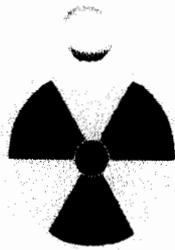


**CITIZEN
ACTION**



mwl

06-027

Advocating for clean up of Albuquerque's nuclear waste dump

June 7, 2006

John E. Kieling, Program Manager
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Bldg. 1
Santa Fe, New Mexico 87505-6303



Re: Recommendations re: Sandia National Laboratories' Mixed Waste Landfill Permit Modification - Corrective Measure Implementation Plan (CMIP) and Fate and Transport model (FTM) for the Mixed Waste Landfill.

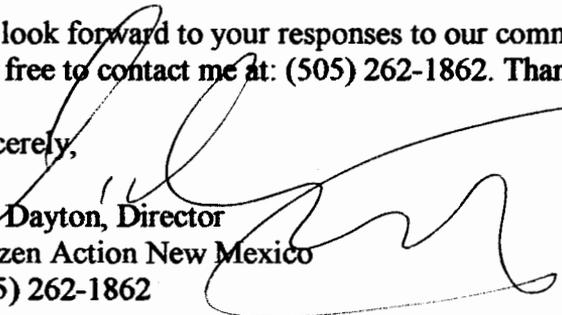
Dear Mr. Kieling:

Attached are recommendations compiled by Paul Robinson, Research Director for the Southwest Research and Information Center, on behalf of Citizen Action New Mexico re: Sandia National Laboratories' Corrective Measure Implementation Plan (CMIP) and Fate and Transport model (FTM) for the Mixed Waste Landfill.

For your convenience we have also attached recommendations submitted to the NMED under this comment period by Robert H. Gilkeson citing deficiencies in the construction of the monitoring wells and sampling methods currently used to detect contaminants at the Mixed Waste Landfill.

We look forward to your responses to our comments. If you have any questions please feel free to contact me at: (505) 262-1862. Thank you for your consideration.

Sincerely,


Sue Dayton, Director
Citizen Action New Mexico
(505) 262-1862

RECOMMENDATIONS

Sandia National Laboratories' Corrective Measure Implementation Plan (CMIP) Fate and Transport model (FTM) for the Mixed Waste Landfill (MWL)

Compiled by Paul Robinson, Research Director
Southwest Research and Information Center
(505) 262-1862

for

Citizen Action New Mexico
P.O. BOX 262
Sandia Park, NM 87047
sdayton@swcp.com
(505) 262-1862

June 7, 2006

**Citizen Action Recommendations
CMIP/FTM
Mixed Waste Landfill
Sandia National Laboratories**

Citizen Action New Mexico submits the following recommendations based on new information available to the New Mexico Environment Department (NMED) since the Sandia National Laboratories' Mixed Waste Landfill Permit Modification was approved.

The recommendations are based on new information from comments submitted by members of the public, the Corrective Measures implementation Plan (CMIP) and Fate and Transport model (FTM) for the Mixed Waste Landfill (MWL), and information presented at the Technical Discussion Public Meeting convened by the NMED on May 25, 2006:

I. General:

- A) NMED defer final approval of Mixed Waste Landfill Corrective Measure Implementation Plan (CMIP) pending review of a remedy based on new information in Fate and Transport Model (FTM) and additional information provided in response to NMED queries.**

- B) NMED revise its MWL "Permit Modification" to require submittal, review, and approval of a Long-term Monitoring and Maintenance Plan (LMMP) on a schedule parallel to the schedule for the remaining portions of the CMIP rather than deferring the submittal of the LMMP until the 180 days following completion of the construction of the corrective measure as may be approved in the future.**

These recommendations are based on information presented in the CMIP, FTM, public comments and the Technical Discussion Public Meeting of May 25, 2006, to demonstrate that the effectiveness of the CMIP is dependent on the implementation of the Long-term Monitoring and Maintenance Plan (LMMP) associated with the CMIP as installed and operated.

In the CMIP, SNL/DOE provided substantial information regarding critical portions of the needed LMMP including trigger levels and moisture monitoring systems.

The LMMP should include, but not be limited to:

- 1. Bio-monitoring program including establishment of bio-monitoring triggers at a significant increase over background to establish baseline and identify bio-accumulation, if any, in plant, animal and insects species in and around the MWL for as long as the waste remains in place. This program would include the identification of specific**

species to be monitored, frequency of sampling, and type of contaminants to be monitored (radiological, volatile organic compounds (VOCs), and heavy metals).

2. Require SNL/DOE to establish and maintain site access controls and use restrictions as identified in the CMS and Administrative Order on Consent Based immediately.
 3. Vadose zone monitoring of VOCs, moisture and an appropriate suite of radionuclides and metals to verify model outputs; establishment of a statistically defensible baseline; and consideration of continuous monitoring.
 4. Reinstalled monitoring wells before any cover is installed to insure that drilling equipment does not damage the evapotranspirative cover for the MWL.
- C) NMED require replacement of the existing set of monitoring wells and acquire a comprehensive suite of data from the replacements wells based on the analysis of MWL construction and sampling data recommended by R. H. Gilkeson and provided to NMED as comments and recommendations regarding the MWL CMIP and FTM.

Citizen Action recommends that the ground water monitoring wells at the MWL be replaced with wells that meet regulatory standards including RCRA standards capable of meeting applicable data quality objectives and providing reliable and verifiable water quality and soil column data.

Citizen Action recommends that NMED conduct an independent analysis of the effectiveness of the monitoring wells to identify the occurrence of VOCs and other constituents of concern including those modeled in the FTM.

The monitoring well replacements are needed due to the defects in well construction and completion and the generation of unreliable data about water quality below the MWL. The replacement wells are needed to:

1. Conduct lawfully adequate characterization of soil column and upper most aquifer;
 2. Provide accurate and verifiable groundwater sampling data including appropriate trigger levels; and
 3. Refine and enhance the FTM model.
- D) NMED require a revised set of geophysical surveys of the MWL to update and enhance the Phase 2 data on to provide detailed information about the shape, distribution and content of containers in the MWL, the distribution of metals and other materials in landfill, and otherwise expand knowledge of

inventory. This updated geophysical baseline should include replication of geophysical investigations in the RFI Phase 2 Report with contemporary equipment and analytic capabilities as well as conduct of additional geophysical analyses including, but not limited to sonar, ground penetrating radar, and magnetic resonance.

II. Specific Recommendations:

- A) Full disclosure of FTM model input data;
- B) A revised and expanded FTM to address the range of parameters associated with “model uncertainties/sensitivities” – including vadose zone profile (Kd), half-life (degradation), inventory of VOCs, as identified at FTM p. 57;
- C) The implementation of a subsurface sampling program to identify distribution of VOCs detected in the MWL RFI Phase 2 Report to verify and/or refine FTM model results, applying including appropriate QA/QC methods including split sampling with NMED incorporating duplicates and blank samples to verify analytic accuracy;
- D) Establishment of trigger levels for agency and public notification and initiating responsive action at values 50% - 100% above background and/or 50% above detection limit for VOCs identified in 1993-4 and technogenic radionuclides, and an appropriate suite of metals and naturally-occurring radionuclides;
- E) Establishment of a shallow (less than 50 foot depth) subsurface monitoring program in the vadose zone for detection of VOCs as part of long-term a maintenance and monitoring plan and apply triggers at those sites;
- F) An enhanced version of the FTM be run for the *full range* of VOCs identified in soil in the MWL RFI Phase 2 Report including, but not limited to dichloro-difluoromethane; trichloroethene; 1,1,1-trichloroethane (TCA), toluene, ethylbenzene, xylene, 1,1,2-tri-chloro-trifluoroethane, dichloroethyne, acetone, isopropyl ether, 1,1-dichloroethene and styrene. The MWL RFI Phase 2 Report identifies dichloro-difluoromethane concentrations of 29,000 ppb at 10 feet and 21,500 ppb at 30 feet at Fir 4.5 – 16 and Fig. 4.5-22, which are 4 – 5 times higher than the concentrations of PCE detected at those depths in the same report;
- G) The enhanced FTM realizations include considerations of VOC concentrations 100x and 1000x the concentrations identified in soil the MWL RFI Phase 2 Report;

- H) Identification, compilation and review of container deterioration data applicable to containers identified at or likely to have been disposed of at the MWL including information from other SNL, Lockheed, and DOE sites to determine container patterns applicable to the MWL;
- I) Identification and submittal to NMED and review other models of VOC movement conducted by Sandia for other waste sites at SNL including, but not limited to the Chemical Waste Landfill, Liquid Waste Disposal System, and Lurance Canyon sites located at SNL.

III. CMIP Recommendations

- A) Locate run-off and run-on collection and diversion canals/swale away from the perimeter of cover system to manage flows from peak precipitation events - 25 to 50 meters;
- B) Include an erosion resistant layer (armor) to reduce wind erosion effects;
- C) Identify specific vegetative cover standards for determination of re-vegetation success including, but not limited to, species diversity, plant survival, and ground cover parameters.

Assessment That the Monitoring Wells Installed at the Sandia Mixed Waste Landfill do not Meet the Requirements of the RCRA Statute Subpart F, the NMED Consent Order, or DOE Orders for Selection of Remedy or for Long-Term Compliance Monitoring, Final Version. 06-05-06 by

Robert H. Gilkeson, Registered Geologist *and*

RCRA Qualified Groundwater Scientist

RHGilkeson@aol.com

(505) 412-1930, P.O. Box 670, Los Alamos, NM 87544

Executive Summary. The strategy to leave chemical and radioactive waste at the Sandia mixed waste landfill and to assure protection of the regional aquifer by long-term monitoring of the existing set of monitoring wells is unacceptable because of the poor quality of the water samples produced from the wells. There are many important factors for why the wells do not meet the regulatory requirements for detection monitoring:

- Drilling additives with well known chemical properties to mask the detection of contamination were allowed to invade the strata that surround the wells.
- The drilling additives lowered the permeability of the strata surrounding the wells so that the wells produce stagnant water that was in contact for a long period of time with the strata affected by the drilling additives.
- The wells are sampled with procedures that strip from the water the volatile contaminants that are known to be released from the landfill (e.g., PCE).
- The wells are sampled with procedures that expose the water to oxygen and therefore, many metal and radioactive contaminants known to be disposed of at the landfill are hidden from being detected.
- The wells are not installed in the aquifer strata with high permeability – the strata where the highest levels of contamination are expected and the strata that are fast pathways for horizontal travel of contaminated groundwater over great distance.
- The wells are not installed in the unsaturated strata beneath the landfill to monitor the levels of toxic volatile contaminants (e.g., PCE) and tritium that are released over time from the landfill.

Because of the above factors, the existing network of monitoring wells at the Sandia mixed waste landfill do not meet the requirements of the RCRA Statute, the NMED Sandia Consent Order, or the DOE Orders for the detection of contamination released from the waste buried in the landfill. The monitoring wells do not provide the scientifically sound and legally defensible data that are required to identify the best long-term remedy for the mixed waste landfill.

The current strategy to cover the waste disposed of at the mixed waste landfill with an engineered earthen cover is not supported by the spurious data from the monitoring wells. The final remedy for the Sandia mixed waste landfill must wait until a network of monitoring wells are installed that produce reliable data on the presence or absence of contamination in soil air and in groundwater now and in the future. A reliable network of monitoring wells must be installed before the installation of an engineered earthen cover because the heavy weight of drilling equipment will do irreparable damage to the earthen cover.

The failure of Sandia National Laboratory, the Department of Energy, and the New Mexico Environment Department to install the needed network of monitoring wells that are in compliance with Federal and State Regulations and that provide accurate data for the remedy is a serious issue that requires formal investigation and reconciliation.