn, Fernald Living History Project (2000), p. 7.
[308] Interview with author.
[309] Interview with author.

Fernald community came to understand that waste shipped offsite would impact other communities.

Understanding the cost of shipping waste offsite and the impacts it would have was a momentum changer in Fernald's remediation process. The Fernald community chose what was called "a balanced approach," that is to keep the higher volume, lower concentration radioactive waste and only ship the lower volume higher concentration waste offsite. By doing so, it saved hundreds of millions of dollars in remediation costs and it allowed the remediation process to move forward, according to U.S. EPA's Jim Saric.[310] Ultimately, about 80% of Fernald's waste remains on-site and 20% was shipped to disposal sites in Nevada and Utah.

One important indicator of the success of the Task Force and its decision was highlighted in The National Performance Review led by former Vice President Al Gore. The Fernald Task Force was highlighted in an October 1997 presidential progress report touting agencies and programs around the country that best exemplified the administration's reinvention of government at the national level. The report noted that more than $2 billion dollars were saved on the remediation because DOE partnered with the community. According to the report, "DOE set up a citizen advisory board at its Fernald facility to help with an environmental restoration project. Local citizens offered reasonable solutions that the community could live with and that helped save a bundle on the project too."[311]

[310] Interview with author.
[311] President Bill Clinton and Vice President Al Gore, "Putting Customers First '97: Standards for Serving the American People" (Washington DC: National Performance Review, October 1997), p. 8.

Once the community, regulators, DOE and contractors came together with a vision for the site, it really changed the trajectory of possible remediation outcomes. DOE could make the case to Congress for more funding and show that it had citizen and regulatory support for remediation work at the site. It had a snowball effect. As records of decision (ROD, the cleanup plans) were being made for site remediation, DOE site representatives could make the case at headquarters that they had citizen support for a vision for the site. They asked headquarters for more money upfront to make progress. According to regulators and contractors, in the long run, having the funds upfront actually helped save on remediation costs. In addition, because of the shared vision and agreement for moving forward, Fernald had an advantage over other sites competing for remediation funds across the nuclear complex.

FRESH and other members of the community, regulators, DOE and its contractor all agreed that building trust among the public was a key factor in Fernald's successful remediation. Lisa Crawford said that the success of Fernald's remediation was a trust issue and "In the early years, there was no trust in the [federal] government."[312] Although FRESH had a good working relationship with Ohio EPA from the beginning, it took years for trust to develop among the community, DOE and its contractors. Lisa Crawford said that FRESH and Ohio EPA agreed that they would work together to be on the same page about remediation and that they wouldn't do anything behind each other's backs that might undermine the other's positions.[313]

Graham Mitchell, a former regulator at Ohio EPA, noted that one way to build trust is to inform the public early in the process and not after a decision has been made.

[312] Interview with author.
[313] Interview with author.

Establishing trust among DOE, contractors, regulators and the public can also make future interactions and decisions easier. If you have built trust, according to Mitchell, "you can convince or talk or educate the regulators and the public, and their stakeholders into trying something a little different."[314] Several participants of the citizens Task Force noted in interviews that one of the best components of the workshops were the catered lunches because it allowed people – community members, contractors, DOE and regulators – who had been previously been fighting with each other to sit down and break bread with one another.[315] Fluor paid for the lunches, and according to several sources, the lunches made possible an important venue for building trust.

Several people noted in interviews that the relationships among people turned the situation around. From the DOE's perspective, Jack Craig commented:

> "I think when the public gets comfortable interacting with that specific individual I think that is something we [DOE] really value. And we like to not lose these types of people. I think the fact that this facility is near the city of Cincinnati makes it a little bit unique in the department, whereas a lot of these other DOE facilities may not be near central populated areas. You have Hanford, you have Idaho, Oak Ridge, I think that helps keep people in this area. The bottom line is people like living in Cincinnati and they're not interested moving to a remote location to do this type of work."[316]

Local DOE personnel noted that one of the greatest lessons from Fernald is that interaction with the public should be standard operating procedure at the agency and the agency should regularly let the public know what is going on at a site in a meaningful way that the public can understand. Doing so creates the possibility for better remediation and waste policy outcomes at sites. According to Jack Craig of DOE, "Interacting as a

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[314] Graham Mitchell, former Ohio Environmental Protection Agency regulator, Fernald Living History Project, September 9, 1999, p. 14.
[315] Interview with author.
[316] Jack Craig, Manager, DOE-Fernald, Ohio Field Office, Fernald Living History Project, March 9, 2001, p. 10.

team with the public, the regulators, the contractors has served a better clean-up. The Department couldn't go at it alone, the contractor can't go at it alone. These types of big public projects that are very visible have to have everybody involved and working together."[317] DOE and regulators also noted that owning up to problems can increase trust and prevent conflict with the public.

However, it is important to note that in some respects, Fernald was unique in the way in which it involved the community in decisions and it was far more successful in terms of public participation. In addition to the Citizens Task Force/Community Advisory Board, there were lots of public meetings (according to one regulator, there were 90 meetings in one year), community roundtables with information, local media coverage and formal feedback through regulatory mechanisms. Fluor Fernald also had an envoy program where staff members were responsible for communicating with members of the community and for making presentations. Tom Schneider of Ohio EPA noted that the success of public participation was unique in scale to Fernald compared to other defense nuclear sites both because the community demanded it and because DOE and Fluor were willing to invest in public outreach at Fernald.[318] Another observer noted that the success of public participation at Fernald was a result of the time period. DOE was more receptive to meaningful public engagement in the 1990s and there were other experiments with how to involve the public at other sites. But, according to some critics, there hasn't been a long-term management commitment to public engagement at all sites and it is difficult to effect wide-spread culture change in the agency.[319] Subsequent

[317] Jack Craig, Manager, DOE-Fernald, Ohio Field Office, Fernald Living History Project, March 9, 2001, p. 14.
[318] Interview with author.
[319] Interview with author.

chapters address the struggle to open up the regulatory process to public engagement at other DOE defense nuclear sites. While there is certainly variance across sites in terms of the degree to which DOE and its contractors are willing to engage communities, it is clear that citizen participation has made a difference across the nuclear weapons complex and processes are far more open now than they were during the Cold War.

It was also easier to involve the public in decisions about remediation at Fernald because the DOE ended production in 1989 and officially closed the site in 1991, thereby removing the intense need for secrecy at the site. As Lisa Crawford pointed out, "If a site still has a mission, it makes it that much harder. Production always takes precedent over cleanup. Shutting Fernald down was the biggest thing. Once the site actually turned from no production to cleanup and we got rid of the no fly zones and the secrecy piece of it, then life became a whole lot easier."[320] Graham Mitchell of Ohio EPA shared this perspective when he observed, "It is difficult to clean any site up when you have two missions - both production and cleanup."[321]

Conclusion

This chapter examined the role of FRESH in pressing for greater openness and public participation in decisions about the remediation at the Fernald nuclear site. FRESH's fight began in the mid-1980s when contamination was discovered in the wells of residents living near the site. However, it wasn't until the early 1990s that the Department of Energy finally began to openly share information and engage the community in the decision-making process. DOE was willing to do so only after FRESH members, the state of Ohio and workers filed lawsuits that cost the agency hundreds of millions in litigation

[320] Interview with author.
[321] Graham Mitchell, Oral History Interview, p. 19.

and settlement fees. The end of the Cold War and a new administration with an agenda for openness at DOE, scrutiny by Congress and the media also pressured the agency to open up decision-making to public participation.

Greater openness and public engagement did pay off in terms of increased trust and greater legitimacy of decisions, though it wasn't easy or cheap. Through one formal mechanism, the Citizen's Task Force, public participation produced a balanced approach to remediation that took into account the concerns of the Fernald community and other communities across the country that would be recipients of waste or through which waste would travel. Recommendations made by the Task Force saved $2 billion in costs based on previous remediation costs estimates, and DOE, U.S. EPA and Ohio EPA also unanimously accepted Task Force recommendations. FRESH members were key participants on the Task Force, and played an important role in influencing the decision about what to do with the site's waste. FRESH also educated the community about technical issues and key Task Force decisions.

FRESH's fight for greater openness and public engagement in decision-making demonstrated that dedicated and concerned individuals could come together to leverage major change in the policies and attitudes of a bureaucracy that was historically resistant to change. Despite the fact that remediation and waste management at nuclear sites are technically complex, FRESH demonstrated that sustained involvement and education can contribute to successful participation and policy outcomes. FRESH also demonstrated the important role that grassroots community groups play in influencing key decision-makers and helping others understand complex issues in order to arrive at decisions that are communally beneficial. The case of Fernald does have unique qualities, especially the

degree to which DOE and its contractor, Fluor Fernald, were willing to engage the public throughout the remediation process. However, the level of citizen activism of the sort seen at Fernald has made a difference at other sites as well. The next chapter examines citizen participation at the nation's nuclear weapons laboratories, both operating sites in two different states whose remediations are governed by different regulatory structures.

Chapter Five: Breaking DAD: Grassroots Efforts to Involve the Public at Sites with Ongoing National Security Missions

Whereas chapter four examined the efforts of citizen groups at a nuclear weapons facility that was closed to production in 1989, this chapter examines efforts at facilities where there are ongoing national security missions, and at the only national repository for nuclear weapons waste. As was the case with Fernald discussed in chapter four, concerned citizens affected by nuclear weapons facilities mobilized in the mid-1980s to address health, safety and environmental pollution at the sites discussed in this chapter. This chapter seeks to demonstrate how citizen efforts have pressed the government to reconcile disparate responsibilities for national security and the welfare of its citizens, including health, safety and environmental protection. I find that even at sites with ongoing national security missions, grassroots community organizations have played a vital role in holding the Department of Energy (DOE) accountable for the health and environmental legacy of nuclear weapons, in educating the public and in opening decision-making processes to citizen participation. However, whereas sites closed to production better incorporated the announce-discuss-decide model of public participation that incorporates the public early and often in decisions, it has been a much greater challenge to break the decide-announce-defend (DAD) model at sites with ongoing national security missions.

This chapter examines the work of grassroots community organizations in New Mexico, which is home to the Los Alamos National Laboratory (LANL) and the Waste Isolation Pilot Plant (WIPP), and in California, home to the Lawrence Livermore National Laboratory (LLNL). Specifically, I examine the efforts of the Southwest Research and Information Center (SRIC), Nuclear Watch New Mexico (Nuke Watch)

and Tri-Valley Communities Against a Radioactive Environment (Tri-Valley CAREs), all of which have been leaders for change at sites in their communities and for change in national policy. By exploring efforts around these sites, I show the interconnectedness of the sites and the communities they impact. While each of these sites has ongoing missions and is operational, environmental remediation and waste management at the sites are addressed under different regulatory structures.[322] LLNL, for example, is a Superfund site, and environmental remediation efforts are addressed under a Federal Facility Agreement signed by DOE, US Environmental Protection Agency, California Department of Toxic Substances Control (DTSC) and San Francisco Bay Regional Water Quality Control Board (RWQCB). LANL is not an EPA Superfund site and environmental pollution is addressed under a Consent Order between DOE and the state of New Mexico. While EPA technically has regulatory authority in WIPP's operation, it has authorized the state of New Mexico as regulator and groups noted that the EPA does very little actual regulation of the site. Thus, there are key differences in the way that public participation is structured among the sites. The language regarding public participation is relatively quite strong under Superfund and community acceptance is among the nine criteria by which DOE is required to evaluate a "cleanup" remedy. Although not perfect, grassroots community organizations in California expressed greater satisfaction with their ability to use the Superfund process to participate in environmental decisions compared to groups in New Mexico, where there are greater ongoing struggles for access to information and participation in decision-making. Efforts in these two states

[322] Technically, operations at WIPP were halted following two isolated incidents in February 2014 - the discovery of a radiation leak and a fire on a salt hauling truck. However, DOE plans to reopen the site, and perhaps even expand the site's mission, after updates to safety plans, procedures and mechanisms are complete.

also provide an interesting contrast as the nuclear weapons industry plays a more significant role overall in New Mexico's economy with the labs ranking among the top ten employers in the relatively poor state.[323] Addressing environmental contamination is therefore a greater challenge in New Mexico since the problems emanate from one of the state's top employers. Furthermore, although imperfect at enforcement, regulatory agencies in the state of California have been more willing to assert regulatory authority over health and environmental pollution problems. Thus, this chapter seeks to demonstrate the importance of citizen involvement even under varying conditions, including ongoing national security missions and differing regulatory frameworks.

LLNL: Creating Opportunities for Public Involvement Where None Existed

Livermore, California is home to one of two classified national laboratories that have designed the physics package of every warhead in the U.S. nuclear arsenal (Sandia, the third nuclear weapons laboratory, designs the non-nuclear components that make nuclear weapons deliverable). As at other sites in the nuclear weapons complex, the Department of Energy's historical secrecy about nuclear weapons activities shielded environmental and other policy issues at Lawrence Livermore National Laboratory (LLNL) from democratic debate and prevented surrounding communities from participating in decisions. To address this political void, Marylia Kelley and a few neighbors formed Tri-Valley Communities Against a Radioactive Environment (Tri-Valley CAREs) to "educate ourselves and the community" and hold DOE accountable for the severe toxic and radioactive pollution stemming from LLNL's nuclear weapons activities. As Tri-Valley CAREs sought more information and raised awareness about the

[323] Stacy Sacco, "Largest Employers in New Mexico," May 1, 2014, http://nmnetlinks.com/cms/kunde/rts/nmnetlinkscom/docs/239337970-05-20-2014-20-10-46/xls_upload.htm.

site, it empowered the community to raise questions about the site's operations and impact.

Tri-Valley CAREs has grown from a handful of neighbors in 1983 to more than five thousand active members from across the community today. By framing the issues as a "public right" to know and participate in decisions that affect the health, safety and environment of the community and workers, the organization has been able to attract membership from people with differing viewpoints including current lab employees, former nuclear weapons physicists and families of radiation-exposed employees, as well as environmental and peace activists. As a result of Tri-Valley CAREs efforts, there are now public involvement opportunities at LLNL where previously none had existed. In addition, Tri-Valley CAREs has also pushed the state of California to use and enforce its regulatory authority. Environmental remediation efforts under the Comprehensive Environmental Response, Compensation and Liability Act (CERCA, a.k.a., Superfund) at LLNL have also improved as a result of the organization's efforts to educate and involve the public. Tri-Valley CAREs was the first organization in the western U.S. to receive an EPA grant to monitor the Superfund cleanup at LLNL and the first community based group in the whole country to win an award from U.S. EPA for its effectiveness. In recognizing Marylia Kelley and Tri-Valley CAREs, U.S. EPA observed:

> Executive Director Marylia Kelley has educated herself on all aspects of Superfund and the National Contingency Plan, and has mastered the formidable technical knowledge required to understand cleanups. Her comments to both EPA and the Department of Energy are useful and well-reasoned. She has developed community acceptance criteria that she has circulated for use by the whole community.[324]

[324] U.S. Environmental Protection Agency, "EPA Honors 17 Northern California Environmental Heroes," Press Release, April 18, 2000.

Tri-Valley CAREs has also had legislative successes, including securing funding for remediation and advocating legislation to compensate workers made ill on-the-job.

LLNL, located about 45 miles east of San Francisco, was first used as a Naval Air Station in the 1940s. In 1951, it was transferred to the U.S. Atomic Energy Commission and was established as a nuclear weapons and magnetic fusion energy research facility. LLNL is an operating facility with an ongoing national security mission. More than 80% of lab's annual budget remains devoted to nuclear weapons activities. There are approximately 50,000 people living within a two-mile radius and groundwater about two miles west of the site in downtown Livermore is used as a municipal drinking water source. DOE considers the impact area to include more than seven million people within a 50-mile radius of the main Livermore site. Since 1952, weapons activities at LLNL have contaminated the land, water and air, including the release of approximately one million curies of radiation into the environment.[325]

LLNL is on the U.S. EPA's "Superfund" list of most heavily contaminated sites in the country. Remediation of soil and groundwater is expected to take 50 to 80 years or longer. Groundwater on- and off-site has been contaminated with volatile organic compounds (VOCs) and chromium.[326] In addition, groundwater on-site has been contaminated with fuel hydrocarbons including benzene and ethylene dibromide, the heavy metal lead, and tritium. Rainfall at the lab has been found to contain tritium concentrations seven times higher than the state and federal maximum standards for

[325] Patrice Sutton, Jacqueline Cabasso, Tracy Barreau and Marylia Kelley, "A Collaborative Effort to Address the Distribution of Plutonium Contaminated Sludge in Livermore, California," February 28, 2007, see especially Table 1 on p. 7, "Timeline of Plutonium Sludge and Some of the Known Unintentional Releases of Radioactive Material from Lawrence Livermore National Laboratory, http://www.trivalleycares.org/pu_sludge_case_study.pdf.
[326] U.S. Environmental Protection Agency, Lawrence Livermore National Laboratory Main Site, Site Overview, http://yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/ViewByEPAID/CA2890012584.

drinking water. A 1995 California Department of Health Services investigation found that children and young adults in Livermore have six times the normal incidence of malignant melanoma and elevated levels of cancers.[327]

About 18,000 cubic yards of soil excavated from the site was contaminated with solvents, radioactive wastes, heavy metals, polychlorinated biphenyls (PCBs), and fuel hydrocarbons. Soils remaining on site contain VOCs, tritium, PCBs, fuel hydrocarbons, and inorganic substances. Initial actions to remediate the site included the excavation and removal of 4,000 cubic yards of contaminated soil from several waste disposal pits to certified off-site disposal sites and closure of an inactive landfill, with subsequent removal of approximately 14,000 cubic yards of contaminated soil. LLNL also provided alternative water supplies to residents with wells affected by contamination. Ongoing remediation efforts include treatment plants for groundwater pumping and treatment and for soil vapor extraction (SVE).

LLNL's Site 300, another separate and distinct Superfund site located 15 miles east of the lab, was developed in the 1950s as a research facility. DOE primarily uses the site as a high explosives and materials testing range in support of nuclear weapons research. Groundwater and soil at the site have been contaminated with solvents and other VOCs, tritium, uranium-238, high explosive compounds, nitrate, and perchlorate.[328] Contaminated groundwater is the primary health threat from the site. Site 300 also poses

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[327] Agency for Toxic Substances and Disease Registry, Public Health Assessments and Consultations, Lawrence Livermore National Laboratory Main Site (USDOE), http://www.atsdr.cdc.gov/HAC/pha/PHA.asp?docid=48&pg=2.

[328] U.S. Environmental Protection Agency, Lawrence Livermore National Laboratory Site 300, Site Overview, http://yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/db29676ab46e8081882574260074373 4/d83824759d4ae31d88257007005e9408!OpenDocument.

ecological risks as much of the site is endangered species habitat. Remediation efforts began at Site 300 in 1991.

Community members were mobilized to action in 1983 when high concentrations of contaminants from LLNL were discovered in the drinking wells of nearby residents. Community members concerned about the site joined together to found Tri-Valley CAREs. At the time of the organization's founding, the communities surrounding LLNL were so effectively kept in the dark about lab activities that there was no public understanding that toxic and radioactive contaminants were in fact escaping into their air, soil, surface streams and groundwater aquifers. Marylia Kelley, one of the organization's co-founders, moved near LLNL while studying journalism at the University of California at Berkeley. She was working at a Livermore newspaper for several months before realizing that the Lab designed nuclear weapons. She said it took longer still to discover that those weapons programs utilized large quantities of radioactive and chemically hazardous substances. According to Kelley, "No one talked about Livermore Lab publically, and reporting was mostly limited to stories peripheral to the Lab's mission and impact. Where there should have been information and lively debate, there was silence. The veil of secrecy was very thick, especially about environmental and health issues."[329]

With formal training as a journalist, Kelley set about to use her knowledge of the California Public Records Act (CPRA) and the Freedom of Information Act to find out which agencies were involved in LLNL and to get more information about contamination on the site. Following the 1984 *Leaf v. Hodel* ruling that DOE had to comply with state hazardous waste laws (discussed in chapters two and three of this dissertation), Kelley filed a CPRA request, which required the state to conduct its first inspection of LLNL.

[329] Interview with author.

The state's inspection report revealed that there were drums of hazardous and radioactive waste leaking on the site and drums of incompatible waste stored together. Kelley filed a second CPRA request and took pictures of the state's pictures of contamination and wrote up the state's findings to educate the community. She also requested a public hearing, arguing that the lab needed a permit from the state of California for hazardous waste. It turned into a many years-long struggle. Tri-Valley CAREs litigated under the California Environmental Quality Act to ensure there were stricter enforcement mechanisms in the RCRA permit for state agencies.[330] LLNL didn't receive an operating permit from the California Department of Toxic Substances (DTSC) to process and store hazardous waste until 1999.

After the revelation of the contaminated wells, Tri-Valley CAREs also began meeting with state regulatory agencies to push them to use their regulatory authority to the utmost. The revelations of contaminated groundwater prompted the California Department of Health Services (CDHS) to issue a "Determination of Imminent or Substantial Endangerment" in 1984, compelling the lab to close wells at neighbors' homes along the western perimeter and provide residents with bottled water. That same year, LLNL was nominated to be on the EPA's Superfund list. However, it took another three years before LLNL became a Superfund site and required an agreement, brokered by the Department of Justice, that made DOE the lead agency on cleanup rather than EPA. In 1987, the same year that LLNL was added to the EPA's list of Superfund sites, the California Regional Water Quality Control Board (CRWQCB) issued an order directing LLNL to investigate and clean up the on- and off-site contamination.

[330] Scott Yundt, Talking Points on the Hazardous Waste Permit, Community Meeting, September 18, 2014, on file with author.

Marylia Kelley and Tri-Valley CAREs pioneered a process of directly involving community members in decision-making processes at the site, and in doing so changed the relationship between LLNL and its neighbors.[331] Like the other efforts examined in this dissertation, one of the core beliefs of Tri-Valley CAREs is that "ordinary" people have the ability to develop expertise on issues that affect their lives. This differs from the traditional perspective that affected citizens depend on outside "experts" to make change when dealing with complex issues such as nuclear weapons and environmental health. Instead of centering efforts "inside the beltway" as other organizations concerned with environmental issues have done, Tri-Valley CAREs believed that educating and mobilizing the community that hosts LLNL could have more of an impact on decision-making processes and could serve as countervailing force to the influence of contractors. As a result, Tri-Valley CAREs has developed a diverse pool of "resident experts" on nuclear weapons and Superfund cleanup issues and helped them increase their skills in public speaking, political advocacy, reviewing environmental documents, neighborhood organizing and writing effective opinions for the media.

These community-based experts are enabled to collaborate effectively with local, state and federal agencies as informed participants and co-decision-makers. Tri-Valley CAREs also provides opportunities for community members to tell their stories directly to elected officials by bringing a team to Washington annually. The organization offers advocacy training for community members before "DC Days" and in advance of district meetings with members of Congress. These meetings have resulted in congressional

[331] As a result of the impact of her work, Marylia Kelley has won awards from the Alameda County Health Department and U.S. EPA, among others.

commitments, including stable or increased funding for environmental remediation at LLNL sites.

At LLNL, Tri-Valley CAREs also pioneered unique public involvement opportunities outside of legally-mandated opportunities. Specifically, Tri-Valley CAREs initiated and instituted technical meetings onsite with regulators, DOE and contractors and community tours of the LLNL sites, both of which are particularly difficult at classified sites like LLNL. Tri-Valley CAREs organizes special tours once or twice per year with LLNL management of Superfund cleanup sites inside the nuclear weapons laboratory and Site 300 for area residents. These are not public relations tours and Tri-Valley CAREs noted that it appreciates the level of effort it takes the lab to do these tours. Eight to ten top-level management and technical staff join the tour to brief residents and answer questions on issues as they go from site to site. This is a unique education opportunity for the public to really understand what the issues are. Marylia Kelley observed:

> "There is no substitute for looking directly at what has happened. For example, when we go out to Site 300, we can see the Elk Ravine fault and where they pushed gravel off of a firing table into the ravine. You can better visualize the transport of contaminants and see what the challenges are in terms of pervasive uranium contamination in the soil. And you can see the granite outcropping and uplift from earthquakes. There is also the Pit 7 Complex. When you hear the word 'pit,' you imagine it as a small thing, but when you see them, they are expansive. You really have to be there to realize how huge they are and how much land they cover. The pits are unlined dumpsites and they were dug in low-lying flat areas, so in wet years when the ground water rises, it mixes with the contamination and that's why there is a two-mile plume of uranium, tritium and other contaminants."[332]

Kelley asserted that members of the public are not as ready to comment on a feasible cleanup remedy if they've only read about it. It's much easier for the public to make

[332] Interview with author.

informed comments and understand what they are commenting on when they've seen the sites for themselves. According to Kelley, "There is no substitute for bringing community members to the sites and letting them ask directly how DOE and contractors are going to approach those problems. To increase the public's education level is to bring them to see the sites and to see cleanup."[333]

Another method of public involvement that Tri-Valley CAREs pioneered are regular technical meetings on the LLNL Superfund "cleanup" effort, which brings together members of Tri-Valley CAREs, the community's technical advisor, U.S. EPA, state Department of Toxics, Regional Water Quality Control Board, Livermore Lab and the Department of Energy. The technical meetings, though not part of any formal regulatory or legal requirement, have allowed the public to gain information about contamination, health and safety issues and about efforts to address them. The day-long meetings are held every three to four months at LLNL. Marylia Kelley prepares the agenda, secures participation and Tri-Valley CAREs controls the meeting. LLNL management and cleanup staff make presentations based on items Kelley has requested in the agenda. The meetings allow for a round-table discussion and allow for community input on issues and they also allow the community to get the perspective of different agencies. EPA, DTSC and the Water Board have adopted comments that Tri-Valley CAREs has made in these meetings as part of Superfund documents and agreements with the lab. Though they don't always agree, even DOE has adopted recommendations the organization has made on issues at these meetings. One example to this effect is that the lab withdrew a plan that Tri-Valley CAREs opposed to "pump and dump" more than 80 million gallons of untreated and contaminated groundwater from an offsite contamination

[333] Interview with author.

plume into the sewer system because the contaminants would ultimately end up in the San Francisco Bay.[334] Instead the LLNL will pump the toxic water back to the main site for treatment. After the technical meetings, to more broadly disseminate the information exchanged, Tri-Valley CAREs makes presentations at organizational meetings, posts information on their website and develops fact sheets to take door-to-door in the neighborhoods surrounding the site.

In addition to the these non-legally required mechanisms, Tri-Valley CAREs has also organized participation by hundreds of residents in formal public meetings with U.S. EPA, state regulatory agencies and LLNL officials. Mobilizing the community has had impact. For example, in 2010, broad community participation in meetings persuaded LLNL to improve its cleanup plan. Tri-Valley CAREs has also mobilized the community to attend and make comments for legally mandated public hearings under Superfund, National Environmental Policy Act or the Resource Conservation and Recovery Act.

Tri-Valley CAREs noted that Superfund in particular has been a useful tool for ensuring public concerns are incorporated into environmental remediation decisions. At LLNL sites, the remediation strategy must satisfy a number of criteria to be accepted by U.S. EPA, and among the criteria is "Community Acceptance." Tri-Valley CAREs worked with communities to craft a consensus definition of community acceptance for remedies at LLNL, and other sites, and gauge remedial action plans and Records of Decision against the community criteria. Previously the definition had been undefined and was therefore unenforceable, allowing LLNL (and other government sites) to circumvent the Superfund cleanup process.

[334] Interviews with author.

Tri-Valley CAREs also played an important role in the initial advocacy for legislation to aid atomic workers at Livermore Lab and other nuclear weapons sites made ill by on-the-job exposures. Since the Energy Employees Occupational Illness Compensation Act passed in 2000, Tri-Valley CAREs has increased workers' access to the compensation promised in the legislation. Tri-Valley CAREs garnered support from Senator Dianne Feinstein and Representative Ellen Tauscher for a California Resource Center to inform workers about their rights. In addition, Tri-Valley CAREs established and facilitates a support group for some 1,900 former lab employees who have filed for compensation because of job-related illnesses. According to Tri-Valley CAREs staff attorney Scott Yundt, "Half of them have been refused, and it's been a powerful learning process for me. We hear about above-the-ground accidents, but every worker has stories of spilling radioactive materials, and many of them get ill."[335]

The work of Tri-Valley CAREs to involve the public in decision-making continues to produce significant results. For example, recent petition drives by the organization garnered tens of thousands of personal notes and signatures to remove plutonium stockpiles from LLNL and to increase funding for cleanup at the lab. Tri-Valley CAREs has also served as a model for other communities around nuclear weapons sites. Marylia Kelley and others at Tri-Valley CAREs often share expertise with other communities facing similar issues, especially how to create novel public involvement opportunities where none exist and how to use open government laws, the like the Freedom of Information Act, to obtain information from state and federal agencies. Kelley and others at Tri-Valley CAREs also share their expertise on how to engage

[335] Lou Fancher, "Thirty citations issued at annual Livermore lab 'Failure to Disarm' protest," Contra Costa Times, August 6, 2014, http://www.contracostatimes.com/contra-costa-times/ci_26290879/thirty-citations-issued-at-annual-livermore-lab-failure.

decision-makers, advocate for stringent cleanup standards and organize their communities.

Even though Tri-Valley CAREs has had a number of successes, it also continues to confront the culture of secrecy at DOE. As a recent example, the organization noted that LLNL started and then abandoned a study of potential solutions to a technology that has complicated cleanup by commingling radioactive and hazardous pollutants in groundwater.[336] The lab never circulated the study to the public and it has no deadlines to seek public involvement or make technical decisions to address the problem. The organization also expressed concern over recent discoveries that there is more wide-spread contamination of depleted uranium than previously known at Site 300, and over the discovery of radioactive tritium in the groundwater at the Main Site. There is a possibility that an excessive level of pollution could be chosen by the lab as a "cleanup" level without public involvement.

The efforts of Tri-Valley CAREs to educate and involve the public further demonstrates that citizens can develop expertise on highly scientific and technologically complex issues and that their efforts can make a difference even at a classified nuclear weapons facility. Without the work of Tri-Valley CAREs to watchdog the lab and inform the public, there would be far less knowledge of the nature and extent of environmental pollution and threats to public and worker health. In addition, without ongoing watchdogging efforts, DOE would be far less accountable in addressing these issues. As Marylia Kelley observed, "Public education and involvement really has been the best and sometimes only method for leveraging change in Livermore Lab operations. Things have

[336] Tri-Valley CAREs, Citizens' Watch, Fall 2015, http://www.trivalleycares.org/new/Fall2015CW&Insert.pdf.

gotten better. There have been fewer accidents and we have a better cleanup because of changed leverage by Tri-Valley CAREs mobilizing the public and getting the public to the table, even if we had to build the table. It has made a difference in the quality of cleanup, in the amount of cleanup, in determining how clean is clean and in determining how hazardous waste is handled."[337]

Struggling for Greater Involvement at LANL

Located 25 miles from Santa Fe, New Mexico, Los Alamos National Laboratory (LANL) was established in 1943 as the Y site of the Manhattan Project for the single purpose of designing and building an atomic bomb. During the Manhattan Project and throughout the Cold War, as with other nuclear weapons facilities, little thought was given to waste disposal or environmental contamination; the goal was to develop nuclear weapons and win the war. While the national security mission of LANL continues today, the lab acknowledges that national security "is now inseparable from protecting the environment."[338]

LANL is a 36-square-mile site that continues to research and develop nuclear weapons. It is a high-profile and complicated facility that impacts several communities including San Ildefonso Pueblo, Santa Clara Pueblo, the city of Espanola and city of Santa Fe (with a population of approximately 147,000 people as of 2013). The Department of Energy (DOE) and New Mexico's Environment Department (NMED), through authority delegated by U.S. EPA under the Resource Conservation and Recovery Act (RCRA), oversee environmental remediation at the site. The site is not on the U.S. EPA's list of Superfund sites and therefore remediation efforts are not addressed under

[337] Interview with author.
[338] Los Alamos National Laboratory website, http://www.lanl.gov/projects/envplan/clean/contaminants/index.php?page=ashleypond.

the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). Former New Mexico Senator Pete Domenici and lab officials led successful efforts to keep the lab from being scored as a Superfund site when other nuclear weapons facilities were being evaluated by arguing that the primary purpose of the facility is research and development, not production.[339] Critics assert that if the site was evaluated today, it might well meet the criteria for inclusion because of groundwater contamination.[340] Furthermore, critics contend that as a result of keeping LANL off of Superfund, the site has been the recipient of more "dirty work." They also point out that LANL is a manufacturing facility and has produced new plutonium pits (the fissile plutonium cores of nuclear weapons).

As a result of nuclear weapons research and development activities, LANL contains more than 21 million cubic feet of toxic waste that has been buried at the site since 1943. Some 2,100 sites were originally identified for remediation under the 2005 Consent Order (CO) between DOE and the State of New Mexico, including 26 Material Disposal Sites consisting of unlined pits, shafts, and trenches. Hazardous chemicals, mainly tritium, chromium, and high explosives have been found in surface waters and aquifers beneath LANL. As a result of groundwater contamination, surface water runoff and erosion threaten the environment off-site and are a threat to the health of surrounding communities. According to Scott Kovac at Nuclear Watch New Mexico, "Fortunately the aquifer is deep and we have a little time, but DOE is squandering time and advantages.

[339] Interviews with author.
[340] Interviews with author. See also: Suzy T. Kane, "Bombs Away!," *Horse Fly*, April 15, 2008, p. 8.

Every time it rains, I think a little more is getting washed to the Rio Grande. I ask myself 'What did they clean up today?' and the answer is probably not very much."[341]

Remediation efforts began in 1989 and remediation of about half of the sites has been completed, though it's the more technically complex projects that await completion. Initial investigations of about 90 percent of the remaining sites have also been completed and many cleanup alternatives have been investigated for remaining sites. A groundwater monitoring well infrastructure was installed, with more monitoring wells planned for installation. As late as 1996 the Lab was insisting that groundwater contamination was impossible because the overlying volcanic tuff was "impermeable." This was despite the fact that the Parajito Plateau lies between a seismic rift (the Rio Grande Valley) and a dormant supervolcano (the Jemez Mountains), and is highly fractured. The Lab went so far as to formally ask the New Mexico Environment Department for a waiver from having to do any groundwater monitoring at all. However, the CO stipulated that remediation of all major cleanup operations at LANL must be completed by December 2015. Because of new priority deadlines set by a 2012 Framework Agreement to step up shipment of Transuranic (TRU) wastes to the Waste Isolation Pilot Plant (WIPP), the 2015 deadline will be extended or renegotiated, a process that is beginning as of this writing.

There are three major remediation efforts currently underway at LANL. One is the Upper Los Alamos Canyon project, which involves evaluating 115 sites for residual contamination liquid wastes that were disposed of in canyons surrounding the site. The project involves soil and rock sampling, groundwater monitoring and gathering data for future remedial activities. In addition, some 10,600 cubic meters of TRU wastes were

[341] Interview with author.

stored and buried at LANL. TRU waste consists of clothing, tools, rags, residues, debris, soil and other items contaminated with small amounts of plutonium and other man-made radioactive elements from nuclear production and research activities.

Following a large forest fire in 2011 that reached within three and a half miles of waste storage sites containing thousands of drums of contaminated waste, the DOE and state of New Mexico negotiated a non-binding Framework Agreement to step up shipments of TRU wastes from LANL to the WIPP facility.[342] The Framework Agreement set a deadline of June 2014 to ship some 3,706 cubic meters of TRU wastes, and a deadline of December 2014 for the removal of all newly generated TRU waste. However, that effort has been delayed because a waste drum from LANL packaged with reactive materials caused radioactive releases in February 2014 and halted operations at the WIPP facility (discussed in detail later in the chapter). In addition, because the Framework Agreement was prioritized, it meant that other remediation efforts under the 2005 Consent Order were postponed.[343] Nuke Watch has repeatedly criticized the Framework Agreement for not being necessary (if the TRU wastes were going to burn they would have done so in a forest fire in 2000 that came within a half-mile of the wastes), and for condoning little if any actual cleanup. In any event, the Framework Agreement ended in disaster with the closure of WIPP, while before that NMED had granted more than 100 requested time extensions to Consent Order milestones.

The third major remediation effort involves Technical Area 54 (TA-54), which has over 100 contaminated sites (many old waste storage sites) that are undergoing decontamination and decommissioning. This work includes remediation and removal of

[342] "Los Alamos fire inches closer to nuclear waste," Associated Press, June 28, 2011, http://www.cbsnews.com/news/los-alamos-fire-inches-closer-to-nuclear-waste/.
[343] John Kieling, New Mexico Environment Department, Interview with author.

domes, pads, buildings, and foundations that are contaminated with radioactive wastes. As one of the more complex areas for remediation, it will be one of the final projects to reach completion.

As is the case of other organizations studied in this dissertation, initial revelations about environmental pollution and threats to health and safety at LANL led to public awareness and mobilization efforts. Grassroots community groups, especially Nuclear Watch New Mexico (Nuke Watch), Concerned Citizens for Nuclear Safety (CCNS) and Southwest Research and Information Center (SRIC) have engaged in efforts to educate and mobilize the public and to push the state environment department to exercise its regulatory authority.[344] In spite of ongoing national security missions at the LANL, the groups have had some successes in using environmental laws to hold DOE accountable for environmental, health and safety concerns, and in pressing for greater public involvement opportunities. Some of the groups noted that they have been most successful when they are in agreement on issues with the state of New Mexico.

Similar to the mobilization of other communities across the country, many individuals who have become involved and organized around nuclear issues in New Mexico did not begin with expertise in environmental remediation, waste or nuclear issues. However, over time they have developed expertise. Scott Kovac, who now serves Nuke Watch's Operations and Research Director and the primary staff member working on remediation and waste management issues, began as a volunteer at the organization addressing newsletters. Kovac had previously known Nuke Watch's executive director, Jay Coghlan, in the construction business where he worked as an electrical contractor for

[344] Because there is some division of labor between the groups in New Mexico, this section will focus on Nuke Watch and CCNS, while the section on WIPP will focus on SRIC, though the groups do all work together on both sites.

30 years. Kovac had not been very politically active while working in the construction business. He said he was aware of some issues, but was not a concerned environmentalist before joining Nuke Watch. Kovac has a BA in electrical engineering, so he does have some math background, but prior to joining Nuke Watch, he was not a nuclear expert. As Scott Kovac put it, "What they don't realize is that we are experts when we are citizens of our towns and we can learn the rest after that."[345] Today, Coghlan and Kovac are frequently called upon by the media to comment on issues and to provide independent assessments. In addition, they regularly (and doggedly) provide informed questions and comments, and raise issues to NMED and to DOE.

Jay Coghlan, a self-described "mountain hippie" who served as program director at CCNS and co-founded Nuke Watch, came to be involved in nuclear issues in 1989 when LANL issued a proposal to resume mixed hazardous and radioactive waste incineration, which concerned citizens argued required permitting by NMED. Prior to that, he was in the construction business. Coghlan organized a letter-writing campaign against the radioactive incineration that was aimed at New Mexico's two Senators, and Bill Richardson, who was then the Congressman representing the third district. Ultimately, Richardson successfully passed an amendment to the 1989 Defense Authorization Bill that imposed a moratorium on nuclear incinerator operations in New Mexico until NMED could promulgate air quality regulations on mixed waste incineration.[346] Under public pressure, NMED sought to impose operating conditions that when radioactive air emissions from the incinerator exceeded 10% above background,

[345] Interview with author.
[346] Susan Martin, "Memorandum on Congressional Debate and Vote in the DOD Authorization Bill," Environmental Improvement Division, August 17, 1989, https://hwbdocuments.env.nm.gov/Los%20Alamos%20National%20Labs/TA%2050/8599.pdf.

then operations would be halted. Both DOE and its LANL contractor, the University of California, sued NMED arguing that the state didn't have the authority to regulate radionuclides. The state argued that New Mexico had the authority to impose the operating condition to protect public environmental safety and health because it's mixed waste under RCRA (meaning both radioactive and hazardous). The state's position won in federal court and then won again after DOE appealed to the State Supreme Court. The case marked the first time LANL had been forced to back down on a major issue and it set an important legal precedent for enhanced state authority in regulating environmental matters at the site. In the face of public controversy, LANL abandoned its attempt to resume mixed waste radioactive incineration and the incinerator was never again made opertional.[347]

Grassroots community groups in New Mexico have also resorted to litigation with some key successes. One of the first and historic citizen suits was filed by CCNS in 1992 against LANL for Clean Air Act violations. According to Coghlan, who was Program Director at CCNS during the suit, the organization procured testimony from whistleblowers documenting the lab's intentional violations of the Clean Air Act's radioactive air emissions requirements.[348] Five years later, a federal judge ruled that LANL was in violation at 30 of its 33 major radioactive air emissions sources. After prolonged settlement negotiations, a settlement between DOE and CCNS required DOE to implement the first-ever independent, non-governmental audits of its air emissions

[347] Concerned Citizens for Nuclear Safety fact sheet "Radioactive and Hazardous Wastes to be Burned in Los Alamos Incinerators" July 1989.
[348] Jay Coghlan, "Weapons Lab Settles Landmark Citizens Clean Air Act; Lawsuit On Radioactive Air Emissions," CCNS, http://www.nuclearactive.org/docs/cleanairact.html.

monitoring program.[349] The settlement also required DOE to continue a popular online emissions monitoring program and to fund $450,000 to the University of New Mexico Masters in Public Health Program to establish a curriculum in environmental health issues related to the Clean Air Act.

The network of New Mexico groups has also worked together to use environmental laws, especially the National Environmental Policy Act, to gain information and to address the environmental impacts of the lab. For example, in 1997, several of the organizations in New Mexico began pressing LANL to produce a new Site Wide Environmental Impact Statement (SWEIS), which NEPA requires the lab to produce every ten years, but LANL had only produced one in 1979. In unrelated documents obtained under the Freedom of Information Act, Jay Coghlan had found that the Lab had admitted internally that the old SWEIS was obsolete and could no longer be used as a foundation for project-specific NEPA processes at the Lab.[350] Shortly thereafter, LANL and DOE agreed to prepare a 1999 SWEIS for continued operations. The 1999 SWEIS revealed valuable information to the public about LANL, including environmental and safety concerns. In a formal comment to the draft SWEIS, Jay Coghlan argued that the SWEIS had omitted that wildfire was a real threat to the lab. DOE agreed and subsequently included a detailed analysis in the final 1999 LANL SWEIS regarding what would happen if a wildfire broke out. In 2000, a real wildfire broke out. According to LANL officials, they followed the SWEIS model to predict what

[349] "Consent Decree Between CCNS and DOE," *Concerned Citizens for Nuclear Safety v. Department of Energy*, Civ. No. 94-1039 M/WWD, http://www.nuclearactive.org/docs/CAAConsentDecreeI.html.
[350] Interview with author.

would happen next. A local newspaper noted that the real fire "eerily matched" the wildfire scenario modeled in the environmental impact study.[351]

More importantly, however, LANL officials took advanced preventative measures, including cutting fire lanes around LANL's main storage site for radioactive wastes. The 2000 Cerro Grande Fire reached within a half-mile of the TRU wastes, but didn't jump those fire lanes. During Congressional hearings in 2006 on potential restrictions on the public's right to comment on NEPA processes, New Mexico Representative Tom Udall cited Coghlan's comments to the 1999 LANL SWEIS as an example of how public comments enhance public safety and lead to better decisions at federal agencies.

Nuke Watch and CCNS have also had some success at pushing NMED to include stricter regulations for cleanup efforts and to make information more publicly accessible. In August 2007, NMED issued a new draft solid waste permit for LANL covering hazardous and mixed hazardous radioactive wastes. The previous permit had expired in 1998, but was "administratively extended" by NMED for nearly a decade, meaning there wasn't a permitting process for a total of twenty years whereby the public could address issues at the site with the contractor and regulatory agencies and ensure funds were being spent to address contamination and commitments made. CCNS and Nuke Watch began pressuring NMED in 2002 to release a new draft permit. They also submitted extensive formal comment to NMED to strengthen the final permit as part of state-mandated cleanup at LANL. From 2009 through 2010, Nuke Watch and CCNS were intimately involved in the LANL Hazardous Waste Permit negotiations and hearings involving the

[351] Nuclear Watch New Mexico, "Goodness, Gracious, Great Balls of Fire! Cerro Grande Fire Illuminates Past and Present Dangers at Los Alamos Lab," Nuclear Watch New Mexico Newsletter, Vol. 1, Issue 2, August 2000.

Lab and NMED. Throughout the process, Nuke Watch focused its efforts on and succeeded in obtaining an electronic Information Repository and e-mail notifications of permit changes as a means of making information more available to the public.

Community group efforts with regards to LANL have not been able to overcome some of the challenges that led to successful remediation efforts at other sites like Fernald. Although acknowledging a "pretty good working relationship" with NMED, groups in New Mexico expressed frustration at limited "check-the-box" opportunities for public involvement.[352] One of the ongoing issues is that groups believe the public should be included in decisions before they are presented for formal comment. Issues of to what extent and at what point in the process the public should be involved have become particularly salient as the state of New Mexico and DOE begin the process of renegotiating the 2005 Consent Order. According to Coghlan, "The New Mexico Environment Department thinks that they can extend the Consent Order and allow for public comments only after they've issued a draft. This is after the fact, rather than bringing in the public and groups during the draft phase."[353] While the state has always upheld its legal obligations for public involvement at specific stages during the RCRA permitting process, communities that are affected by decisions believe there should be meetings and negotiations before the agency presents decisions or policies to the public. Pete Maggiore, a former NMED secretary now with the NNSA Los Alamos Field Office on environmental management matters, agreed. He argued that the state would be more successful with public participation efforts and that processes would also be more

[352] Interviews with author.
[353] Interview with author.

efficient if it established ongoing relationships to develop trust and engaged in ongoing conversations to address issues. Maggiore put it this way:

> I also believe there should be Consensus versus Informed Consent. Let me explain. Public officials in this state are unsuccessful with public outreach/public participation issues because they don't establish relationships. Establishing relationships and trust are the most important things. You have to realize that not everyone has to agree, but you do have to listen and try and make a connection with people. It's a noble vision to get people to stipulate to a list of issues, but it may result in the process taking far longer than if you had simply had a conversation – especially if you're expectations are different from the people you're trying to convince.[354]

For its part, NMED has attempted to address public concerns about participation. It holds regular quarterly meetings with the key community organizations, including Nuke Watch, CCNS and SRIC, allowing the groups to ask questions and to present information. The NMED Hazardous Waste Bureau has also tried to incorporate public concerns, to make information more available, and to help the public understand how to participate in processes. As of this writing, NMED is engaged in a big push to make documents related to the sites it regulates publicly available online. NMED views the effort as a way to make information more accessible to the public and says it will also save the agency time in not having to respond to requests for information about permits.[355] In addition, the bureau now posts hearing and comment notices in Spanish and uses translators in public meetings to serve the Spanish-speaking population. The bureau also meets with the public more than it previously did. John Kieling, the Hazardous

[354] Quoted from "Interview with Pete Maggiore, former NMED Secretary, March 1, 2011", Kathryn Roberts, "Public Participation in the Environmental Permitting Process: Development of a Public Involvement Plan for Stakeholders in Northern New Mexico," Master's Project, Duke University, 2011, p. 56, http://dukespace.lib.duke.edu/dspace/bitstream/handle/10161/3574/Roberts_Final_MP_Report%284-29-2011%29.pdf?sequence=1.

[355] John Kieling, Chief of Hazardous Waste Bureau, New Mexico Environment Department, Interview with Author.

Waste Bureau chief at NMED, noted that he spends time trying to educate people about what the Department regulates. Often the public believes NMED regulates more than it does and it can be difficult to explain what is in the department's purview. Furthermore, Kieling and his department have to explain that public hearings usually only cover a specific scope of an issue, but members of the public show up wanting to give input on other topics. In Kieling's experience, members of the public who aren't informed or are misled, get disenfranchised. By contrast, the feedback NMED gets on issues from groups like Nuke Watch and SRIC are generally usefully because they are "well-informed and understand the process."[356]

The decide-announce-defend model is also the status quo for DOE public involvement efforts at LANL. The public has opportunities to submit comments at hearing or written comments under specific processes required by RCRA or NEPA. However, as we saw in the case of Fernald, developing relationships and providing meaningful public participation in decisions before they are made contributes to more successful policy outcomes, increased perceptions of the legitimacy of decisions and greater public trust in agencies.

DOE does maintain a Northern New Mexico Citizen Advisory Board (CAB) for environmental remediation efforts. The CAB is well-representative of Northern New Mexico, with members ranging from former lab employees to concerned individuals, to individuals representing pueblos. Scott Kovac noted, however, that the CAB isn't an independent thinking entity and that one can view the "influence of DOE on the CAB."[357] Part of the issue is that CAB members have a lot to learn, so when someone from the lab

[356] Interview with author.
[357] Interview with author.

"tell them that something will cost too much, they believe it."[358] As a result, "they can't all agree on how tough to be with the laboratory on cleanup levels."[359] Another challenge for the CAB is that frequently the only member of the public in attendance is Scott Kovac. Low public attendance may be a result of the fact that the meetings are time-consuming, held once per month during the day and that much of the meeting is concerned with minutes from previous meetings and technical presentations. Thus, CAB meetings aren't generally very public friendly. On the positive side, because he is the only member of the public in attendance, Kovac noted that he is often able to make presentations about environmental issues at LANL for the CAB's consideration and he can also interject questions when lab officials make presentations. Although Kovac wishes the CAB were more effective than it is, he noted that it is useful for making publicly available information about remediation efforts and lab presentations. According to Kovac, "The CAB gets information that the lab wouldn't give me and the CAB can request a presentation from the lab or WIPP."[360] By participating in CAB meetings, Kovac can get this same information and use it to monitor efforts, make recommendations and more broadly inform the public.

Another key challenge is that the contractor at LANL has not viewed engaging the public as necessary, even though there is a community involvement plan in the permit for environmental remediation efforts. Several groups expressed concern that the LANL contractor has withheld information about contamination and efforts to address it, and not held regular public meetings. Groups noted that the lack of information makes it difficult to educate the public before legally mandated public hearings or comment periods.

[358] Interview with author.
[359] Scott Kovac interview with author.
[360] Interview with author.

Furthermore, although the state and DOE must provide legally mandated public involvement opportunities, the contractor doesn't view any such obligation. Scott Kovac noted that NMED "has to return my phone calls. The DOE field office, which is comprised of civil servants, has to return my call. However, the contractor doesn't. There are only 100-150 DOE employees for 10,000 LANL employees."[361] Lack of public accountability and asymmetrical staffing and resource issues pose significant challenges for state and federal agencies to provide adequate oversight of contractors. They also raise fundamental questions about the ability of regulators to ensure that the contractor acts in the best interests of public health, safety and environmental protection.

WIPP

The Waste Isolation Pilot Plant (WIPP) is the nation's only deep geologic repository for permanent disposal of TRU waste that is the byproduct of the nuclear weapons program. TRU waste is long-lived and must be isolated to protect public health and the environment. The WIPP site, located in southeast New Mexico about 26 miles from Carlsbad, was chosen as a national repository because it contains salt beds that are free of flowing water. In theory, after depositing hazardous and radioactive wastes in the mined beds, salt would collapse and seal off the waste, thus protecting the environment and human health. WIPP's story began in 1957 when the National Academy of Sciences concluded that salt beds "promised the most practical immediate solution" for the geological disposal of long-lived radioactive waste.[362] It took another twenty years before the U.S. Atomic Energy Commission, DOE's predecessor agency, decided to explore a salt bed close to the town of Carlsbad, New Mexico. The site was constructed in the

[361] Interview with author.
[362] Department of Energy, WIPP Chronology, February 5, 2007, http://www.wipp.energy.gov/fctshts/Chronology.pdf.

1980s but the first waste shipment didn't arrive until March 26, 1999, after much political wrangling. TRU wastes are deposited 2,150 feet underground in rooms that were mined from the salt bed. Until two isolated accidents at WIPP in February 2014 (discussed in more detail later), 22 DOE sites from around the country were shipping TRU waste to WIPP for permanent disposal as part of their remediation efforts. Before operations at the site were halted in February 2014, the site had received 11,894 shipments with 171,064 waste containers and 91,265 cubic meters of TRU waste.

The Southwest Research and Information Center (SRIC), founded in 1971 by individuals who were among Ralph Nader's original Nader Raiders, was one of the first groups to organize around health and environmental concerns of nuclear weapons facilities in New Mexico. SRIC's mission incudes ensuring citizen participation in decision-making and securing environmental and social justice. It also serves as a technical assistance group to other community groups in New Mexico. In 1978, SRIC filed a Freedom of Information Act request to obtain and make public a 1977 Draft Environmental Impact Statement describing the WIPP facility. In 1978, a DOE Task Force issued a draft report discussing WIPP's purpose, including its possible use as a high-level waste (HLW) repository. Hundreds of citizens turned out for public hearings held in New Mexico to oppose the site. As a result of a lack of public confidence in DOE's self-regulation of radioactive waste, the state of New Mexico also began to get involved for planning for WIPP in the late 1970s.[363] At several key points in the process to open the WIPP facility, SRIC and other environmental groups have worked with the State of New Mexico to ensure stronger safety requirements in the permits to operate the

[363] Supplemental Stipulated Agreement Resolving Certain State Off-Site Concerns Over WIPP *New Mexico v. Department of Energy,* Case No. CA 81-0363 JB (D. N. Mex., December 27, 1982), supra note 43, at 18.

site in order to protect the environment and worker and public health. However, over time, permits have been diluted, and SRIC asserts, and DOE's own investigations have revealed, that the weakening of oversight directly contributed to the radioactive release at WIPP on February 14, 2014 that has halted operations since.

There was never universal agreement about opening the WIPP site. On the one hand, the local community in Carlsbad has long-supported WIPP. Indeed, the idea of siting a geological disposal facility in Carlsbad came from prominent individuals within the community who advocated for WIPP throughout the development process and challenged state legislators who opposed the site.[364] The Carlsbad community has allied with the federal government on the issue and doing so has brought DOE-sponsored socioeconomic development to the locality and region. On the other hand, concerned citizens in other areas of the state, especially Albuquerque and Santa Fe, and the state of New Mexico have historically challenged the site and called for stronger measures in permits for the site to ensure public health, safety and environmental protection. Don Hancock, who began as a volunteer at SRIC in 1975 and is now director of the nuclear waste program, said that the organization began to focus much more on nuclear waste issues when DOE announced on January 22, 1981 that it would open WIPP by 1986. DOE's unilateral announcement mobilized both the state of New Mexico and citizen groups to action and raised public consciousness of nuclear issues in the state. According to Don Hancock, "It put the issue on the radar map because everyone wanted more information."[365] SRIC has asserted that DOE has essentially used WIPP as a financial and public relation's centerpiece of the agency's "cleanup" efforts since it only will handle

[364] Chuck McCutcheon, *Nuclear Reactions: The Politics of Opening a Nuclear Waste Disposal Site* (Albuquerque: University of New Mexico Press, 2002), see especially chapter one.
[365] Interview with author.

about two percent of DOE's existing nuclear weapons waste. SRIC has long questioned whether the site is scientifically sound. The organization asserts that the site poses health and environmental risks because of oil and gas drilling near the site and threats posed by transportation of wastes to the site. SRIC points to the DOE's own conclusions in environmental impact statements for the site that is safer to leave nuclear weapons waste in existing storage sites for up to 100 years rather than ship them to WIPP.[366]

For more than thirty-five years, SRIC has analyzed and provided technical information and analysis about WIPP and state and federal nuclear waste storage and disposal policies. It has been actively engaged in an array of activities, including litigation with other national environmental groups and the state of New Mexico, participation in permitting processes and educating communities, policy makers, and the media. SRIC staff also helped to found another organization, Concerned Citizens for Nuclear Safety (CCNS), with the purpose of educating and mobilizing citizens in Santa Fe to address concerns about waste shipments from LANL to WIPP and the nuclear legacy at LANL.[367] SRIC, along with CCNS and Nuclear Watch New Mexico, organized protests and mobilized citizens, getting hundreds to turn out for environmental impact statement hearings and to submit comments. One journalist characterized SRIC as the "main field general in the environmentalists' unending war against the project."[368]

As a result of a series of legal challenges from 1981 until 1999 by citizen groups, including SRIC, other national environmental groups and the state of New Mexico, operations became subject to regulation by the state of New Mexico and the

[366] Don Hancock, "WIPP — Why It's Still Unsafe," *The Workbook*, Southwest Research and Information Center, 1997.
[367] Interviews with author; Concerned Citizens for Nuclear Safety, "About Us," http://nuclearactive.org/CCNS/ccnsindex.html.
[368] McCutcheon, 2002, p. 128.

Environmental Protection Agency. Regulation by the New Mexico Environment Department (NMED) and the EPA was viewed as necessary for countering DOE's historic secrecy and self-regulation. As a result of external regulation and oversight, information about the site became more available and permitting processes became more open to public participation. This in turn strengthened measures in the permit to address health and environmental concerns of the site. The opening of decision processes to public debate, regularly scheduled exchanges of information with interested parties, the introduction of strong, independent regulators, and a regulatory framework that took into account public health and the environment were key to the site's eventual opening.[369]

A full examination of all the lawsuits and injunctions filed to prevent or delay the opening of WIPP are beyond the purview of this project. However, a few key decision points merit attention. In addition to a lawsuit filed by SRIC in 1981, then-New Mexico Attorney General Jeff Bingaman filed a lawsuit alleging violations of state laws by DOE and the Department of the Interior and asserting that the unilateral decision to proceed was counter to the state's understanding of the "consultation and cooperation" provision in authorizing legislation for WIPP passed by Congress in 1979.[370] The lawsuit was a turning point in giving the state of New Mexico greater leverage in decisions about the WIPP transportation program. The state and DOE settled the lawsuit with a "Consultation and Cooperation" Agreement in July 1981, which included agreement for more study and communication with the state, as well as addressing concerns such as emergency

[369] L.G. Eriksson and G.E. Dials, "Main Contributors of External Acceptance of the Waste Isolation Pilot Plant Transuranic Waste Repository," Paper delivered to the International Atomic Energy Agency, IAEA-CN-78/88, No Date.
[370] *Bingaman v. Department of Energy,* Case No. CA 81-0363 JB (D. N. Mex., July 1, 1981)

response and highway improvements.[371] In 1982, DOE and New Mexico signed an additional agreement to address the state's concerns about liability for WIPP-related nuclear incidents, emergency response preparedness, the monitoring of WIPP waste during transportation, and state highway upgrades.[372] Following the *Leaf v. Hodel* decision (discussed in chapters two and three), DOE and New Mexico also agreed in 1984 that WIPP must comply with all state, federal and local laws and regulations, including those by U.S. EPA. In 1986, EPA asserted that WIPP must comply with Resource Conservation and Recovery Act (RCRA) of 1976 for disposal of mixed (hazardous and radioactive) waste.[373] In an attempt to address additional concerns by the state, DOE agreed in 1987 to a modification to the 1981 agreement with the state that the transportation of waste to WIPP would comply with applicable U.S. Department of Transportation (DOT) and U.S. Nuclear Regulatory Commission (NRC) regulations, and that all waste would be shipped to WIPP in NRC-certified packages.[374] In July 1990, U.S. EPA formally authorized New Mexico Environment Department (NMED) to regulate radioactive mixed wastes, including TRU mixed wastes destined for WIPP, in New Mexico.[375] A further amendment to the Consultation and Cooperation agreement in 1991 obliged DOE to comply with the EPA's radiation and protection standards.

Another legal battle, over land acquisition, which was required for the site's operation, emerged in 1991. Acknowledging the need to review substantial objections

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[371] Stipulated Agreement Between DOE and the State in State of New Mexico *ex rel. Bingaman v. Department of Energy,* Case No. CA 81-0363 JB (D. N. Mex., July 1, 1981).
[372] Supplemental Stipulated Agreement Resolving Certain State Off-Site Concerns Over WIPP *New Mexico v. Department of Energy,* Case No. CA 81-0363 JB (D. N. Mex., December 27, 1982).
[373] Federal Register, Vol. 51, No. 128, p. 24504, July 3, 1986.
[374] Second Modification to the July 1, 1981, "Agreement for Consultation and Cooperation" on WIPP by the State of New Mexico and U.S. Department of Energy (executed August 4, 1987).
[375] Federal Register, Vol. 55, No. 133, p. 28397, July 11, 1990.

raised in a final round of public hearings held to produce a final environmental impact statement (EIS) for WIPP, then-Energy Secretary Admiral James Watkins announced in June 1989 that the opening of WIPP would be delayed indefinitely. Secretary Watkins stated, "…WIPP will only open when I deem it safe and other key non-DOE reviewers are satisfied."[376] In 1990, Secretary Watkins approved a Record of Decision on a Final Supplemental Environmental Impact Statement to move forward with a phased implementation of the site, which would be preceded by a five-year test phase.[377] At the same time, Secretary Watkins announced that 1991 would be the earliest possible date for the first shipment of waste to arrive at the site. In order to proceed with plans, DOE needed to withdraw lands from public use. Secretary Watkins believed that it was within DOE's purview to acquire land for the site administratively through the Department of Interior, rather than legislatively through Congress. By 1991, he was anxious for waste shipments to begin because the site's opening was critical to addressing radioactive waste problems at other nuclear weapons sites and improving DOE's image of handling the Cold War legacy.[378] At the time, Idaho Governor Cecil D. Andrus was blocking further shipments of radioactive waste from Rocky Flats, Colorado to the Idaho National Engineering Laboratory, which DOE was using as an "interim" storage site until the permanent repository opened. New Mexico's Attorney General Tom Udall challenged the acquisition arguing that the federal government couldn't prove that the underground mine's walls would not collapse on workers. Udall was keen to take on the DOE because he was concerned about the agency's penchant for secrecy. He had worked with his

[376] James Coates, "Bomb Factory Questions Grow," *Chicago Tribune*, June 25, 1989, Section 1, p. 26.
[377] Federal Register, Vol. 55, No. 121, p. 25689, June 22, 1990.
[378] McCutcheon, 2002, p. 126.

father on legal cases representing Navajo Native Americans who had been exposed to radiation while mining uranium for nuclear weapons and representing Mormons in Utah who inhaled radioactive debris downwind from nuclear weapons testing at the Nevada Test Site. SRIC, Concerned Citizens for Nuclear Safety, Natural Resources Defense Council, and the Environmental Defense Fund joined the lawsuit to require, among other things, that WIPP not open until it complied with RCRA.

The court ruled in favor of Attorney General Udall and the environmental groups, delaying shipments to the site and forcing DOE to wait to begin any operations until Congress debated and passed the WIPP Land Withdrawal Act of 1992 (WIPP LWA).[379] WIPP LWA built on previous agreements between DOE and the state of New Mexico and legislatively established a regulatory framework for the site. Most significantly, WIPP LWA designated U.S. EPA as a primary independent regulator at WIPP with authority to determine whether the repository is suitable as a long-term disposal facility and established a framework for governing the transportation of TRU waste from DOE sites around the country to WIPP.[380] WIPP LWA was also significant in that while DOE initially intended to dump both TRU and high-level waste (HLW) at WIPP, Congress banned high-level waste and spent nuclear fuel at the repository. Under WIPP LWA, Congress also directed EPA to repromulgate radiation protection standards, previous attempts of which had failed after a court partially remanded and vacated standards in 1987.

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[379] S*tate of New Mexico et al v. James D Watkins*, 969 F. 2d 1122.

[380] The Waste Isolation Pilot Plant Land Withdrawal Act, Public Law 102-579, as amended by Public Law 104-201, (H.R. 3230, 104th Congress), http://www.wipp.energy.gov/library/CRA/BaselineTool/Documents/Regulatory%20Tools/10%20WIPPLWA1996.pdf.

Once WIPP became subject to regulation by U.S. EPA and NMED, it meant more opportunities for exchange of information and more access points for the public through commenting periods and hearings formally required under federal and state regulatory laws. For example, after the EPA promulgated new radiation standards in December 1993, there was a four-year iterative information exchange process between DOE and EPA for compliance certification of the site that included more than 50 public meetings and more than 100,000 pages of information. In addition to those institutionalized public meetings, DOE's Carlsbad Area Office reported an additional 75 public meeting opportunities between 1996-1999.[381] Hearings, comment periods and release of information provided opportunities to learn about the site and for citizens to voice support or concerns both in meetings and to the media.

Over the years, SRIC has engaged in RCRA permitting processes for WIPP's operation in order to ensure that health and environmental concerns are adequately addressed. SRIC counts delaying the opening of WIPP until the RCRA permit for the site was strengthened among the organization's successes. According to Don Hancock, "We spent quite a bit of time on the WIPP RCRA permitting processes because it provided leverage to get things done. We used RCRA processes because it forced the government and corporate contractors to sit down with the community and allowed us to get additional agreements from DOE or contractors beyond what was required in the permits. We have had some very good results."[382] For example, Hancock noted that they were able to negotiate a prohibition on remote-handled waste, which is more dangerous than

[381] Dennis S. Hurtt, William P. Whiting, Chris L. West and Daniel L. Balduini, "Developing Broad Based Stakeholder Acceptance for the Waste Isolation Pilot Plant," Paper for the WM '99 Conference, February 28-March 4, 1999, http://www.wmsym.org/archives/1999/45/45-5.pdf.
[382] Interview with author.

contact-handled waste, in the original RCRA permit. For the first six years of the site's operation, there was no remote-handled waste deposited at the site because of the permit. In another example, SRIC, other citizen organizations, and government agencies opposed a DOE modification to the permit that would have allowed waste drums to be opened at the site and would have allowed items to be shipped to WIPP that are prohibited from disposal — explosive, ignitable, corrosive, reactive materials, or large amounts of liquids, among others. "It wasn't perfect, but it was a reasonably strong permit and we had an impact. The original permit included more safety requirements for the site because it had a strong technical basis and there had been a lot of public pressure and involvement. It was much stronger than what would have been the case if we had not been involved," according to Hancock.[383] However, Hancock also noted that engaging in permitting processes is very time consuming and generally not very public friendly. There is a lot of technical information presented and exchanged, and participation required spending a lot of time in hearings.

In addition to participating in formal mechanisms, SRIC also made an innovative suggestion for public involvement at WIPP. Since 2007, at SRIC's suggestion, DOE and its contractor have sent draft versions of permit applications to NMED, SRIC and other public interest groups, giving them a chance to view and provide feedback so that DOE and its contractor can address concerns before the application is formally submitted.[384] The pre-submittal meetings have allowed information exchanges and additional public involvement opportunities not required by RCRA. Furthermore, according to Don

[383] Interview with author.
[384] Ricardo Maestas, New Mexico Environment Department, Interview with author.

Hancock, New Mexico is the only location to his knowledge where DOE has employed such pre-submittal meetings as a tool to extend public engagement.[385]

Don Hancock observed that while there continues to be a lot of public pressure and involvement, the rather strong regulatory permits have weakened over time. According to Hancock, DOE has taken advantage of more receptive state administrations in New Mexico over time to dilute safety requirements and to expand operations at the site. For example, despite originally prohibiting remote-handled waste at the site and despite public opposition to it, NMED agreed to a permit modification to allow the waste. At the heart of ongoing concerns are continuing questions about whether external oversight and regulation are sufficient to ensure that operations take into account the health and safety of the public and workers, and environmental protection. SRIC and concerned citizens expressed a lack of trust in DOE because of history of secrecy and violations of promises.[386]

The February 14, 2014 WIPP accident demonstrates problems that arise from weakening regulatory requirements and external oversight of DOE. As Don Hancock observed, "The original WIPP permit included a number of the safety provisions that were directly responsible for the fact we didn't have the kind of disasters that occurred in

[385] Don Hancock, Email to Author.

[386] One example citizen groups cited of broken promises at WIPP was that DOE had said it would not emplace waste before receiving a permit from the state. However, DOE began purely radioactive waste shipments to WIPP in 1999 (the state only has authority to regulate mixed wastes). When NMED issued the permit, it prohibited DOE and the contractor from burying any mixed waste underground at WIPP in the old and crumbling rooms of Panel 1 where DOE had buried pre-permit waste that was purely radioactive. NMED underscored in the permit that the pre-permit buried waste was unregulated and therefore workers should not be exposed to it and regulated waste should not be mixed with it. Before lawsuits by NMED and SRIC could be heard in courts, NMED and DOE settled on permit modifications without involving the public. DOE gave NMED $60,000 to bolster its regulatory role and NMED changed the permit language to allow mixed waste to be buried in Panel 1.

February 2014."[387] The explosion from one of the drums that caused the release of plutonium and americium is among 368 storage canisters emplaced at WIPP that originated from LANL that were packed with sWheat Scoop kitty litter, a wheat-based absorbent. The DOE's investigation of the accident confirmed that the explosion was a result of an exothermic reaction between incompatible materials within the drum, which resulted in internal heating that led to pressure buildup of combustible gases that exceeded the drum's venting capacity.[388] The drum burst open, releasing its contents, and the combustible gases and solids ignited and spread among the waste materials.

The DOE's investigation acknowledged that the accident was preventable and identified two root causes. On the LANL side, the investigation charged that the contractor, Los Alamos National Security, LLC, failed to understand and implement the LANL Hazardous Waste Facility Permit and Carlsbad Field Office Controls by using a wheat-based absorbent kitty litter instead of directed inorganic absorbent kitty litter/zeolite clay in glovebox operations for nitrate salt-bearing waste. The result was noncompliant ignitable drum was generated, shipped and emplaced at WIPP. The investigation also found that there were systemic problems that caused the accident, namely that the Los Alamos Field Office (NA-LA) and National Transuranic Program/Carlsbad Field Office (CBFO) failed to ensure that LANL had adequately developed and implemented repackaging and treatment procedures that incorporated suitable hazard controls and included a rigorous review and approval process. NA-LA and CBFO also did not ensure that requirements under the RCRA permit, the WIPP

[387] Interview with author.
[388] U.S. Department of Energy, Office of Environmental Management, "Accident Investigation Report: Phase 2, Radiological Release Event at the Waste Isolation Pilot Plant, February 14, 2014," April 2015, http://www.wipp.energy.gov/Special/AIB_WIPP%20Rad_Event%20Report_Phase%20II.pdf.

Hazardous Waste Facility Permit, Waste Analysis Plan, WIPP Waste Acceptance Criteria, and the LANL Hazardous Waste Facility Permit were incorporated into operating procedures at LANL.

As a result of the radioactive release from the accident, half of the repository is in a contaminated state, according to the New Mexico Environment Department.[389] The accident also demonstrated the consequences of DOE's decisions to cutback on safety requirements to save money. The container that blast open was stored in a room about the size of a football field that was originally to have been sealed forever with a 12-foot concrete explosion isolation wall. Panels 1, 2 and 5 were sealed in this way after they were filled, while Panels 3 and 4 were closed with a steel bulkhead that didn't have an explosion isolation wall. DOE first canceled the blast proof bulkheads arguing that were too expensive. Over time, it also ignored requirements for the metal but not blast proof bulkheads. The blast, which took place in Panel 7, thus also affected Panel 6, which had been left open despite the fact that it had reached storage capacity. In addition, investigators have discovered in the aftermath of the accident that there was no accurate inventory of what was stored at the site. An investigation by DOE concluded that the release of radioactive material into the environment was preventable and a result of "degradation of key safety management programs and safety culture."[390] It found that the contractor is not fully compliant with federal regulations, that it doesn't have effective nuclear safety and radiation protection programs, or a comprehensive emergency

[389] Ricardo Maestas, New Mexico Environment Department, Interview with Author.
[390] U.S. Department of Energy, Office of Environmental Management, "Accident Investigation Report, Phase 1: Radiological Release Event at the Waste Isolation Pilot Plant on February 14, 2014," April 2014, https://www.env.nm.gov/NMED/Issues/WIPP_docs/Final%20WIPP%20Rad%20Release%20Phase%201%2004%2022%202014_0.pdf, p. ES-6.

management system, among other issues. Furthermore, the investigation found that DOE has failed in overseeing the field office and the contractor, and "correcting repeated identified issues involving radiological protection, nuclear safety, Integrated Safety Management (ISM), maintenance, emergency management, work planning, and control and oversight."[391]

DOE's contractor at the site, Nuclear Waste Partnership (a consortium of URS Energy and Construction and Babcock and Wilcox Technical Services Group, with AREVA Federal Services as a major subcontractor) is currently updating safety mechanism and procedures. The installation of new High Efficiency Particulate Air (HEPA) filters was one of the main safety upgrades to address the contamination. However, the filters and ventilation equipment have impacted recovery and maintenance because they brought a whole host of challenges. Ventilation equipment was damaged during transit to the site. By restricting airflow, the filters have reduced ventilation, which in turn has restricted the number of workers who can enter the contaminated mine, and the amount of machinery that can operate.[392] The WIPP closure has also affected DOE remediation across the nuclear weapons complex as DOE sites that were planning to ship their TRU waste must now store it on site.

The accident has reinforced the salience of environmental, health and safety issues about the site. It also elevated questions about whether DOE can be trusted. According to NMED, since the accident and the revelations of problems, even some of

[391] U.S. Department of Energy, Office of Environmental Management, "Accident Investigation Report, Phase 1: Radiological Release Event at the Waste Isolation Pilot Plant on February 14, 2014," April 2014, https://www.env.nm.gov/NMED/Issues/WIPP_docs/Final%20WIPP%20Rad%20Release%20Phase%201%2004%2022%202014_0.pdf, p. ES-8.
[392] Ricardo Maestas, New Mexico Environment Department, Interview with Author.

the supporters of the site are questioning it or looking at issues differently. "DOE is in a position where it is having to mend trust, even among its supporters," according to Ricardo Maestas, Acting Manager for the WIPP Group at NMED's Hazardous Waste Bureau.[393] As a result, DOE and the contractor are holding regular town hall meetings to address concerns, which are attended by regulators, Congressional staff, community members and citizen organizations. The meetings are also live streamed on the internet and presentations are posted with a list of questions asked and a response to those questions to make information more broadly accessible. According to Maestas, "DOE is trying to be more transparent and the meetings have helped restore trust."[394] Don Hancock also noted that the accident has made regulators, and DOE and it contractor more receptive to the technical information and concerns they raise about the site. Regulators and DOE have acknowledged that they shouldn't have ignored or downplayed the concerns SRIC has raised about the site. Following the accident, there are ongoing meetings about permit modifications for WIPP.[395] There are monthly calls between the Carlsbad Field Office and NGOs. This processes is allowing for greater public input not formally required by state or federal laws, though the application will also go through a formal public comment period after it has been submitted.

In sum, the efforts of citizen groups have made a difference at WIPP. In particular, SRIC has played an important role in providing technical analysis and information to the public, policymakers and the media. It has also played a vital role in mobilizing citizens and generating public involvement even on highly technical issues. SRIC's watchdogging efforts have been critical to ensuring that interests of public and

[393] Interview with author.
[394] Ricardo Maestas, New Mexico Environment Department, Interview with Author.
[395] Ricardo Maestas, New Mexico Environment Department, Interview with Author.

worker health and safety, and the environment are considered, especially in the permitting for the site. SRIC's efforts have been bolstered when the state of New Mexico has been willing to assert its regulatory muscle.

However, the kind of grassroots participation that contributed to successes at sites like Fernald and LLNL have been less effective at WIPP primarily because of differences in the locus of decisions about the sites. Whereas decisions about remediation efforts at Fernald and LLNL were local, decisions about WIPP discussed in this chapter, including opening the site and land withdrawal, were made in Washington, DC by DOE headquarters and Congress, not by local DOE or state officials. The nature of DOE headquarters and Congress and their distance from grassroots constituencies do not provide the same possibilities for affecting change as when decisions are primarily under the purview of state and local institutions. SRIC's efforts to mobilize citizens have been designed to impact New Mexico officials, including the Congressional delegation. However, the organization has used litigation as a strategy because it realizes that grassroots pressure alone isn't sufficient in the case of WIPP. According to Don Hancock, "Litigation was necessary to really get DOE and congressional attention because they couldn't get WIPP open until they dealt with the court decisions that stopped the opening."[396]

Conclusion

This chapter has attempted to demonstrate that even at sites with ongoing national security missions, grassroots efforts have played an important role in holding DOE accountable for the health and environmental legacy of nuclear weapons production. At sites with ongoing missions, it has been more difficult to break the decide-announce-

[396] Email to author.

defend model of public participation, yet grassroots groups have still had some successes. At LLNL in California, citizen efforts produced novel ways of educating and involving the public in addition to legally mandated public participation mechanisms. Through both legally mandated and extra-legal public involvement efforts, Tri-Valley CAREs has been able to influence decisions about remediation at the lab's sites and obtain results that better protect health and the environment. While there are ongoing struggles for access to information and inclusion at LANL and WIPP in New Mexico, grassroots groups continue to press both the state regulatory agency and DOE for information and public inclusion in decisions before they are made. Since the accidents at WIPP in 2014, the contractor has been more pro-active in involving the public before it submits its permit application.

As other chapters have also sought to demonstrate, a key finding of this work is that ordinary people can educate themselves and develop expertise to make a difference in policy outcomes even on such scientifically and technologically complex issues as environmental remediation of nuclear weapons sites. Thus, DOE and contractors should include these community experts in decisions about sites as policies are being formulated, not just defend decisions made and seek comment after-the-fact. Studies of public involvement have concluded that greater public involvement processes can increase trust and contribute to stronger relationships between the public and state and federal agencies.[397] Furthermore, more intensive public involvement can lead to better quality decisions and also increase the legitimacy of decisions made.[398]

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[397] Kristi M. Branch and Judith A. Bradbury, "Comparison of DOE and Army Advisory Boards: Application of a Conceptual Framework for Evaluating Public Participation in Environmental Risk Decision Making, *The Policy Studies Journal*, Vol. 34. No.4 (2006).
[398] Thomas Beierle, "The Quality of Stakeholder Based Decisions," *Risk Analysis*, Vol. 22.

This chapter also found that DOE's culture of secrecy and self-regulation persists at sites with ongoing national security missions. External oversight and regulation is necessary to hold DOE and its contractors accountable. Yet challenges in doing so remain especially because of asymmetrical staffing and resources of regulatory entities vis-à-vis DOE and its contractors. Grassroots community organizations play an important role in filling the oversight void by continuously monitoring activities at the sites, pressing for greater involvement opportunities and making information available to the public and state agencies. Interviews of groups in California and New Mexico revealed that their efforts are bolstered when state regulatory agencies are more willing to use and enforce their regulatory authority.

No. 4. (2002); Thomas Beierle and J. Cayford, *Democracy in Practice: Public Participation in Environmental Decisions* (Washington, DC: Resources for the Future, 2002).

Chapter Six: Conclusions: The Criticality of Regulatory Change

The objective of this research was to examine the factors that contributed to the opening of the Department of Energy's (DOE) nuclear weapons complex to environmental regulation and public participation and to evaluate the significance of that shift. From the inception of the nation's nuclear weapons program in 1941, only a small group of experts was considered qualified enough to participate in decisions, which contributed to limiting the number of decision-makers and allowing the DOE and its predecessor agencies to maintain a policy monopoly over all aspects of nuclear weapons programs. For nearly five decades, the agency operated in secrecy and was inattentive to the health and environmental implications of nuclear weapons complex activities. Although macropolitical trends in American politics – specifically the emergence of a new social and environmental regulation regime in the 1960s and 1970s – opened up regulatory decision-making to public participation at an array of institutions, DOE and its predecessor agencies were insulated from this wave of reform until the 1980s. The agency used the rubric of "national security" to claim "sovereign immunity" from environmental, health and safety oversight and regulation. Until the end of the Cold War, the nature of the nuclear weapons complex, involving national security and secrecy, made it difficult to establish through legislation or regulatory guidelines an effective means for ensuring that threats to health and safety and environmental pollution as a result of nuclear weapons production received due attention.

Beginning in the mid-1980s, the political void in which the DOE and its predecessor agencies had operated began to open to outside actors, including state and federal regulatory agencies and the public. I have argued that the end of the Cold War

and the change in the international context allowed domestic actors to redefine nuclear weapons issues from the frame of "national security" and elevate public consciousness of the negative environmental, health and safety consequences of the nuclear weapons complex. In addition, internal factors within DOE, namely revelations in the late 1980s that the nuclear weapons complex infrastructure was crumbling and that there were extensive environmental pollution, health and safety problems, subjected the agency for the first time to intense media and public scrutiny, and Congressional inquiry. Once it was established that the DOE could not be trusted to regulate itself or act in the best interests of the public, DOE could no longer insulate itself from the same health and environmental regulations to which corporate entities had been obliged to comply for decades.

Chapter two of this dissertation examined the establishment of a labyrinthine regulatory framework through legislation and litigation that attempted to bring DOE to account as revelations of the extent of the threats to human health and the environment were revealed, and as missions at defense nuclear facilities changed following the end of the Cold War. The chapter also documented Congressional efforts over time to address the shortfalls of the regulatory regime by strengthening the enforcement authority of the Environmental Protection Agency (EPA), providing greater leverage to the states in oversight of nuclear complex sites and by making clear its intent that the public should have meaningful opportunities to participate in environmental decisions and processes. Chapter three showed the awakening and mobilization of communities across the country living downwind and downstream from nuclear weapons facilities to challenge and change DOE policies and practices. It demonstrated how the grassroots movement for

openness and accountability has engaged in political processes to obtain environmental and health justice. Through case studies at specific sites within the nuclear weapons complex, chapters four and five demonstrated the contributions of grassroots community organizations in educating and mobilizing the public and in providing an oversight mechanism to hold DOE and its contractors accountable and to obtain redress for the health and environmental legacy at nuclear weapons sites. The chapters highlighted the ability of "ordinary" individuals to educate themselves and develop expertise to meaningfully participate in environmental and health decisions. The case studies also demonstrated that when community-based grassroots groups and the public are involved early and continuously, there are better policy outcomes and decisions reached have greater legitimacy.

Despite the number of successes documented in this research, serious challenges remain. DOE has remediated the Fernald and Mound nuclear sites in Ohio and the Rocky Flats site in Colorado, but there is no real end in sight for addressing the extensive contamination and threats to public health at remaining sites dispersed across the country. As Former DOE Inspector General Gregory Friedman recently put it, DOE's efforts to "cleanup" the nuclear weapons complex "is the largest environmental remediation ever undertaken by mankind and the most technically challenging."[399] Although policy and decision-making processes with regards to environmental remediation are far more open today than they were during the Cold War, there are ongoing struggles between DOE's administrative and managerial approach to decision-making and the more popular democratic view of governance held by the states, community groups and concerned

[399] John R. Emshwiller and Gary Fields, "Massive Nuclear Cleanup Hobbled by Funding Shortfall," Wall Street Journal, November 1, 2015, http://www.wsj.com/articles/massive-nuclear-cleanup-hobbled-by-funding-shortfall-1446409369.

individuals. It remains difficult for states and the public to obtain information about sites and to participate in decisions that have great impact on their future. There is also ongoing administrative reluctance to involve the public in meaningful ways even though DOE, EPA and state agencies have institutionalized democratic procedures. Thus, as the nation continues to grapple with how to deal with the health and environmental legacy of the nuclear weapons complex, no less is at stake than questions about democratic governance.

This concluding chapter summarizes the major themes and contributions of this research, discusses some of the challenges ahead and proposes ideas for future research.

Democratic Governance and Regulatory Politics

One of the major themes of this work relates to macropolitical trends in American politics. Since the rise of the administrative state with New Deal politics, there have been ongoing struggles between administrative expertise, pluralism and a popular democratic view of governance.[400] The issue of nuclear weapons exemplifies the pinnacle of administrative power and the reliance on expertise for decision-making.[401] A more pluralistic view of administrative governance re-emerged with the new social and environmental regulation regime of the 1960s and 1970s. Though it came much later and required a change in the international context, even such a highly scientific and technologically complex issue area as nuclear weapons could not remain insulated from

[400] On the rise of the administrative state and New Deal politics, see: Sidney M. Milkis, *The President and the Parties: The Transformation of the American Party System since the New Deal* (New York: Oxford University Press, 1993).

[401] For a discussion on how nuclear weapons expanded executive and administrative power and its consequences for democratic governance, see Gary Wills, *Bomb Power*: *The Modern Presidency and the National Security* (New York: Penguin Books, 2010); For a discussion on commercial nuclear power, see Brian Balogh, *Chain Reaction: Expert Debate and Public Participation in American Commercial Nuclear Power*, 1945–1975 (Cambridge: Cambridge University Press, 1991).

the reforms of the public lobby era. This case study examining the shifts in regulatory politics across the nuclear weapons complex over time has confirmed other scholarly work demonstrating both the successes and the limits of the public lobby era reforms.[402] Although the policymaking process is more open, it is also more bureaucratic and it falls short of broadly democratic ideals. In particular, this research has shown how the new social and environmental regulation reforms legally structured public participation in environmental decisions at nuclear weapons facilities in a way that is after-the-fact, the so-called decide-announce-defend (DAD) model, which critics go so far as to contend has been disempowering for the public and communities. Since the 1980s, community-based grassroots groups have pressed for a more popularly democratic view of participation in administrative decision-making, though this idea has not yet been adopted wholesale at the DOE, nor even in some state regulatory processes.[403] To be sure, some communities, including those around Fernald, Mound and Hanford, have had success in getting DOE and its contractors to move toward a more popular and consensus based approach to decisions about the future of sites, but these are the exception, not the rule. For the majority of decisions, DOE and its contractors still maintain control over agendas and decisions.

In highlighting the ongoing ideational competition of governance between administrative expertise, pluralism and popular democracy in policymaking, this research more broadly shows the difficulty in constructing or deconstructing regulatory regimes. Although there are periods of reform, this research suggests that shifts in regulatory

[402] Sidney M. Milkis and Richard A. Harris, *The Politics of Regulatory Change: A Tale of Two Agencies* (New York: Oxford University Press, 1989.

[403] On the broader movement for community empowerment, see: Carmen Sirianni and Lewis Friedland, *Civic Innovation in America: Community Empowerment, Public Policy, and the Movement for Civic Renewal* (Berkeley, CA: University of California Press, 2001).

regimes tend to be incremental and the regime tends to adapt new dimensions. This research found a more evolutionary approach to regulatory regime change rather than a wholesale repudiation of the previous regime. While other studies have found reforms resulted in a more equal playing field among actors, the findings of this research suggest that as regulatory structures expand and create competition among a wider array of actors, it doesn't necessarily mean that all actors will have an equal say or that ambition will be made to check ambition, to use the words of James Madison.[404] In the case of the nuclear weapons complex, DOE and its contractors are still dominant in decision and policymaking processes, even though states and the public now have greater access. Furthermore, while there is greater accountability at DOE than previously existed, decision and policymaking processes are not as transparent as reformers have hoped.

In particular, the DOE's ongoing national security imperative has contributed to the resilience of administrative expertise and self-regulation at the agency. Although U.S. EPA and the states have some authority because of reforms, they often lack the regulatory teeth necessary to enforce agreements or penalize DOE or its contractors when agreements are violated. As a result, policy and program outcomes may be suboptimal and contractors aren't held to account. As Scott Kovac of Nuclear Watch New Mexico observed:

> "We're looking at a situation where government is regulating itself and that is not good. The process gets too coopted. DOE has oversight of itself and if a DOE site violates a DOE regulation, maybe they get fined a little bit, but basically they're just told too do better. Most of the time, however, the contractor doesn't fix the situation. A contractor might promise to cleanup, but there is no real oversight and no real penalties for contractors, and that is part of the problem."[405]

[404] James Madison, "The Structure of the Government Must Furnish the Proper Checks and Balances Between the Different Departments," Federalist No. 51, *Independent Journal,* Wednesday, February 6, 1788.
[405] Interview with author.

Contractors can also take advantage of the regulatory structure. A February 2015 Government Accountability Office report put DOE's Office of Environmental Management on a list for being at high risk for fraud and waste especially because the agency doesn't effectively monitor, oversee or manage its contracts.[406] Furthermore, the regulatory structure does not mandate that contractors involve the public.

Interviews also revealed that the multidimensional regulatory structure has inhibited coordination among grassroots groups. For example, even though mining and milling of uranium is part of the nuclear weapons production process, organizations working on these issues have traditionally not coordinated with organizations working on nuclear cleanup issues because federal and state level regulatory process are entirely different. As we have seen DOE takes the lead on remediation at nuclear weapons sites, but the Nuclear Regulatory Commission is the lead agency for permitting and remediation related to mining and milling. In addition, because state-level regulatory processes differ, strategies that are effective for involving the public in decisions at a site in one state may not be as effective or replicable in another.

This study of the regulation of the nuclear weapons complex has also raised questions about who should define the "public interest" and who does define it in practice. DOE continues to employ its "national security" imperative to shield decisions from the public view and asserts that it can make decisions in the public interest. Based on the agency's historical record of neglect of health and environmental concerns, states and community-based grassroots interest groups have asserted that the public cannot simply assume that the federal government and its contractors will always act in its best

[406] Government Accountability Office, "High Risk Series: An Update" (Washington, DC: GAO, February 2015), GAO-15-290, http://www.gao.gov/assets/670/668415.pdf.

interest. Former Idaho Governor Cecil D. Andrus recently asserted that DOE has never truly adapted "a culture of transparency and engagement that engenders public trust and confidence."[407] And yet, according to Andrus, "The public interest is served when governmental decisions are made in the open. The Energy Department says it worries about a chilling effect on the ability of a government agency to discuss and consider options, but experience suggests that what government agencies really worry about is that disclosure of their plans will empower the public to take action to oppose those plans."[408]

Community-Based Interest Groups, Public Participation and Struggles for Inclusion

While this research relates to broader trends in regulatory politics, it has sought to a greater degree to examine interactions within the regulatory structure. Much of the scholarly interest in regulatory politics has focused on the national level. This research has focused on an issue area that has been opened over time to both federal and state regulation. Furthermore, while acknowledging the importance and role of elite actors, this research has placed community-based grassroots groups at the center of analysis. In so doing, this research has sought to contribute a better understanding of the dynamics of a multidimensional regulatory framework that structures interactions between communities, states and the federal government. It has also sought to evaluate the opportunities for public participation in policy and decision-making processes at the federal, state and local level since processes were opened following the end of the Cold War.

[407] Cecil D. Andrus, "Holding the Department of Energy accountable in Idaho," *Bulletin of the Atomic Scientists*, October 16, 2015, http://thebulletin.org/holding-department-energy-accountable-idaho8807.
[408] Andrus, October 16, 2015.

Throughout this dissertation, I have argued that even in a policy area as scientifically and technologically complex as the remediation of the nuclear weapons complex, grassroots groups have been consequential in pressing for regulatory reform and in bolstering regulatory processes. These groups comprised of "ordinary" individuals have organized themselves to ensure that policy outcomes are responsive to public concerns. In this case, which repeatedly documented the inability of the government to effectively regulate itself, I have argued that community-based groups have been a vital mechanism for bringing attention to critical issues and using laws to help rectify federal wrongdoing. However, asymmetrical resources and access place community groups at a power disadvantage vis-à-vis DOE, its contractors and even regulatory agencies and national interest groups. Thus, successes in the pursuit of health and environmental justice have been more difficult to achieve. Although they have formed a network to work in concert on national policy issues and have had some successes, this research found that community-based grassroots groups have been most successful in participation at local sites. It has been more difficult for community-based grassroots organizations to effect change at DOE headquarters or in Congress, though they have found and worked with partners in those institutions from time to time.

I found several commonalities across the range of groups studied that have made them effective participants in regulatory politics. First, all of the groups studied in this research are committed to research that ensures a strong factual foundation. Nearly every group said they would only speak to issues that they understood. Second, all of the groups were committed to advocacy that brings the community's experiences to administrators, elected officials and other decision-makers. Third, groups were most

successful in addressing environmental problems, promoting solutions and increasing democratic decision-making when they were able to partner with state and federal regulators.

One of the persistent questions in studies of regulatory politics is "the degree to which administrators use public feedback to inform the content of government regulations."[409] From this question two others follow: to what extent does the public have access and to what extent does the public participate. According to DOE, EPA and state officials, as well as community groups, there is far more public participation now compared to before the 1990s. Furthermore, as one EPA official noted in an interview, "expanded public participation has been the result of active citizen groups pushing the agencies to do more and provide more participation."[410] Interviews revealed that while DOE is committed to public involvement, it hasn't implemented it in the same way as other agencies, especially EPA. The culture of secrecy is still persistent at DOE, whereas other agencies, like EPA, have been more amenable to opening decision-making to public involvement. One EPA official interviewed for this research observed:

> "There's been a lot more guidance since the 1990s and the EPA is more committed to public involvement. There are more extensive community involvement plans and early outreach plans. What we did in early 1990s was cutting edge, but today, at larger sites, it's more status quo. We learned that public participation is beneficial and we've been able to accomplish a lot of things."[411]

EPA has recognized that involving the public early on results in public acceptance, and once the public accepts a particular policy or solution, it is easier to implement. If the government selects a policy or solution without public acceptance, a community is more

[409] Susan Webb Yackee, "Assessing Regulatory Participation by Health Professionals: A Study of State Health Rulemaking," *Public Administration Review*, Volume 73, Issue s1, pages S105–S114, September/October 2013.
[410] Interview with author.
[411] Interview with author.

likely to respond negatively and fight the decision. While some local DOE sites have internalized this lesson, it has not been broadly embraced at agency headquarters. As the case studies showed, the agency tends to respond only under intense pressure and litigation. As Jay Coghlan pointed out in an interview, "Litigation has a remarkable way of clearing out the bullshit. DOE takes litigation seriously. I have doubts that they take anything else truly seriously."[412]

While environmental laws and amendments passed by Congress significantly opened DOE processes to external oversight and public comment, experts and community groups criticize the shortcomings of legal and political processes for failing to provide more significant public involvement opportunities in decisions, even though such involvement has produced better policy outcomes when it has been employed. As one public participation practitioner and technical consultant to DOE commented in an interview:

> I used to think that NEPA was the best thing to happen to public participation, but it might be worst thing. Public participation requires flexible and nuanced approaches to understand what makes sense at a given site. No two projects are the same and you can't predict what is going to happen in a given process. You need to adapt and amend because you're dealing with people. The laws are so prescriptive; they allow agencies to simply check the box in most situations. The laws don't require much participation; what they require are comments on a decision that has already been made. What is needed instead of the check-the-box approach is to engage the public early and consistently throughout the decision-making process. The public should be able to shape solutions and remedies, not just criticize them.[413]

Indeed interviews with community groups revealed that at most sites, though not all, DOE and regulatory agencies tend to pursue the "check the box" approach to participation. While adhering to legal mandates to provide opportunities for the public

[412] Interview with author.
[413] Interview with author.

during formal hearings or comment periods, federal and state agencies do not always pursue the kinds of early and ongoing involvement opportunities that lead to greater legitimacy of decisions, increased trust in institutions and better policy outcomes, as was the case in the study of Fernald discussed in chapter four and has been demonstrated in other environmental policy areas.[414]

A 2014 study of the Environmental Impact Assessment process concluded that while residents use nontechnical language, administrators use technical language and focus on justifying decisions already made, rather than altering decisions based on public feedback.[415] Interviews and assessments of public records for this research similarly found that with regards to the majority of DOE sites and programs, administrators focus on justifying pre-formed decisions and that administrators focus on technical issues. However, this research has also added to the understanding of participation in the Environmental Impact Assessment process by showing how community-based interest groups develop technical expertise to engage with administrators. For example, one observer noted in an interview that is has been remarkable the way that leaders of community groups have mastered technical information and engaged with DOE officials and contractors on their level. The focus on scientific and technical issues has given community groups greater legitimacy. One of the more significant functions of the groups is their ability to translate technical issues and distribute information in order to educate communities and mobilize informed participation so that "ordinary" individuals can be more effective in commenting and participating in hearings on DOE sites and

[414] Thomas Beierle and J. Cayford, *Democracy in Practice: Public Participation in Environmental Decisions* (Washington, DC: Resources for the Future, 2002).
[415] Adam Eckerd, "Citizen Language and Administrative Response Participation in Environmental Impact Assessment," *Administration and Society*, 0095399714548272, August 28, 2014, http://aas.sagepub.com/content/early/2014/08/27/0095399714548272.abstract.

programs. In so doing, community-based grassroots groups have been successful in using the process to alter, delay or even stop specific programs. However, others pointed out that the increased focus over time by community groups on technical issues and specific regulatory processes have been at the expense of greater social movement and capacity building. As they have had to keep focus on day-to-day issues, organizations have less time to make connections to other social and environmental movements.

As part of the interview process, I inquired about the role of citizen advisory boards (CABs) in providing more meaningful public participation. In early 1990s, the Alliance for Nuclear Accountability and its member groups actively lobbied for the DOE to establish citizen advisory boards (CABs) as a means of supplementing other legally mandated public participation opportunities. DOE formally established CABs (also called Site Specific Advisory Boards) as part of its Environmental Management program in 1994 after unrelenting pressure from Congress, state and federal environmental agencies and grassroots protest and litigation. It should be noted that the idea of advisory boards to promote more open agency decision-making was first established as an important feature of President Lyndon B. Johnson's Great Society social programs, though they did not work as well as they were intended.[416] The idea reemerged with the environmental movement. Following the so-called Keystone Committee process, led by EPA and DOE under the Federal Advisory Committee Act (FACA), to determine how to address the growing demand for public participation in environmental remediation and waste

[416] Daniel P. Moynihan, *Maximum Feasible Understanding: Community Action in the War on Poverty* (New York: The Free Press, 1969).

management decision-making, DOE established CABs at major nuclear weapons sites.[417] The objective of the CABs was to enhance public participation and accountability, as well as to provide a forum to share information and develop partnerships among communities, sites, and regulators. In general, the CABs have had important lessons for DOE about how to be proactive and engage in public participation, and they have formalized a process for holding public meeting and distributing materials.

Interviews of individuals at nuclear weapons sites across the country revealed that the effectiveness of CABs varies greatly. At Fernald, the community pressed for a citizen's task force that gave the community an equal voice in decisions. The task force was highly successful because it had strong leadership, strong commitment from DOE and its contractor to include the public, and strong community representation. Although time intensive, meetings were held on the weekends or evenings to ensure that community members could participate. After the major decisions about remediation were made, the task force was converted to a CAB that continued to be effective. Similarly, groups reported that Hanford Advisory Board has been effective in ensuring that community interests are taken into account in decisions and in ensuring a broadly accepted vision for "cleanup" at the site. Community groups at the Rocky Flats site in Colorado noted that the CAB there was initially one of the most effective advisory boards in the country. CAB members represented a wide range of community interests, including academia, Rocky Flats neighbors, business, Rocky Flats workers, local governments, environmental and peace groups, and technical specialists. The group made decisions by consensus, which allowed for greater debate over the range of solutions and

[417] *The Final Report of the Federal Facilities Environmental Restoration Dialogue Committee: Consensus Precipices And Recommendations for Improving Federal Facilities Cleanup* (Washington, DC: 1996), http://www.epa.gov/fedfac/fferdc.htm.

recommendations the board made to DOE. However, as the site got deeper into remediation, DOE marginalized the CAB and created a coalition of local governments that made decisions by majority vote and was more compatible with DOE's preferred options. With Rocky Flats as one of many issues to address, the local governments didn't have the same time or impetus as CAB members to really question or dig into the complicated issues of the site. As a result, cheaper options for remediation were implemented and the standards adopted were not the public's preference. Still, observers noted that "cleanup was a little bit better because of the CAB."[418]

At other major DOE sites, including Oak Ridge, Idaho, Los Alamos and Savannah River Site, many community groups and even some CAB members reported that CABs serve no more than a public relations function for DOE, though they can be useful for getting information that the public or community groups might not be able to obtain otherwise. People who serve on these boards or have the ability to attend the board meetings noted that they do get quite a bit of information from DOE. One individual who at the time of the interview was serving on the Savannah River Site board noted that to be effective on these boards individuals have to have an inquisitive attitude otherwise "you're just not going to get from the government what you want to know." The individual, who is African American, observed:

> "I have learned a tremendous amount I couldn't have imagined. The activities that are going on are really frightening and threatening because we're making that material out there. We're trying to ship it out. But there's no way we can clean up the mess. The technology to clean up the materials are far removed from what it has become. It's a doomed area. I recently told a young man with a black family, if I knew then what I know now, I would pack my family up and move out. There's no future."[419]

[418] Interview with author.
[419] Interview with author.

Although they can serve an information function, CABs around major sites where communities are economically dependent on the sites fall far short in terms of the real public involvement and accountability functions that they were intended to serve. Where there are no good local employment alternatives, continuing nuclear weapons programs, not remediation, are the primary source of jobs. At these sites, environmental concerns must be addressed mainly to secure ongoing nuclear missions.

The CABs have not replaced other forms public participation and overall they have opened access to the agency in ways that did not exist previously. As one interviewee noted, "it is better to have the CABs, than not."[420] However, there is quite a bit of skepticism about the DOE's influence over the agendas and activities of a majority of the boards, which can limit their effectiveness, according to those concerned.

As the case studies in this research demonstrated, some community groups have also developed novel means for public involvement that go beyond legally mandated requirements, such as site tours, and regular meetings and information exchanges with agencies. Interviews with state and federal regulators, as well as with grassroots community groups demonstrated that pre-process informal consultation and public involvement opportunities can be as effective, if not more effective, than legally mandated public participation mechanisms. However, these innovative opportunities require a significant investment of time and resources, as well as constant pressure to be included. At sites where community organizations are volunteer-based or lack resources, or at sites where communities aren't organized, it's much easier for government entities and contractors to discard pressures for public inclusion. Essentially the situation is such

[420] Interview with author.

that the burden of pressing for inclusion is on the public and community interest groups, not on DOE or regulators.

One of the barriers to greater public inclusion is the continued skepticism on behalf of DOE, but especially its contractors, and to some extent even regulators that members of the public can develop expertise to provide informed input in the decision-making process. As this research demonstrated, however, "ordinary" individuals can develop expertise and make substantive contributions to the decision-making process. Community groups comprised of "ordinary" individuals have played a vital role in helping to create an informed public. Furthermore, in cases where DOE, contractors and regulators have committed to providing information and involving the public, ordinary individuals have risen to the challenge of learning complex and technical information to make informed decisions.

At the same time, there has been an overall decline over time in public attentiveness, especially without ongoing media attention to the issues even though so many problems remain. As recent research in other areas has shown, a large volume of negatively-valenced and arousing emotional coverage can drive public attentiveness to political issues. Such was the case discussed in chapter three regarding coverage of nuclear issues in the late 1980s when the media was a collaborator with grassroots community groups in shaping popular perceptions about the issues, which mobilized communities. National and international media were especially useful in drawing attention to the extent of environmental contamination and the risks to health posed

nuclear weapons sites.[421] Through the media, affected communities related personal stories that had emotional appeal. Since the early 2000s, however, with a few exceptions, sustaining media attention has been a huge challenge. The issues are no longer new and the media has moved on to other stories. Issues have also shifted from being more visceral to more technical and policy centered. As cleanup issues have become more cerebral, they have become harder to cover and harder to get covered. There are times when groups are more effective at garnering media attention, usually when there is a major issue at a site.

It has also become more difficult for grassroots groups to garner attention from the public as the political debate has shifted from whether the government needs to redress environmental contamination and threats to health to whether the right things are being done. Since the 2000s, grassroots groups have mobilized periodic bursts of participation around permitting or environmental impact assessment processes, but it is much more difficult to get the public to participate in technical discussions. Furthermore, the scientific and complex nature of the issues and the forums for decision-making to which the public has access require a level of attention and participation that not all individuals have the time or resources to contribute. As such, the role of community groups as a representational force in agency decision-making, especially at the local level, is made even more important.

Another key challenge that has emerged is that very few members of Congress have been willing to take on issues related to remediating the nuclear weapons complex and holding DOE accountable for the health and environmental legacy of the nuclear

[421] Michael Gruszczynski, Emotion and Public Attention to Political Issues, Dissertation Presented to the Faculty and Graduate College at the University of Nebraska, April 2013, http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1024&context=poliscitheses.

weapons complex since the late 1980s and early 1990s. As discussed in this research, Senator John Glenn of Ohio, who was chairman of the Senate Committee on Government Affairs beginning in 1987, was a notable champion. He insisted that the DOE be subject, like most private companies, to environmental and public health laws. According to Robert Alvarez, Senator Glenn "was not cynical, but genuinely concerned about the issue and didn't take it on as an issue for political gain."[422] Oklahoma Representative Mike Synar, chairman of the Subcommittee on Environment, Energy and Natural Resources of the House Committee on Government Operations, also led key House investigations into DOE abuses in the 1980s. A few other members of Congress have been willing to question and call DOE to account from time to time, including Representatives John Dingle (D-MI) and David Hobson (R-OH), and Oregon Senator Ron Wyden. However, since Senator Glenn's retirement, there has not been consistent Congressional oversight, investigation or leadership to call for accountability of the DOE's environmental management program. For the most part, Congress only pays attention to the issues when brought to their attention by interest groups or the press. Other than brief flurries of activity when issues become headlines, Congress falls into habits of inattention. A description in 1988 by one Congressional aide about the problem of inattention remains just as relevant nearly thirty years later: "When the tough job of cleaning up the weapons' facilities is no longer on the front page, you'll be able to count on one hand how many Senators are going to spend the rest of their careers on the thankless job of trying to clean up the mess."[423]

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[422] Interview with author.

[423] Kenneth B. Noble, "The Nation: The Responsibility Issue; After 40 Years, the Silence is Broken on a Troubled Nuclear Arms Industry," *New York Times*, October 16, 1988,

No member of Congress has stepped up to the oversight plate in the same way that Senator Glenn and others did in the 1980s. According to Bob Alvarez, "There has been such a change in Congress itself that there is very little appetite or interest from the members who head the oversight committees. Congress just doesn't conduct hearings and investigations into the DOE in the same way that it used to. When Senator Glenn left, it went with him. And the people responsible for the budgets don't have the time to do necessary oversight. There has not really been a curious appetite within the executive or Congress since Senator Glenn left."[424] Another independent analyst observed that because the DOE's environmental management program is funded under defense committees, it is just pennies in comparison to other defense programs, even though it is much greater than the Superfund program.[425] In addition, because the complexity and scope of the problems can be confounding, members of Congress have very little incentive or desire to expend political capital to address the issues. Furthermore, the nature of the problems today requires a different level of oversight and investigation. In addition, because the media is also not focused on scrutinizing DOE in the same way it has in the past, Congress has less of an incentive to question DOE policies and practices.

Future research

Because their role in regulatory politics is understudied, this research focused on community-based grassroots groups. However, national interest groups, especially the Natural Resource Defense Council, have played an important role in opening up the nuclear weapons complex to greater oversight and public participation. As one of the

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http://www.nytimes.com/1988/10/16/weekinreview/nation-responsibility-issue-after-40-years-silence-broken-troubled-nuclear-arms.html?pagewanted=print.

[424] Interview with author.

[425] Interview with author.

interviewees commented, the NRDC was essentially the litigating arm of the movement in the 1980s and 1990s. In turn, the community groups studied in this research provided a grassroots constituency for NRDC's work. Future research could examine NRDC's role and contributions over time, as well as the interplay between national and grassroots organizations.

This research has repeatedly raised the problems and challenges that emanate from the fact that contractors do the actual environmental remediation work, not DOE employees. A future study could use the DOE and EPA as case studies to examine the rise of the contracting state and its implications for administrative governance. Findings from such research might recast the efficacy of the competing views of democratic governance – administrative expertise, pluralism or popular governance – since contractors are not subject to the same transparency and public accountability and participation requirements as government entities.

Chapter two of this research found that the struggle to open regulatory processes to greater state authority in this issue area led to antagonist federalism in the 1980s. However, as the case studies at specific sites demonstrated, there has been more collaboration between state and federal agencies as remediation efforts ensued. Future research might examine the rise and role of states in asserting authority over environmental regulation over time and implications for federalism. Research on the role of states might also provide a more in-depth comparison of state regulatory structures and analysis of how different states have employed their regulatory authority. Such research could contribute a better understand of the dynamics between federal and state administrative agencies, as well as contribute to a better understanding of public

participation in state regulatory processes. Future research in this area could also examine how states have formed alliances, especially through the National Governors' Association Federal Facilities Task Force, and coordinated efforts to address environmental pollution and health issues emanating from the nuclear weapons complex.

Future research could also provide a more in-depth examination of presidential initiatives for greater openness and public participation in environmental decisions at nuclear weapons complex sites, especially the Openness Initiative in the Clinton Administration. Such research would contribute to a greater understanding of the ability of presidents to influence and impact bureaucratic agency policy, programs and culture.

Finally, the United States is just one of nine countries that have developed and possess nuclear weapons. As bad as the contamination is in the United States, at least there are institutions and political processes through which the polity can get information, hold the government to account and even participate in decisions. Other countries with nuclear weapons do not have any such democratic accountability. Even worse, some states that were territories of nuclear weapons states during the Cold War, namely the Marshall Islands, French Polynesia and Algeria, among others, were used as proving grounds for nuclear weapons programs. Their environments were contaminated and the health of their peoples was put at risk, both intentionally and accidentally. Future research could examine the linkages between the movements for health and environmental redress across countries. For example, my own professional experience and that of interviewees suggests that the efforts of interest groups in the United States have inspired and empowered atomic veterans and interest groups in other countries to call for openness, accountability and redress. As affected communities and atomic

workers have spoken out in the United States, it has inspired individuals in other countries to break the nuclear taboo and speak out about health and environmental problems. Groups across countries have also developed networks and shared strategies. For example, the Alliance for Nuclear Accountability helped Russian allies organize their first "Moscow Days" in 2000 to allow local activists to pressure their government officials.

Bleak But Not Hopeless

While some scholars have bemoaned the decay of American politics and decline in democratic participation, this study has found that there is indeed sustained and informed grassroots participation in regulatory decision and policymaking processes. Furthermore, these groups have played an active role in expanding public involvement opportunities and mobilizing public participation. Even if it falls short of participatory ideals, communities are demanding a say in regulatory politics, and not just relegating decisions to administrators, contractors, experts, or national interest groups.

Although the political and technical challenges to address the health and environmental legacy of nuclear weapons may seem overwhelming, they are not insurmountable. Community-based grassroots groups who daily encounter political realities and who perhaps best understand the nature and extent of health and environmental problems should be some source of inspiration. As Jay Coghlan of Nuclear Watch New Mexico said in an interview, "Democracy is a muscle, use it or lose it. Get over your cynicism. The influence of big money can be counteracted by showing up. It's a tough job. Get off your ass and do something."[426]

[426] Interview with author.

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