

# NEW MEXICO

## Los Alamos National Laboratory, Sandia National Laboratories, the Waste Isolation Pilot Plant

### Background

New Mexico hosts three major U.S. Department of Energy (DOE) sites: Los Alamos National Laboratory, Sandia National Laboratories and the Waste Isolation Pilot Plant (WIPP).

Los Alamos National Laboratory, located 25 miles northwest of Santa Fe, was established in 1942 to develop the first atomic bomb. It still serves as a key center for weapons and basic science research. The site spans more than 40 square miles and is dissected by canyons several hundred feet deep that drain into the Rio Grande River. The regional aquifer beneath the plateau is the sole water supply for the laboratory and the communities of Los Alamos and White Rock.<sup>82</sup>

Sandia National Laboratories began operating in 1945 on Sandia Base in Albuquerque to support Los Alamos National Laboratory's efforts to build the first atomic bomb. Sandia National Laboratories is located within Kirtland Air Force Base and shares its northern boundary with the city of Albuquerque. The regional aquifer in the Albuquerque Basin serves the nearly 1 million people who live in Albuquerque and its surrounding communities. Like Los Alamos National Laboratory, Sandia National Laboratories has contributed to groundwater contamination of its regional aquifer, with at least four groundwater plumes identified.<sup>83</sup>

WIPP, located 26 miles east of Carlsbad, was authorized by Congress in 1979 as the nation's first (and remains the only) underground repository for the permanent disposal of the nation's defense-related transuranic waste (Figure 13).<sup>84</sup> WIPP is operated under a repository certification from the U.S. Environmental Protection Agency and a hazardous waste facility permit issued by the New Mexico Environment Department. The latter document requires that DOE EM use robust characterization procedures at each generator site across the complex before WIPP can receive waste.<sup>85</sup> DOE EM requires strict compliance with the waste analysis plan and waste acceptance criteria in the WIPP permit.



**FIGURE 13:** TRU waste shipment to WIPP. Photo courtesy of U.S. Department of Energy.

<sup>82</sup> Los Alamos National Laboratory. (n.d.). Our history. Retrieved from <https://www.lanl.gov/about/history-innovation/>.

<sup>83</sup> Sandia National Laboratories. (2019). History. Retrieved from <https://www.sandia.gov/about/history/index.html>.

<sup>84</sup> Waste Isolation Pilot Plant. (n.d.). History. Retrieved from <https://wipp.energy.gov/history/timeline.asp>.

<sup>85</sup> New Mexico Environment Department. Hazardous Waste Bureau: WIPP. Retrieved from <https://www.env.nm.gov/hazardous-waste/wipp/>.

## Major Accomplishments

In New Mexico, WIPP, Los Alamos National Laboratory and Sandia National Laboratories have all had recent successes:

- **WIPP/Los Alamos National Laboratory:** In January 2016, the New Mexico Environment Department and DOE signed a settlement agreement and stipulated final order to address the 2014 events. They agreed to:
  - An enhanced waste characterization review and process.
  - Enhanced facility maintenance and site emergency response.
  - Funding of various supplemental environmental projects.
- **WIPP Reopening and More Stringent Reviews:** After being shut down for almost three years following the radiation leak of 2014, the New Mexico Environment Department, under the leadership of Gov. Susana Martinez, held a facility-wide inspection in late 2016 to clear the way for WIPP to resume operations. Part of this inspection was to verify that the enhanced facility emergency response processes and training and the more stringent reviews for waste coming to WIPP required by the settlement agreement and stipulated final order were being implemented.<sup>86</sup> WIPP reopened on Jan. 9, 2017, and has received more than 7,000 containers in over 300 shipments since reopening. DOE EM is currently reviewing options for properly storing more than 400 containers of problematic Los Alamos National Laboratory waste. In addition, DOE EM has submitted several permit modifications for WIPP. The first is a Volume of Record modification that would potentially add 30 percent more storage capacity to the plant.<sup>87</sup>
- **Supplemental Environmental Projects at WIPP and Los Alamos National Laboratory:** The settlement agreement and stipulated final order included the completion of supplemental environmental projects for both the Los Alamos National Laboratory and WIPP.<sup>88</sup> Funding was provided for WIPP for the following projects: road repairs along the WIPP transportation route in southern New Mexico; triennial independent reviews of environmental regulatory compliance and operations at WIPP (the first of which has already been completed); enhanced training for local emergency responders; and the creation of a state-of-the-art emergency operations center in Carlsbad, New Mexico. Projects at the Los Alamos National Laboratory include potable waterline upgrades, watershed enhancement, storm water monitoring, independent reviews of environmental regulatory compliance and operations at Los Alamos National Laboratory, and road projects in the Los Alamos area.
- **Los Alamos National Laboratory Chromium Plume Cleanup:** The New Mexico Environment Department and DOE EM are partnering on the chromium plume cleanup at Los Alamos National Laboratory as part of the settlement agreement signed in 2016.<sup>89</sup> For federal fiscal year 2017, DOE EM completed 15 of the 16 milestones on time;<sup>90</sup> one received an extension by the New Mexico Environment Department because additional characterization of a contaminated water plume was needed.<sup>91</sup> For federal fiscal year 2018, 15 milestones were agreed upon.<sup>92</sup> Extension requests were accepted for one or two milestones because additional work is needed to proceed with the projects. The New Mexico Environment Department and DOE EM are in the annual planning process for federal fiscal year 2019, and 19 milestones have been proposed. DOE EM has successfully completed treatment of all remediated and unremediated nitrate salt-bearing waste

<sup>86</sup> U.S. Department of Energy, Carlsbad Field Office. (2016, June 3). *Class 2 permit modification request. Revise the RCRA Contingency Plan and associated emergency response personnel training and active room ventilation flow rate: Waste Isolation Pilot Plant, Carlsbad, New Mexico* (WIPP Permit No. NM4890139088-TSDF). Retrieved from <https://www.env.nm.gov/wipp/documents/160603.pdf>.

<sup>87</sup> U.S. Department of Energy, Carlsbad Field Office. (2017, December). *Environmental assessment for the above ground storage capacity at the Waste Isolation Pilot Plant* (Report No. DOE/EA-2064). Retrieved from [http://www.sric.org/nuclear/docs/EA\\_AGSC.pdf](http://www.sric.org/nuclear/docs/EA_AGSC.pdf).

<sup>88</sup> U.S. Department of Energy. (2016, January 22). *U.S. Department of Energy and New Mexico finalize \$74M in settlement agreements for nuclear waste incidents of 2014*. Retrieved from <https://www.energy.gov/articles/us-department-energy-and-new-mexico-finalize-74m-settlement-agreements-nuclear-waste>.

<sup>89</sup> New Mexico Environment Department. (2016, January 22). *Settlement agreement and stipulated final order*. Retrieved from [https://www.env.nm.gov/OOTS/documents/LANLSASFO-FINAL1\\_22\\_16.pdf](https://www.env.nm.gov/OOTS/documents/LANLSASFO-FINAL1_22_16.pdf).

<sup>90</sup> New Mexico Environment Department. (2016, June). *Appendix B: Milestones and targets*. Retrieved from <https://www.env.nm.gov/wp-content/uploads/2016/05/Appendix-B-Milestones-and-Targets-June-2016.pdf>.

<sup>91</sup> New Mexico Environment Department. (2017, December 4). *Fiscal year 2017 deliverables accomplishments and fiscal year 2018 deliverables list*. Retrieved from <https://www.env.nm.gov/wp-content/uploads/2016/05/38291.pdf>.

<sup>92</sup> New Mexico Environment Department. (2018). *Appendix B: Milestones and targets*. Retrieved from <https://www.env.nm.gov/wp-content/uploads/2016/05/LANL-CO-APPEN-DIX-B-2018.pdf>.

stored at Los Alamos National Laboratory, which was similar to the waste that caused the 2014 incident at WIPP that resulted from a breach of a stored remediated nitrate salt-bearing waste drum.

- **Sandia National Laboratories:** In the past three years, Sandia National Laboratories has achieved corrective action complete status for 32 solid waste management units and areas of concern, which included industrial septic systems, drain fields, surface impoundments, open dumps, and firing and burn sites. This accomplishment has reduced the overall management of sites from close to 300 sites in the 1990s to six areas requiring corrective action; these six sites are undergoing continuing characterization and remedy efforts.

## Site-Specific Issues

Efforts to modify how the volume of nuclear waste is recorded at WIPP continue. In December 2017, DOE published a modification to WIPP's permit with the New Mexico Environment Department in an attempt to change the way storage is tracked so that air and empty space in the underground storage area is not counted in the storage capacity with the waste.<sup>93</sup> The New Mexico Environment Department approved the permit modification in January 2019.

---

<sup>93</sup> New Mexico Environment Department. (n.d.). WIPP—permit page. Retrieved from <https://www.env.nm.gov/hazardous-waste/wipp-permit-page/>.