

## **Request for Sandia National Laboratories' Mixed Waste Landfill Excavation and Offsite Removal**

Dear Water Protection Advisory Board (WPAB) Members,

Citizen Action New Mexico is a 501(c)(3) project of the New Mexico Community Foundation and began to participate in technical and public proceedings for the Sandia National Laboratories Mixed Waste Landfill beginning in 2000.

This letter calls for an agenda item for the WPAB to request that the New Mexico Environment Department ("NMED") issue an Order, called a Corrective Measures Implementation Plan ("CMI Plan"), for the excavation and offsite disposal of the toxic and radioactive chemicals contained in the Sandia National Laboratories ("Sandia") Mixed Waste Landfill ("MWL"). This course of action by the WPAB and NMED is necessary to protect the long-term public health and safety. The 2016, 2017 and 2020 WPAB Annual Reports consider that the Sandia dump contains a mixture of hundreds of types of toxic chemicals and long-lived radioactive wastes.

**The NM Environment Department Final Orders from 2005 and 2016 required study of the "feasibility of excavation" of the dump with either onsite or offsite waste disposal.** The 5-Year Review for the dump was submitted in January 2019 to the Department. Sandia's 5-Year Review writes that planning and implementation for excavation is feasible and could begin by the NMED issuing an Order for a CMI Plan.

**Sandia now states (Section 5.4) that the preferred alternative is excavation with offsite disposal as a remedy rather than the onsite disposal alternative.** According to the Sandia 5-Year Review: excavation with offsite disposal, as compared to onsite disposal in a new RCRA landfill, presents less cost, less risk to workers and the public, less time, a smaller footprint, less regulatory time and that pathways currently exist offsite for the disposal of all the wastes. Excavation could allow the current site of the dump to become allowable for industrial use. Excavation can be accomplished by conventional and remote controlled robotic equipment. Radionuclides such as Cobalt 60 and Tritium have decayed to levels that are acceptable.

The MWL was formerly called the "Area 3 Radioactive Waste Dump." Technically and legally, the MWL does not qualify with the requirements to be a "landfill" because it lacks liners and leachate extraction beneath its dirt cover and the bottom of the pits and trenches. The installation of a shallow dirt cover above the dump was completed in 2009 under corrective action. but is subject to water penetration horizontally and vertically, human, animal and insect intrusion..

The dump lies approximately one mile from the Mesa del Sol residential development, 5 miles south of the Sunport and north of Isleta Pueblo. The nuclear weapons era wastes disposed of between 1959 to 1988 are leaking from the unlined disposal pits and trenches above Albuquerque's drinking water aquifer.

The 2.6 acre site has a classified (0.6 acres of pits) and unclassified area of trenches. It is unknown fully what are the contents of the secret area. In 1964, a records purge was made for earlier years of the MWL disposal operations. A Resource Conservation and Recovery Act ("RCRA") Facility Investigation did not consider any risk from a possible pathway between the dump and the aquifer below.

For a fifty year period, precipitation entered the pits and open trenches of the dump. 270,000 gallons of reactor waste water containing hexavalent chromium was disposed of in Trench D. Another 5,000 gallons of water was used to extinguish a uranium chip fire in trench B. A second uranium fire also occurred. Protective berms around the MWL were breached by powerful storms in 2006-07 with pooling of water.

A memorandum dated November 20, 1996 from Sandia staff person Mr. Jerry Peace to DOE staff person Mr. John Gould described poor control of water entering the MWL:

"Pit caps in the classified area [of the MWL] are in serious need of repair. Many concrete caps have collapsed under their own weight because they were not formed, reinforced, or finished when poured. Plywood caps need immediate attention because they are rotting and slumping into the pits. These collapsed pit caps act as funnels, channeling precipitation into buried waste. These caps have collapsed because backfilled soils have settled over time, leaving a void directly beneath the concrete or plywood cap." [Emphasis supplied]

The wastes were haphazardly placed in the dump in cardboard boxes, plastic bags, plastic wrapped containers, 55 gal drums and other containers, all subject to breakage and corrosion. Wastes were not sorted according to combustibility, biological content, or radionuclides.

The MWL never received a RCRA (Resource and Conservation Recovery Act) permit. It received hazardous waste after July 26, 1982 and should have been, according to the NMED (Dinwiddie, April 1998), treated as a "regulated unit" with strict ground water monitoring, a closure and a post closure plan. However, Sandia's documents from 1997-98 describe that their strategy was to take a path for "No Further Action" status for the MWL and avoid: the costs of excavation, long term storage, placement in a deep geologic repository and avoiding the obligation for the dump to be on Sandia's Site Treatment Plan. The MWL is currently treated as a Solid Waste Management Unit which is the least protective standard, especially

considering the character of the radioactive and chemical wastes without separation from the aquifer serving Albuquerque's population.

**The dirt cover is unprotective for long-term.** In 2006 a TechLaw, Inc. report (only obtained by Court order in late 2009) described for the Fate and Transport portion of the Long-term Maintenance and Monitoring Plan ("LTMMMP") that the dirt cover could not meet the requirements of 40 CFR 264.301 and 264.310. The **TechLaw, Inc. critique of the dirt cover included:**

- Computer codes and software used for the Fate and Transport Model provided no assurance that further release of contamination would not reach the aquifer.
- It lacked liners. The dirt cover could not meet the requirements of 40 CFR 264.301 for a liner system.
- Cover lacked durability for maintenance free use for the 1,000 year time period (DOE Order 435.1),
- There is the absence of moisture monitoring beneath the cover,
- The lack of a membrane beneath the cover to remove water to the sides of the cover, and
- The lack of leachate detection and collection capability.
- Criticized the neutron tube moisture detection as not providing early warning that water has breached the cover and is moving down through the buried waste. The neutron tubes are placed beneath the buried wastes.
- Criticized "The use of data trends for trigger evaluations" as not being the appropriate legal mechanism "to determining the statistical significance of each exceedance" in collected sampling data .

TechLaw also cited "inadequate accounting for the effects of subsidence in modeling of predicted cover behavior, and lack of consideration of any methods to minimize future settlement." Other TechLaw concerns under General Comments were:

2. Hydraulic conductivity of the cover, bathtub effect
3. Chemical characteristics of the soil to be used as the cover material;
4. Subsurface gas generation venting from the cover design;
5. Potential subsidence of the wastes in the MWL and disruption of the "monolithic" cover. The assumption that the soil cover "...will accommodate differential subsidence ... is a major leap in logic, unsupported by analysis or empirical evidence." "The Closure Plan should be revised to evaluate potential subsidence based on the actual wastes known to be present in the MWL, ... minimizing subsidence, and procedures to reconstruct and repair the monolithic cover layer in response to future subsidence."

According to the NM Environment Department 2016 Final Order, the dirt cover above the dump is not a Resource Conservation and Recovery Act ("RCRA") Subtitle C cover. **The 2016 Final Order indicates that the dirt cover "may not be the most appropriate long-term solution for the [MWL] site:**

While there is no evidence of groundwater contamination at the MWL, the final remedy selected in 2005 (ET cover with biointrusion barrier) may not be the most appropriate long-term solution for this site. Absent complete excavation and off-site disposal, installation of a RCRA Subtitle C liner system would be the most protective, modern design for a mixed waste landfill.

**According to the Environmental Protection Agency (EPA), all landfills will leak.** The MWL dirt cover cannot protect the public and environment for the lengthy half-lives of the radionuclides in the MWL and **volatile organic chemicals and semi-volatile organic compounds** and included Perchloroethylene (PCE) and Tetrachloroethylene (TCE) carbon tetrachloride, organic acids, scintillation cocktails (toluene based) believed to also contain radioactive waste. PCE and TCE are already diffusing 400 ft into soil beneath the dump near to or entering groundwater. TCE was dumped in 1 cu. ft. amounts (7.5 gal). Two-hundred and fifty-one cu. yd. of Polychlorinated biphenyls ("PCBs") are in the dump and require, but do not have, an EPA Toxic Substances Control Act ("TSCA") permit for disposal. These solvents alone are capable of contaminating hundreds of millions of gallons of water.

According to a Sandia Site Health and Safety Plan Form 92-27, Sandia was disposing of liquid waste in the MWL until 1975. Other landfills and areas at Sandia have contaminated the groundwater -- such as the Chemical Waste Landfill, the Lurance Canyon Burn Site, Tijeras Arroyo Groundwater, and Technical Area 5. (Not to mention the jet fuel/aviation gas spill at Kirtland Air Force Base.)

Tons of heavy metals were disposed of in the MWL such as lead, cadmium, nickel, beryllium, uranium. Incompatible, potentially explosive lead azide, lithium and metallic sodium were disposed.

The dirt cover placed above the dump cannot remain protective of the public considering the **long-term danger of 71 cu yd. of Transuranic waste ("TRU")** that legally requires deep geologic disposal due to lengthy half-lives. 10 CFR § 61.55(a)(2)(iv). Such long-lasting radionuclides include: Plutonium-239 (half-life 24,000 years), Neptunium-237 (half-life 2,000,000 years), Uranium-235 (half-life 704,000,000 years), Technetium-99 (half-life 211,000 years), and Americium-241 (half-life 432.7 years). There are 119 55 gal drums of plutonium laced waste from Lovelace Laboratory. DOE Order 435.1 includes in its definition of HLW "other highly radioactive material that requires permanent isolation."

Although the dump has been claimed to only contain low-level mixed radioactive waste, disposal records show the **presence of High Level Waste**. Among the 6,000+ Radioactive and Toxic Disposal sheets for the MWL (obtained under the FOIA) are sheets that indicate disposal of irradiated fuel pins (also referred to as “rod” or “fuel element ends”) and toxic chemicals from nuclear reactor meltdown tests, testing of fuel for a nuclear rocket program (Space Nuclear Auxiliary Program or “SNAP”), military testing and disposal from nuclear weapons testing at the Nevada Test Site, Kwajalein Island and White Sands. Disposal records show radioactive wastes from nuclear weapon tests with names such as: Fin Foot, Diesel Train, Mighty Epic, Camphor, Cypress, Ming Blade, Hudson Moon, Hudson Seal, Midi Mist, Bagpipe, Chardonnay, Minute Stools, Diana Mist, Mint Leaf, Misty North, Husky Pup, Husky Ace, Dido Queen and Diamond Skulls.

Internal Sandia memoranda indicate the disposal of “packages” of metallic sodium and canisters containing metallic sodium mixed with melted irradiated fuel pins. Four such canisters were disposed of in pits 35 and 36 and other canisters were disposed of in unknown locations drilled in vertical small diameter holes in the bottom of trenches. There was a metallic sodium/uranium loading facility for nuclear reactor meltdown experiments. The 1984 Excess Special Nuclear Materials (list 15c) stated: "However, I believe it is no longer possible to bury packages of metallic sodium [in the MWL].(Hence, we are between a rock and a hard place.)" Corroded containers with metallic sodium at a Beatty Nevada waste dump, similar to the MWL, exploded in October 2015 during a heavy rain storm, sending a radioactive waste cloud over four states.

<https://www.youtube.com/watch?v=8VHylGDOvwU>

**The defective MWL groundwater monitoring network data did not justify leaving radioactive and toxic wastes in place at the MWL as a final remedy.** The USEPA Inspector General issued a Hotline Report on April 14, 2010 entitled *Region 6 Needs to Improve Oversight Practices* <https://www.epa.gov/sites/production/files/2015-10/documents/20100414-10-p-0100.pdf>. EPA Inspector General Interviews of Region 6 technical staff (obtained by a FOIA lawsuit) for the Hotline Report indicated that the team’s initial analysis of the MWL groundwater monitoring network would not have supported the “solution” [of a dirt cover].

**Also see,** [http://www.radfreenm.org/images/PDF/MWL/MWL\\_exec\\_rpt\\_1-2011.pdf](http://www.radfreenm.org/images/PDF/MWL/MWL_exec_rpt_1-2011.pdf)

On February 24, 2014, the WPAB sent a letter to NMED Tom Blaine citing the history of its concerns for the MWL including the need for 5-year re-evaluations and reporting. The WPAB stated, “a legitimate case can be made that the clock on the five-year reports should have started when the Final Order was issued in 2005, which would have required the first five-year report in 2010.” The WPAB advised that the re-evaluation should be produced by

the end of 2014. The WPAB also hosted a forum for public comment on the Long Term Monitoring and Maintenance Plan (LTMMMP) for the MWL. The 2016 Final Order for the MWL ordered the Sandia 5-Year Review to take place in 2019.

**Applicable Federal Codes:** Federal code violations are present if we consider a long-term scenario where MWL wastes are left in place:

- Federal regulations clearly state that institutional controls cannot be assumed to last for over 100 years in 10 CFR 61.59(b).
- 40 CFR 264.111(a) requires closure in a way that “minimizes the need for further maintenance.” Leakage of waste at the MWL could continue for the next several thousands of years well beyond ability to continue institutional controls for maintenance.
- 40 CFR 264.310 (a)(2) and 265.310 (a)(2) require that the final cover of the landfill must be designed and constructed to “function with minimum maintenance.” 264.310 (a)(4) and 265.310 (a)(4) state the final cover must be designed and constructed to “accommodate settling and subsidence so that the cover’s integrity is maintained.” Substantial geological instability exists in the area of the MWL with four different fault zones.
- 40 CFR 265.111(b) and 264.111(b) (closure must control, minimize or eliminate post-closure escape of hazardous waste to the ground, surface waters or atmosphere). Hazardous waste has already escaped from beneath the MWL .
- 40 CFR 264.310 (a)(1) and 265.310 (a)(1) landfill cover must be designed and constructed “to provide long-term –minimization of migration of liquids through the closed landfill...”
- 40 CFR 264.314 (f)(2) and 265.315 (g)(2) (must not be “risk of contamination of any underground source of drinking water” from placement of liquids in the landfill). The Corrective Measures Study did not assess the risk that migration of water through the MWL will have on aquifers, human health and the environment.

A vegetative cover is not sufficient to prevent accidental ignition or explosion of ignitable wastes in the MWL. 40 CFR 264.312 and 265.17 outline requirements for storage of ignitable waste. Sections 265.17(b)(1) and 264.17(b)(1) require precautions to prevent the generation of “extreme heat or pressure, fire or explosion, or violent reaction.

If an onsite RCRA landfill were constructed it would have to meet specific landfill requirements for construction as well as post-closure care requirements found in 40 CFR part 264 or 265 Subpart N. The types of mixed chemical, metal and radioactive wastes currently in the MWL would be poor onsite disposal candidates for meeting Subtitle C goals for long-term maintenance, resisting the generation of leachate and emissions that could penetrate the liners, and provide containment for what would be perpetuity. DOE Order 435.1 requires that the MWL would need at least one thousand (1,000) years of post-

closure care to remain protective. There is no Closure Plan and no Post-Closure Plan for the MWL.

### **CONCLUSION**

Citizen Action New Mexico, numerous other organizations and the public have recommended the remedy of excavation of the dump and offsite disposal since early 2000. Excavation with offsite disposal was an alternative described in Appendix H of the MWL Corrective Measures Study.

[https://www.env.nm.gov/HWB/SNL/CMS/App\\_H\\_Eval\\_of\\_Near-Term\\_Excavation.pdf](https://www.env.nm.gov/HWB/SNL/CMS/App_H_Eval_of_Near-Term_Excavation.pdf) . See also, *Technical Approach and Cost Estimate for Excavation of the Classified Area Using Robotics*

[https://www.env.nm.gov/HWB/SNL/CMS/App\\_G\\_Tech\\_Approach\\_HYPERLINK](https://www.env.nm.gov/HWB/SNL/CMS/App_G_Tech_Approach_HYPERLINK)  
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The Sandia 5 Year Review describes that excavation with offsite disposal can now be accomplished.. We request that in the interest of protection of the public health and safety and Albuquerque's soil and water that the WPAB request the NM Environment Department Order Sandia to prepare a Corrective Measures Implementation Plan for excavation with offsite disposal to clean up the MWL dump site.

Respectfully submitted, May 8, 2023

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