

Synopsis of Reports by Citizen Action Independent Experts

Corrective Measures Study for Mixed Waste Landfill Sandia National Labs/U.S. Department of Energy

Background:

Through a grant awarded to Citizen Action from the Citizens' Monitoring and Technical Assessment Fund (CMTA), Citizen Action hired two consultants to independently review Sandia's study of options for the Mixed Waste Landfill. This study of options is known as a "Corrective Measures Study" or a CMS. The New Mexico Environment Department required Sandia to conduct a CMS for the Mixed Waste Landfill as a result of a request submitted by Citizen Action to investigate other alternatives for the waste.

Independent experts:

The consultants included Marvin Resnikoff, Radioactive Waste Management Associates; and Paul Robinson, Southwest Research and Information Center. A third report conducted by Erik Ringelberg, Upstream Technologies, Inc., was funded under a separate grant (NMSEES). For consistency purposes the conclusions from his report are also included in the synopsis. The three reports with each of the experts' background and credentials are posted in their entirety on the Citizen Action website at: radfreenm.org.

The following is a synopsis of the reports:

Review by Marvin Resnikoff, Radioactive Waste Management Associates

- Sandia's risk assessment does not take into consideration all of the wastes buried in the Mixed Waste Landfill nor does it take into consideration risks that will occur after institutional controls fail or are removed. The risk assessments for non-excavation alternatives are based on present-day conditions only, and do not consider the possibility that leakage of waste that has occurred since 1959 might continue over the next several thousand years.
- The Mixed Waste Landfill has been erroneously classified by Sandia as a "low-risk" facility where environmental problems are relatively small, and where releases present minimal exposure concerns.
- The "streamlined" approach taken by Sandia is an inappropriate method of dealing with the waste when the proposed remedy is not a phased approach and interferes with future options. A closure plan, not a streamlined near term approach, is the remedy that is warranted for the Mixed Waste Landfill.
- The waste characterization presented by Sandia/DOE is incomplete and does not correspond to the measured gamma readings at the site as well as information found in FOIA documents obtained by Citizen Action.

- Some of the canisters that contained oxide nuclear reactor fuels were carefully spaced apart in holes in pits in the Mixed Waste Landfill when they were disposed of, but other canisters were simply thrown into the pits. Careful spacing of the canisters in drilled holes in the trenches is an indication that residual oxide reactor fuel may have been contained in the canisters. Additionally, the spacing of the containers prevents the fuel from going critical. Whether they contain fuel or not there is evidence that some of the canisters became activated during the fuel experiments constituting greater than class C low-level waste or high level waste which by law is not allowed to remain buried in near-surface landfills.
- The evapotranspirative cover selected by Sandia as the preferred alternative will do nothing to prevent water already present in the landfill from continually leaching into soil below. Increased evapotranspiration from the vegetation may also draw contaminants upwards through the soil; the vegetation layer will not prevent microorganisms and burrowing animals from reaching the waste and spreading it; and the cover will not prevent plant roots from absorbing and transporting radionuclides back into the environment.
- The cost determined in the CMS for the future excavation alternative has been over-inflated and contains activities related to waste disposal which are exaggerated numbers. It is unnecessary to dispose of all wastes off-site; only the most dangerous and long-lived wastes will require off-site disposal while the short-lived wastes will decay quickly in the ground over the short-term.

Review by Paul Robinson, Southwest Research and Information Center

- The known inventory of waste disposed of at Sandia National Laboratories includes an unknown amount of transuranic (TRU) waste. Such wastes cannot be left in shallow burial. The Waste Isolation Pilot Project (WIPP) was built specifically as a repository for TRU wastes. Standards for Disposal of TRU waste are stated in regulations found at 40CFR191. Key provisions of the rules are found at 40CFR191.13(a). Containment requirements state:

“Disposal systems for spent nuclear fuel or high-level or transuranic radioactive wastes shall be designed to provide a reasonable expectation, based upon performance assessments, that the cumulative releases of radionuclides to the accessible environment for 10,000 years after disposal from all significant processes and events....”
- The CMS fails to provide for compliance with applicable regulations as it fails to propose a remedy that “controls source of releases” and does not accurately or comprehensively identify the volume, concentration and physical form of all potential “sources of releases,” the radioactive and hazardous constituents at the Mixed Waste Landfill. Instead, Sandia focuses on releases of contaminants already detected, not the “sources of the releases” which are the unidentified radioactive and hazardous (chemical) wastes buried in the landfill.

- The proposed remedy to cover the Mixed Waste Landfill fails to provide a remedy that complies with the New Mexico Hazardous Waste Management Regulations standard that requires a corrective measure and closure plan that:

“minimizes the need for active maintenance and controls, [or] minimizes or eliminates ... post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff or hazardous waste decomposition products to ground or surface waters or to the atmosphere.”
- The proposed remedy (cover with long-term institutional controls) that provides for no further efforts to investigate:
 1. the extent of contamination at the site;
 2. the full inventory of radioactive and chemical constituents of concern including the full range of potential sources of release of radioactive and chemical constituents of concern;
 3. decomposition or deterioration of constituents of concern and bags, boxes and other waste containers; or
 4. options for retrieval of hazardous or radioactive materials at the site should additional releases of constituents of concerns occur.
- The CMS fails to address long-term risks to groundwater at the Mixed Waste Landfill. This concern is of fundamental importance as the site overlies the groundwater supply that provides the primary drinking water supply for the Albuquerque area. Prior to detection of groundwater contamination at multiple landfill sites, Sandia’s field studies supported modeling that predicted that releases from landfills would not impact groundwater.
- The CMS is deficient as it fails to propose a corrective measure that meets acceptable waste management standards including the standard to protect human health and the environment at 40CFR264.111 incorporated verbatim into the New Mexico Hazardous Waste Management Regulations. By recommending a corrective measure that simply covers the waste at the MWL and does not provide for either:
 - 1) excavation and treatment of waste dumped at the site, or
 - 2) containment systems for the sides and bottom of the MWL with institutional controls on land use,

NMED is recommending a remedy that requires perpetual active maintenance and leaves hazardous and radioactive waste in place where leachate generation and waste decomposition will be allowed to continue unabated.
- The CMS fails to identify all necessary information related to a remedy that provides for full excavation and treatment of wastes at the Mixed Waste Landfill such as the excavations accomplished at the Chemical Waste Landfill and Classified Waste Landfill at Sandia. The current proposed remedy is inappropriate

unless DOE/SNL establishes an enforceable financial guarantee based on a model such as the trust fund established for a mixed waste landfill at the DOE facility at Oak Ridge, Tennessee, when Governor Bill Richardson was DOE Secretary to ensure that such a remedy will be implemented fully.

Review by Erik Ringelberg, Upstream Technologies, Inc.

- Since the waste was dumped in unlined pits and trenches without the benefit of good record-keeping over the course of 30-years it is difficult to determine the exact contents of the Mixed Waste Landfill. In order to determine the risks associated with the buried waste it is necessary to conduct a “characterization” of the contents of the landfill. Characterization refers to identifying the total contents of the landfill, the types of waste, the location of waste, how much, how radioactive, how toxic, etc. Sandia’s characterization of the landfill could only be determined by using *statistical sampling analysis* followed by *randomized collection*. Mr. Ringelberg concluded that Sandia did not use *consistent* statistical sampling analysis when samples were taken thus making it impossible to determine the exact types and amounts of waste buried in the landfill. This failure to properly characterize the landfill affects the risk assessment as well as the preferred option for the waste.
- The Phase 2 RFI for the Mixed Waste Landfill dismisses as laboratory mistakes several soil measurements that show high concentrations of radioactivity, while the measurements showing extremely low concentrations were not similarly dismissed. Laboratory errors can be corrected using statistical analysis.
- Sandia failed to include in its analysis the potential for contaminants to reach the groundwater beneath the Mixed Waste Landfill because it felt that the groundwater was too far (600-ft.) beneath the surface. However, contaminants from other landfills at Sandia have reached the aquifer, and similar sites at DOE facilities (INEEL, Idaho) have reached the groundwater 400-600 beneath the surface. Of even greater interest is the fact that the sites at the INEEL are located 51 miles from the nearest metropolitan area and DOE has decided to remove and stabilize those wastes.
- Sandia calculates cost for leave in place alternatives based on 30-years instead of the indefinite life of the contamination. At the very least the costs need to be accurately and equitably characterized for a period of at least 100 years based on DOE’s definition of institutional controls.
- The industry standard is to use competitive bidding to ensure that the costs of “clean up” are accurate are appropriate; however, Sandia’s costs for its alternatives are not based on competitive bidding which may artificially inflate the costs of each alternative proposed in the CMS.