

**SANDIA AND THE WASTE ISOLATION PILOT PLANT,
1974-1999**

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Before getting into my specific subject, I'd like to paraphrase Thomas Hughes from his book, *Rescuing Prometheus*. We have learned to design and build big projects, which certainly describes the WIPP project, but also includes defense projects, highway networks, space exploration, the Internet, etc., through what Hughes calls "a messily complex embracing of contradictions." When something massive and complicated has to be built these days, it leads to a protracted political process in which every special interest makes a stand, lobbyists exert what influence they can, lawmakers bicker, contractors change things, Congress struggles with costs, environmentalists hold things up—and this is good. It may seem amazing that anything gets done, but when it does, everyone has had their say. It's an intensely democratic, even if expensive and time-consuming, process.

Well, that certainly describes the 25-year-long Waste Isolation Pilot Plant, or WIPP, project. First, a little background since I assume that most of you are not too familiar with WIPP or with Sandia National Laboratories in Albuquerque, New Mexico, of which I am corporate historian.

The WIPP is a unique facility in the world. It is the only specially designed and mined repository consisting of some 7 miles of

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underground tunnels 2150 feet below the surface. These tunnels are for the disposal of low-level plutonium radioactive waste created in the manufacture of nuclear weapons. They have been mined in bedded salt beds, the remains of an ocean that evaporated some 250 million years ago. The fact they're still there shows that the formation is very stable and has not been subjected to any significant underground water flow. It is this stability that makes it suitable for a repository, since the salt will most probably remain undisturbed for at least 10,000 years. The WIPP also has surface facilities: a waste-handling building to receive the shipments, process them, and prepare them for underground disposal. Also other buildings containing a visitor center, offices, maintenance, and security. The waste, packed in steel drums, is placed in underground salt chambers where eventually the salt will "creep" to fill the open space, entombing the waste drums.

Sandia Laboratories was an offshoot of Los Alamos Laboratory, in northern New Mexico, where the first two atomic bombs were designed and built. It was established in 1945 as the ordnance engineering and field test support arm of Los Alamos in the nuclear buildup days following the Manhattan Project—in short, Sandia was responsible for the nuts and bolts needs of the U.S. nuclear arsenal. Its core mission was to support the nuclear design laboratories—Los Alamos and, after 1956, Lawrence Livermore Laboratory in California—by converting their nuclear designs into increasingly safer, more secure, more compact, and more reliable weapons.

Sandia came into being concurrently with the beginnings of the Cold War. It was originally Z division of Los Alamos, the engineering and field testing group, which was established in 1945 at Sandia Base, an Army Air Corps installation near Albuquerque, some 100 miles south of Los Alamos. In 1949, the Atomic Energy Commission asked AT&T to assume

management of the Labs, which it did until 1992 when Martin Marietta (now Lockheed Martin) became the manager. From this small engineering support group formed in the waning days of World War II, Sandia grew impressively as international tensions increased in the 1950s and 1960s. By the 1970s, it employed some 7000 people in its main facility in Albuquerque, and another 1000 in Livermore, California. It also operated test ranges in Tonopah, Nevada, and Kauai, Hawaii.

Well, that's enough background on Sandia Labs. Now I want to briefly relate how Sandia was selected as the principal scientific advisor to the WIPP project. But before I do that I need to give you some background on the whole messy business of waste management, which is a bureaucratic way of describing the disposal of radioactive waste products.

Radioactive waste was initially generated during the building of the first atomic bombs in Los Alamos from 1943 to 1945. Robert Oppenheimer, the legendary first director of Los Alamos, considered waste management to be unimportant, and the radwaste and toxic materials were simply dumped into adjacent canyons. This attitude was pervasive throughout the Manhattan Engineer District, and continued in the postwar period under the Atomic Energy Commission (created by the Atomic Energy Act of 1946). Basically, this cavalier attitude toward safe disposal of radioactive waste was driven by the secrecy and national security concerns surrounding the design and manufacture of nuclear weapons. Without public scrutiny of their operations, the nuclear weapons facilities could pretty well do what they pleased. Then they moved to storing high-level waste as liquids in tanks and burying other waste in trenches until such time that a more permanent method of disposal could be found. For fifty years they did this and no permanent waste disposal method was developed. And now, especially at the Hanford

Plant in the state of Washington, the buried radioactive wastes are contaminating the water table.

In the early 1970s, the AEC had Oak Ridge Laboratory study some abandoned salt mines near Lyons, Kansas as a possible repository for transuranic, also called TRU, waste. But Kansas politicians and citizens groups became nervous over the possibility of water leakage from nearby mines, and the project became a big political issue, necessitating its abandonment. So then the US Geological Survey looked at southeastern New Mexico in an area called Los Medanos which is located in the north-central part of the Delaware Basin, an 8,920-square-mile region extending from southeastern New Mexico to western Texas. Here, evaporation in a shallow sea deposited over 3600 feet of evaporites (salt) during the Permian period between 286 and 245 million years ago.

In 1974, Oak Ridge and USGS scientists drilled two exploratory wells and on the basis of core samples declared the site to be suitable for development of a repository. By the end of 1974 and early 1975, when the AEC became ERDA (Environmental Research and Development Administration), it was decided to have Sandia take over the scientific studies of the site. When Sandia scientists drilled another exploratory well, they discovered that the underground salt beds dipped sharply, almost vertically, rendering the Oak Ridge-approved site unsuitable. Besides the drillhole released toxic gas and brine, almost killing a worker. This caused a great deal of consternation at ERDA Hq in Washington, D.C. In an interview, one Sandian recalled:

The furor that this discovery caused at headquarters in Washington could almost be heard without using a telephone because the reaction from one of the project people in charge was, "What are you trying to do, kill the site? What do you mean drilling a hole and discovering gas and brine?"

This shows the value of oral history, because generally you just can't get this kind of insight from official documents, although I did find several instances of irascibility in letters and meeting minutes. But some DOE officials who reviewed the document were still uncomfortable with publishing exchanges like the above.

The WIPP is designed for the disposal of transuranic waste: plutonium-contaminated materials used in the manufacture of nuclear weapons, also called defense waste. This waste consists primarily of protective clothing, rags, tools, equipment and other industrial trash, byproducts of nuclear weapons production. This radioactive waste was temporarily stored at Department of Energy sites like Los Alamos National Laboratory, Idaho National Engineering Laboratory, and Rocky Flats outside Denver, Colorado.

Initial studies at the proposed WIPP site began in 1974; construction was completed in 1990, and the site was authorized to start receiving waste on March 26, 1999, when the first shipments arrived from Los Alamos. The years in between were filled with lawsuits from environmental and anti-nuclear organizations, conflicts between the state of New Mexico and DOE, and in general a very public debate about the pros and cons of WIPP, really the first time that the DOE (AEC until 1974; ERDA—Environmental Research and Development Administration, from 1974 to 1979, and DOE to the present). The principal responsibility of these agencies was nuclear weapons research, design, and fabrication. A highly secret activity fueled by Cold War concerns and ideology. So the WIPP debate was something very new and often disconcerting for both the Feds and Sandia—in which they were under intense public scrutiny from the beginning and required to explain and justify their decisions to the public.

I hope that's enough background on the WIPP project, which you'll gather has been a very complex and long-lasting one. Certainly for Sandia it has been its most public and controversial project.

I became Sandia's corporate historian in 1996. About a year later, I began researching this project. Wendell Weart, the Sandia scientist who led the scientific investigations for almost the entire 25 years wanted to have a history of the project that emphasized the role of the individuals involved. And I needed a project and his funding. So I began gathering research materials in 1996.

Fortunately, Sandia's WIPP project from the beginning meticulously saved every memorandum, report, and correspondence of which there are voluminous amounts. In a couple dozen file boxes. This was required to document the technical decisions in the event they should ever be challenged in the courts. But it was serendipitous for me because I had a large quantity of archival materials to consult for my history. This is unusual in Sandia projects, because much of the documentation for weapons programs is in the form of technical reports, which don't really tell much about the people involved in projects and how decisions were made. Besides, much of the documentation for weapons work was and remains classified.

WIPP, being unclassified and subject to intense public scrutiny, provided a wealth of printed documents, from Sandia files to extensive newspaper clippings. The *Albuquerque Journal* closely followed the story from 1974 to the opening of WIPP in 1999, and it provides an invaluable record of the ups and downs of the project, including the political battles among the federal government, state officials, watchdog groups, and concerned citizens. It also revealed a fascinating regional/cultural conflict, I might call it, between northern and southeastern New Mexico. Again, the

official records rarely allude to this, but the newspaper accounts certainly do, as well as the personal recollections of the participants.

Returning to the regional/cultural conflict I alluded to, it involved Carlsbad, the city in southeastern New Mexico that was anticipating a profitable relationship with WIPP. The traditional industry in the area was potash mining and oil and natural gas drilling. Nearby Carlsbad caverns is also a source of tourist dollars. In the early 1970s, potash mining in the US had practically collapsed from foreign competition. Unemployment in the Carlsbad area was high and the town was facing an economic crisis. The city fathers, when they heard that the AEC was interested in studying the Los Medanos area (means "sand dunes" in Spanish) about 25 miles east of the city for a radioactive waste repository, began aggressively lobbying both the AEC and the New Mexico state government to locate the repository in their area. Most of the opposition to the WIPP project was centered in Albuquerque and the state capital, Santa Fe. The self-styled "City Different" in recent years has become a trendy place, especially for Hollywood types and other creative people. Since the 1920s, it has attracted artists from other parts of the country, and even from abroad, like D.H. Lawrence. It is now also a New Age energy center.

Anyway, the great fear among some Santa Fe residents is that the WIPP trucks from Los Alamos would have to pass through the city, and an accident could occur which would release dangerous levels of radioactivity in the city. DOE officials and Sandia scientists pointed out that the TRUPACTs (stands for Transuranic PACKaging Transporter), the containers specially designed to carry the transuranic waste, had been thoroughly tested and could withstand any foreseeable accident. And the type of waste carried in the TRUPACT container in 14 55-gallon steel drums—clothing, tools, etc.—could certainly not go critical and explode,

as some of the more emotional and uninformed people in Santa Fe feared. But the DOE and its predecessor agencies did not have a shining record of truthfulness in many other issues dealing with nuclear safety (Hanford, Rocky Flats, Los Alamos) through the years, which did not help their credibility in this instance.

In 1989, the DOE published a draft supplemental Environmental Impact Statement, and held public meetings in Albuquerque and Santa Fe to listen to reactions, which generally turned into angry denunciations of DOE and WIPP. When the hearings moved to Santa Fe the scene resembled a street festival where a stream of dancers, singers, poets, and storytellers took center stage. Where 80 people had testified in Albuquerque, 545 showed up in Santa Fe. John Arthur, one of the DOE officials, stoically said: "I'm glad we're doing this because we've gotten some really good public comments. I enjoy this. I know that sounds masochistic." This after protestors had compared him to Darth Vader and the DOE to the Chinese People's Republic. Virtually the only support for WIPP came from about 30 Carlsbad residents, who said they were spat upon as they entered the hearing.

And finally I get to the oral history part. The only way to capture much of the personalized history of such a project is by interviewing the people involved in it. And I think that these accounts certainly spice up my history. At a distance of over twenty years, many of the oldtimers still retain detailed memories of incidents and conversations, as well as lingering resentments against the AEC, ERDA, and DOE, as well as other individuals within and outside Sandia. And I did this history at just the crucial time, because many of the early project people are retired and a number have passed away. Some are still working at Sandia, most significantly Wendell Weart, who was my prime informant for the study.

For my oral history sources, I used about 30 informants. Some were one-on-one audiotaped interviews, but most were videotaped discussion panels, presided over by Wendell Weart. Of the latter, I have some 20 hours of often rambling discussions. But I did extract significant quotes, after many hours of listening. Here's an example of an original statement which I quoted in the book, from George Griswold, one of the more colorful informants. He was a geologist employed by Sandia in the middle 1970s:

PLAY GRISWOLD VIDEOTAPE

ABC TV REPORT

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy under contract DE-AC04-94AL85000.