ALBUQUERQUE'S ENDANGERED AQUIFER -- SANDIA NATIONAL LABORATORIES MIXED WASTE LANDFILL

PREPARED FOR:

Sandia Working Group of NM SEES –
New Mexicans for Sustainable Energy and Effective Stewardship Program
And Citizens for Alternatives to Radioactive Dumping (CARD)

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UNRESOLVED ISSUES -- FACT SHEET

The Sandia National Laboratories' Mixed Waste Landfill (MWL) is located in a growing, urban area above the aquifer that supplies Albuquerque's municipal wells. The MWL wastes were dumped in unlined pits and trenches, with no engineered system in place for detection and collection of toxic liquids moving beneath the dump.

By today's health and safety standards mixed radioactive and hazardous wastes should never be disposed of a mile away from a children's park and residential homes. Yet, that is what Sandia and the New Mexico Environment Department (NMED) have decided to allow without having reliable information about the movement of the wastes beneath the dump.

The MWL is near the Mesa del Sol residential development for 80,000 to 100,000 people, the Pueblo of Isleta lands and communities in the South Valley. The 2.6-acre dumpsite has an estimated 1,500,000 cu ft of radioactive and mixed hazardous wastes from making nuclear weapons. *The wastes lie above Albuquerque's drinking water aquifer in plastic bags, cardboard boxes and steel drums. Sandia officials cannot fully say what is really in the MWL dump.* Contamination is present now in the groundwater below the MWL dump.

The DOE uses the MWL dump as a success model for how DOE should dispose of radioactive wastes under dirt covers at Sandia, Los Alamos National Laboratory and other sites in the nuclear weapons complex.

No reliable groundwater monitoring network has ever been in place to monitor the groundwater beneath the dump. The New Mexico Environment Department, the Environmental Protection Agency and DOE/Sandia knew in the early 1990s that the groundwater monitoring wells were put in the *wrong locations* at the MWL dump. The agencies knew also that the wells had *corroded well screens* and were *contaminated with Bentonite clay that hides evidence of contamination*. Shortly after four monitoring wells were installed it was learned that the flow of groundwater was not to the northwest, but to the southwest. The monitoring wells were providing data that could not possibly be accurate. Nevertheless, the NMED accepted the erroneous data to make the decision in 2005 to leave the MWL dump wastes in place under a dirt cover.

A congressionally appointed commission called WERC investigated the MWL but was not provided information regarding the out of place, defective groundwater monitoring network. The flawed data was accepted by WERC as correct and as being from a reliable monitoring network.

Sadly, witnesses for Sandia and the Environment Department testified at the public hearing in 2004 for the dirt cover remedy that there were reliable monitoring wells and "no evidence of contamination to the groundwater." The government witnesses knew that the monitoring network was in the wrong location, incapable of detecting contamination and that the data from the wells was not reliable to make the remedy decision to leave the wastes in place.

Sandia Labs saved hundreds of millions of dollars by not treating or excavating the wastes while putting public health and the environment at risk.

Citizen Action and Registered Hydrogeologist Robert Gilkeson filed a complaint in 2007 with EPA Region 6 that the monitoring well network was defective.

A $275,000 investigation (April 2010) by the Environmental Protection Agency Office of Inspector General found that EPA Region 6 staffers had concerns similar to Citizen Action's about the landfill's affect on groundwater and the lack of effective groundwater monitoring at the

MWL dump. However, the Inspector General also found the *Oversight Report* of the EPA staff's MWL dump concerns are still being kept secret from Citizen Action and the public. http://www.fas.org/sgp/othergov/ig-epa-reg6.pdf

EPA Region 6 and the EPA Office of Inspector General are both withholding secret documents that show the groundwater monitoring at the MWL dump did not support the decision to leave the wastes in place under a dirt cover. http://www.sej.org/publications/watchdog-tipsheet/bush-epa-suppressed-nm-waste-records-sidestep-foia
http://www.allbusiness.com/government/government-bodies-offices/14290348-1.html
http://www.fas.org/blog/secrecy/2010/05/epa_ig.html

New Mexico Environment Department uses flawed data and disregards public concerns.

The New Mexico Environment Department sued Citizen Action to keep a 2006 TechLaw, Inc. report secret until late 2009. NMED commissioned the expert TechLaw report with taxpayer money. The TechLaw report reveals flaws in the dirt cover construction for long term protection and rejects Sandia's computer modeling for movement of the dump's wastes as a "black box" that should not be used. NMED withheld the TechLaw report during public meetings about wastes reaching groundwater. NMED withheld the TechLaw report from the EPA Inspector General. NMED used the flawed Sandia computer model in responses to wave aside public concerns.

New wells installed in 2008 are too deep to monitor at the water table level for detection of contamination. The well screens are too long at 30 feet. The sampling is done improperly. Sandia, EPA and the NMED know that data from the well monitoring network is highly flawed. Nevertheless, Sandia continues to submit the false data, NMED continues to accept the false data for decisions and EPA continues to withhold its reports from the public.

Sandia maintains that no liquids were in the MWL dump. However, for five decades, storm water run-on pooled in the unlined pits and trenches. 271,500 gallons of reactor coolant wastewater containing hexavalent chromium was deposited in Trench D at the MWL. 5,000 gallons of water were pumped into a trench to extinguish a depleted uranium fire in 1974. From June 2006 through July 2007, heavy rainfall breached berms that were supposed to prevent storm water from flowing across the site.

The MWL dump wastes have already begun to enter the groundwater. Nickel, chromium, cadmium and nitrates appeared in older defective monitoring wells that were installed in 1988 and 1989. Soil vapor studies conducted in 2007 show that cancer causing volatile organic solvents are moving deeper beneath the MWL dump. The presence of the dirt cover will actually accelerate the movement of solvents to the groundwater. Tritium concentrations are ten times higher and found at deeper levels than a decade ago.

The dirt cover will not prevent releases of waste from nuclear weapons production to future generations. Radioactive wastes such as Plutonium and Americium placed in the MWL dump will remain dangerous to the air and water for tens of thousands of years.

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SECTION I-- SANDIA LAB'S MIXED WASTE LANDFILL IDENTIFICATION OF PROBLEMS AND UNRESOLVED ISSUES

The Mixed Waste Landfill (MWL) is located in a growing, urban area approximately 460 ft above the aquifer that supplies Albuquerque, New Mexico's public drinking water. The MWL wastes were dumped in unlined pits and trenches, with no engineered system in place for detection and collection of toxic liquids moving beneath the dump. The MWL covers 2.6 acres of technical area 3 at Sandia National Laboratories (SNL). (See Figure 3).

The MWL dump has an estimated 1,500,000 cu ft of radioactive and mixed hazardous wastes from making nuclear weapons. *Sandia officials cannot fully say what is really in the MWL dump. The wastes lie above Albuquerque's drinking water aquifer in plastic bags, cardboard boxes and steel drums* (See figures 4 and 5).

- Contamination from cadmium, nickel, chromium, nitrates and possibly PCE has reached the groundwater below the MWL dump. Tritium is entering air and soil. Over 100 drums containing Plutonium-239 and Americium-241 mixed waste will be a threat for tens of thousands of years.
- The landfill was operational from March 1959 to December 1988, accepting radioactive and hazardous wastes from both SNL and other sites. The inventory of wastes deposited in the landfill from 1959 to 1964 is still classified by the Department of Energy and is unavailable.
- The MWL dump lies approximately one mile near the Mesa del Sol residential development for 80,000 to 100,000 people and a planned children's park. The MWL is north of the Pueblo of Isleta lands and east of communities in the South Valley. The MWL dump is approximately 5 miles southeast of Albuquerque International Sunport.
- By today's health and safety standards mixed radioactive and hazardous wastes should never be disposed of near residential neighborhoods. Yet, that is what Sandia and the New Mexico Environment Department (NMED) decided to allow without having reliable information from a groundwater monitoring network about the movement of the wastes beneath the dump.
- The DOE uses the MWL dump as a success model for how DOE should dispose of radioactive wastes under dirt covers at Sandia, Los Alamos National Laboratory and other sites in the nuclear weapons complex.

No reliable groundwater monitoring network has ever been in place to monitor the groundwater beneath the dump.

- The New Mexico Environment Department, the Environmental Protection Agency and DOE/Sandia knew in the early 1990s that the groundwater monitoring wells were put in the *wrong locations* at the MWL dump.
- Shortly after four monitoring wells were installed to the north and west based on an assumed flow of groundwater to the northwest, it was learned groundwater flow was to the southwest.
- The monitoring wells were improperly positioned, providing data that could not possibly be accurate.
- The regulatory agencies also knew that the wells had *corroded well screens* and were *contaminated with Bentonite clay that hides evidence of contamination*.

- Nevertheless, the NMED accepted the erroneous data to make the decision in 2005 to leave the MWL dump wastes in place under a dirt cover.

The 1998 NMED Notice of Disapproval (NOD) Report required DOE/Sandia to install two new monitoring wells west of the MWL dump with the well screens installed across the water table in the fine-grained alluvial fan sediments. Accordingly, wells MWL-MW5 and -MW6 were installed west of the MWL dump in 2000. However, the geologic cross-section in Figure 6 shows that the screens in the two monitoring wells were installed too deep for the intended purpose to monitor at the water table in the fine-grained alluvial fan sediments.

A congressionally appointed commission called WERC investigated the MWL but was not provided information regarding the out of place, defective groundwater monitoring network. The data from the flawed groundwater monitoring wells was accepted by WERC as correct and as being from a reliable monitoring network.

Witnesses for Sandia and the Environment Department incorrectly testified at the December 2004 public hearing for the dirt cover remedy that there were reliable monitoring wells and "no evidence of contamination to the groundwater." The administrative record shows that:

- government witnesses knew that the monitoring network was in the wrong location,
- incapable of detecting contamination and that
- the data from the wells was not reliable to make the remedy decision to leave the wastes in place.

Sandia Labs saved hundreds of millions of dollars by not treating or excavating the wastes while putting public health and the environment at risk.

In 2007,Citizen Action and Registered Hydrogeologist Robert Gilkeson filed a complaint with EPA Region 6 that the monitoring well network was defective.

A $275,000 investigation (April 2010) by the Environmental Protection Agency Office of Inspector General found that:

- EPA Region 6 staffers had concerns similar to Citizen Action's about the landfill's affect on groundwater and the lack of effective groundwater monitoring at the MWL dump.
- the *Oversight Report* of the EPA staff's MWL dump concerns are still being kept secret from Citizen Action and the public. http://www.fas.org/sgp/othergov/ig-epa-reg6.pdf

EPA Region 6 and the EPA Office of Inspector General are both withholding secret documents that show the groundwater monitoring at the MWL dump did not support the decision to leave the wastes in place under a dirt cover. http://www.sej.org/publications/watchdog-tipsheet/bush-epa-suppressed-nm-waste-records-sidestep-foia
http://www.allbusiness.com/government/government-bodies-offices/14290348-1.html
http://www.fas.org/blog/secrecy/2010/05/epa_ig.html

New Mexico Environment Department uses flawed data and disregards public concerns.
The New Mexico Environment Department sued Citizen Action to keep a 2006 TechLaw, Inc. taxpayer paid report secret until late 2009. The TechLaw report:

- reveals flaws in the dirt cover construction for long term protection,

- rejects Sandia's computer modeling for movement of the dump's wastes as a "black box" that should not be used.

NMED withheld the TechLaw report during public meetings about wastes reaching groundwater. NMED withheld the TechLaw report from the EPA Inspector General. NMED used the flawed Sandia computer model in responses to the public to wave aside their concerns.

New wells installed in 2008 are too deep to monitor at the water table level for detection of contamination.

- The drilling operations were incorrect and the well screens are too long at 30 feet.
- The sampling is done improperly.
- Sandia, EPA and the NMED know that data from the current well monitoring network is highly flawed.
- Nevertheless, Sandia continues to submit the useless data, NMED continues to accept the false data for decisions and EPA continues to withhold its reports from the public.

Sandia incorrectly states that no liquids were in the MWL dump. However, for five decades:

- Storm water run-on pooled in the MWL unlined pits and trenches;
- 271,500 gallons of reactor coolant wastewater containing hexavalent chromium was deposited in Trench D at the MWL (See Figure 5);
- 5,000 gallons of water were pumped into Trench B to extinguish a depleted uranium fire in 1974. http://www.radfreenm.org/pages/resnikoff_review.htm.
- From June 2006 through July 2007, heavy rainfall breached berms that were supposed to prevent storm water from flowing across the site. Storm water run-off entered the MWL for decades.

The MWL dump wastes have already begun to enter the groundwater.

- Nickel, chromium, cadmium and nitrate appeared in older defective monitoring wells that were installed in 1988 and 1989.
- Soil vapor studies conducted in 2007 show that cancer causing volatile organic solvents are moving deeper beneath the MWL dump but were not investigated below the 50 ft depth.
- Tritium concentrations are ten times higher and found at deeper levels than a decade ago. Sandia computer models predicted groundwater contamination from the solvent PCE by 2010.
- The presence of the dirt cover will actually accelerate the movement of solvents to the groundwater.

The dirt cover installed over the Sandia MWL dump will not prevent releases of waste from nuclear weapons production to future generations. Radioactive wastes such as Plutonium and Americium placed in the MWL dump will remain dangerous to air and water for tens of thousands of years.

Figure 1. Location of the Sandia "Mixed Waste Landfill" (the Sandia MWL Dump) at Sandia National Laboratories Albuquerque Facility inside the Kirtland Air Force Base (KAFB). The map shows locations of drinking water supply wells and nearby Mesa Del Sol Subdivision and Pueblo of Isleta

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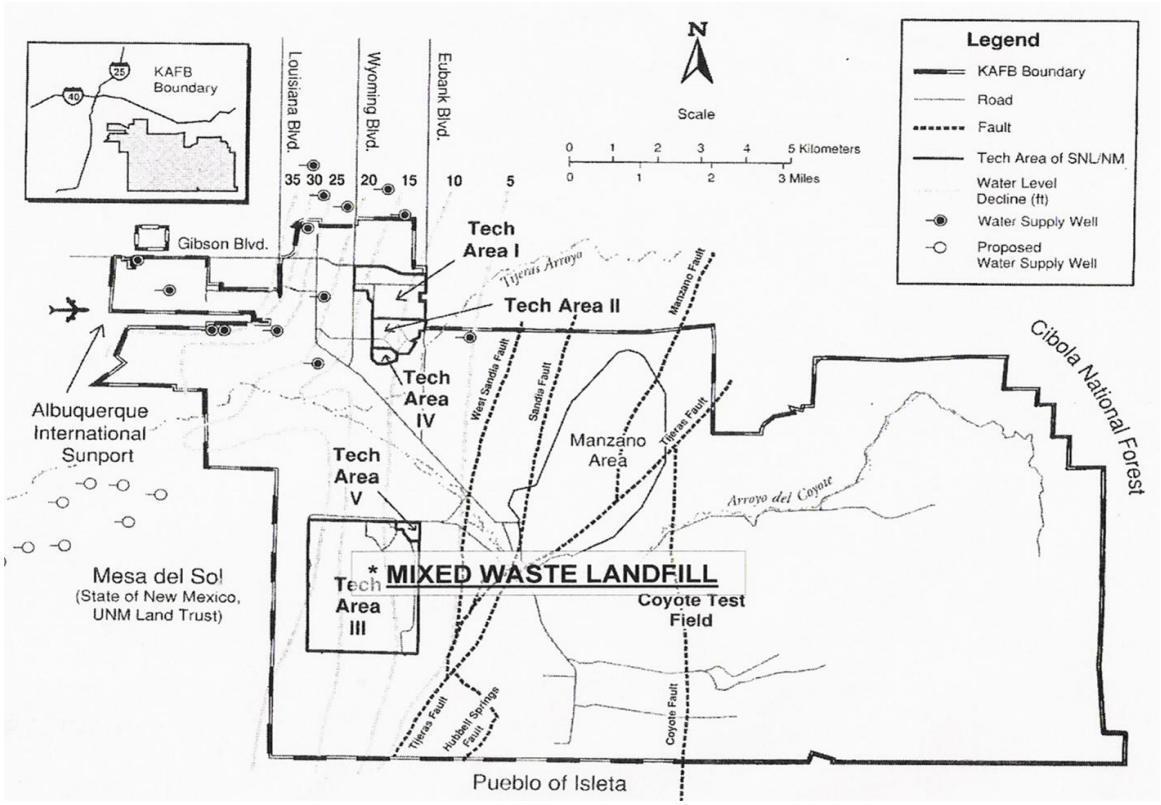
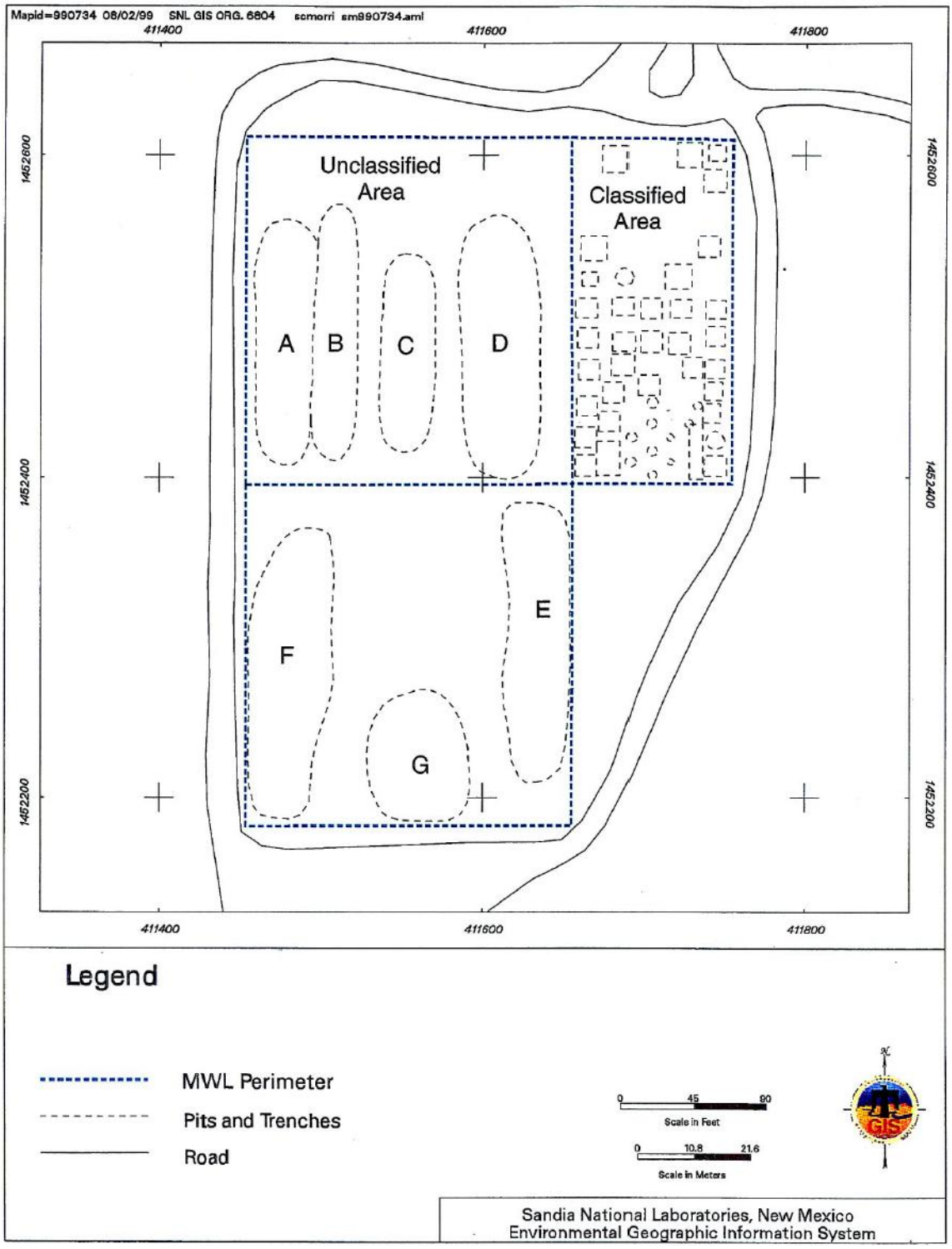
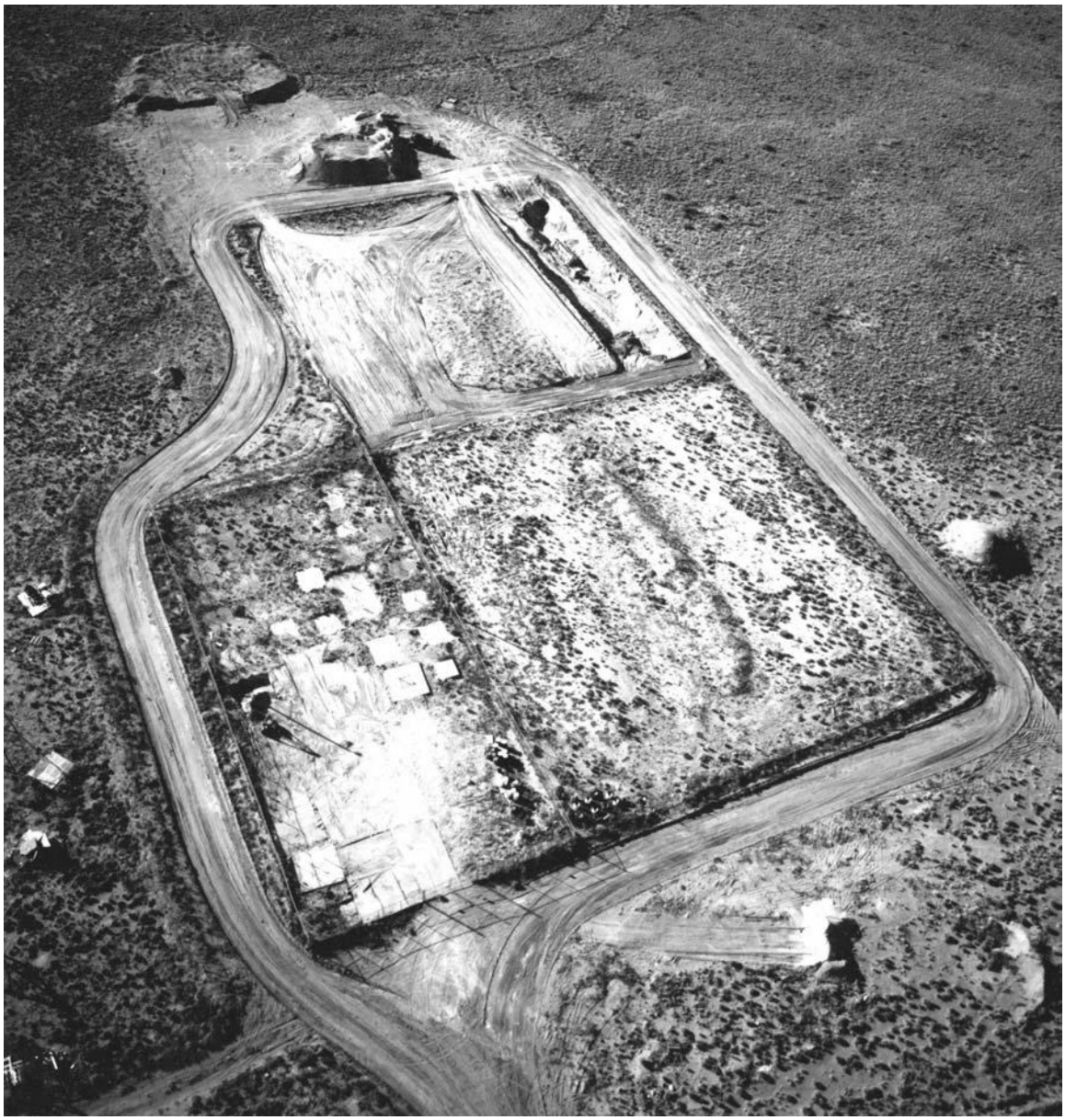


Figure 2. Map of the 2.6 acre Sandia Mixed Waste Landfill (Sandia MWL dump) showing the locations of the unlined disposal pits in the 0.6-acre Classified Area and the unlined disposal trenches in the 2-acre Unclassified Area.



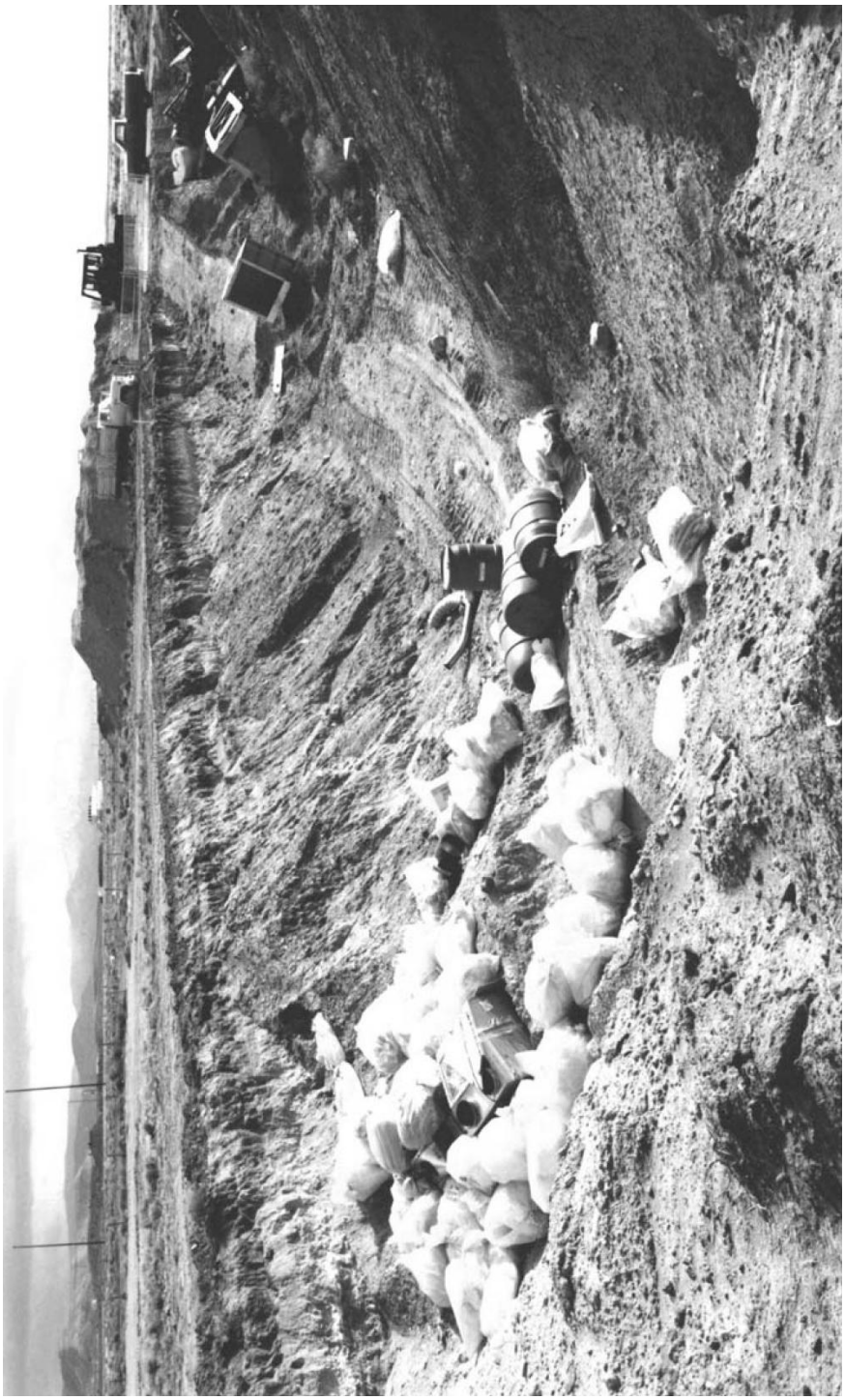
Source: Figure 1-3 in Sandia Report SAND 2002-4098 (Goering et al., 2002).

Figure 3. Aerial view of Sandia MWL dump looking to southwest in 1987. Trench F in the southwestern part of the Unclassified Area is open.



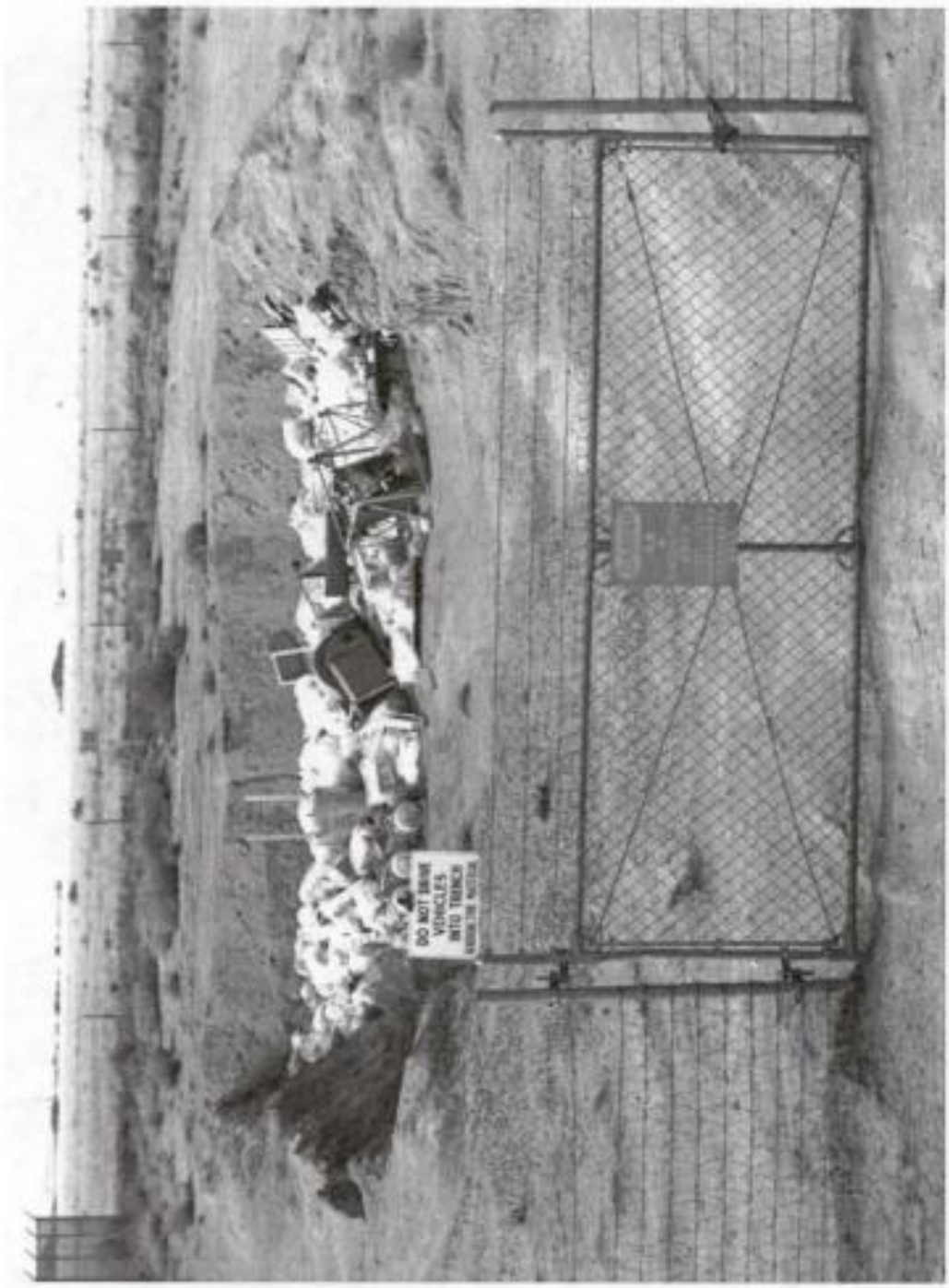
Source: Figure 3 in *Final Report - Independent Peer Review of the U.S. Department of Energy Sandia National Laboratories' Mixed Waste Landfill August 31, 2001* Performed by WERC: A Consortium for Environmental Education and Technology Development

Figure 4. View of wastes dumped into unlined Trench F in the Unclassified Area of the Sandia MWL dump. Picture in 1987 with view looking south.



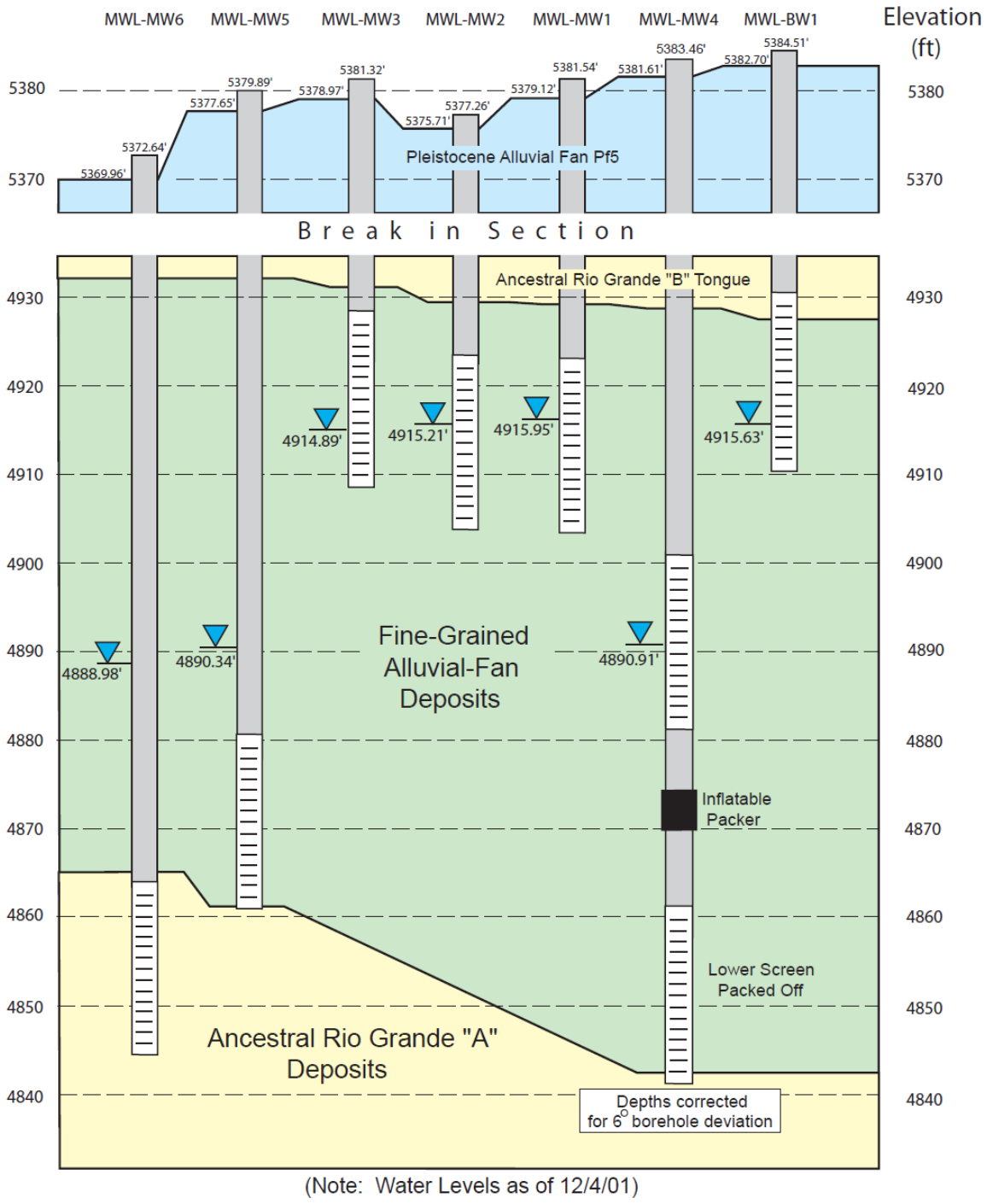
Source: Figure 7 in *Final Report - Independent Peer Review of the U.S. Department of Energy Sandia National Laboratories' Mixed Waste Landfill August 31, 2001* Performed by WERC: A Consortium for Environmental Education and Technology Development

Figure 5. View of wastes dumped into unlined Trench D in the Unclassified Area of the Sandia MWL dump. Picture in 1966 with view looking south.
NOTE: In 1967 270,000 gallons of reactor coolant waste water was disposed of into the wastes dumped into Trench D as of 1966.



Source: Figure 8 in *Final Report - Independent Peer Review of the U.S. Department of Energy Sandia National Laboratories' Mixed Waste Landfill August 31, 2001* Performed by WERC: A Consortium for Environmental Education and Technology Development

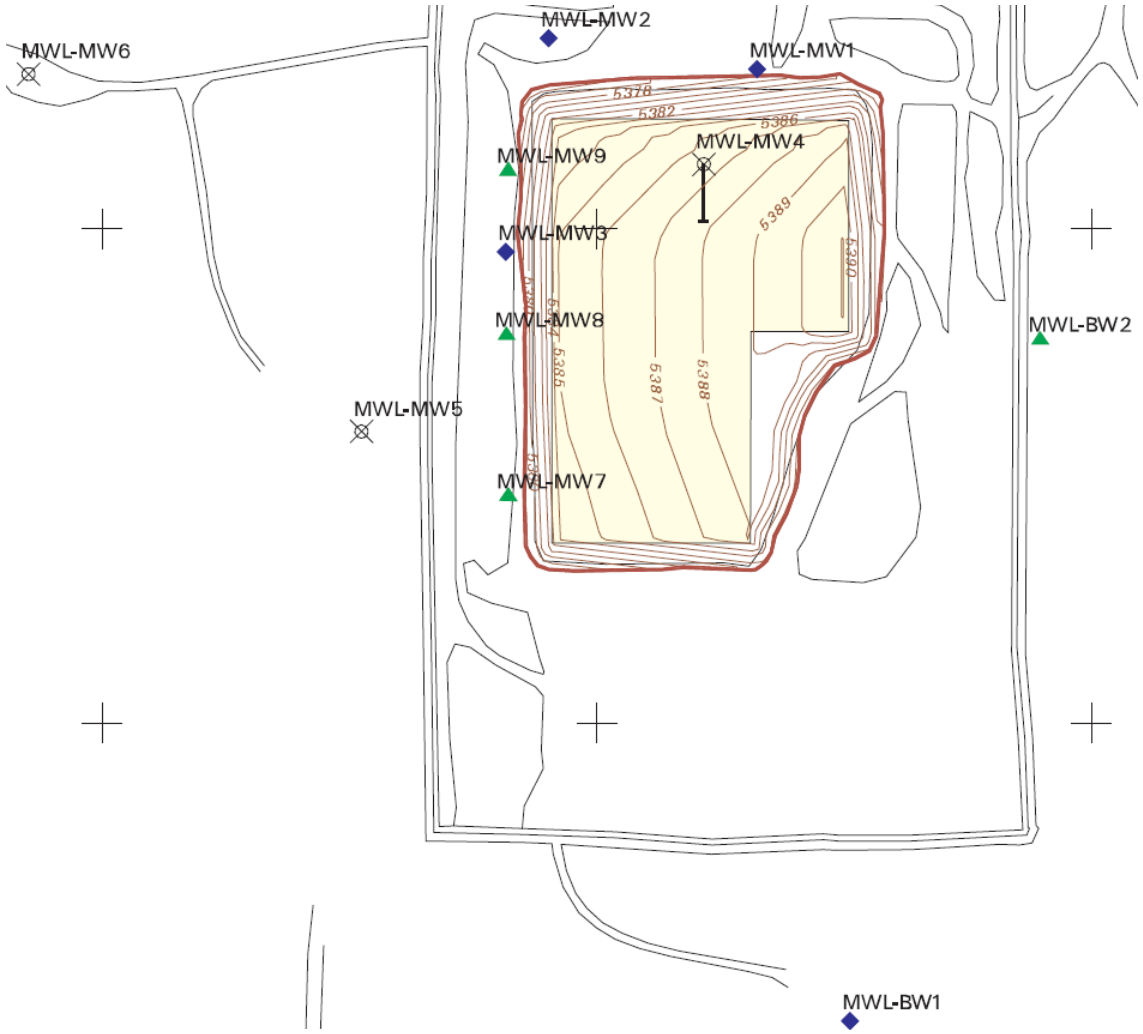
Figure 6. Schematic of the Monitoring Wells and the Hydrogeologic Setting at the Sandia MWL dump. The permeable sands and gravels in the Ancestral Rio Grande "A Deposits (ARG deposits) are the valuable groundwater resource for Albuquerque and the surrounding region.



Source: Figure 3-13 in *Mixed Waste Landfill Groundwater Report, 1990 through 2001, Sandia National Laboratories, Albuquerque, New Mexico* SAND 2002-4098 (Goering et al., 2002).

Figure 7. Location of the eleven monitoring wells installed at the Sandia MWL dump over the years 1988 to 2008. The first four monitoring wells (MWL-MW1, -MW2 –MW3 and -

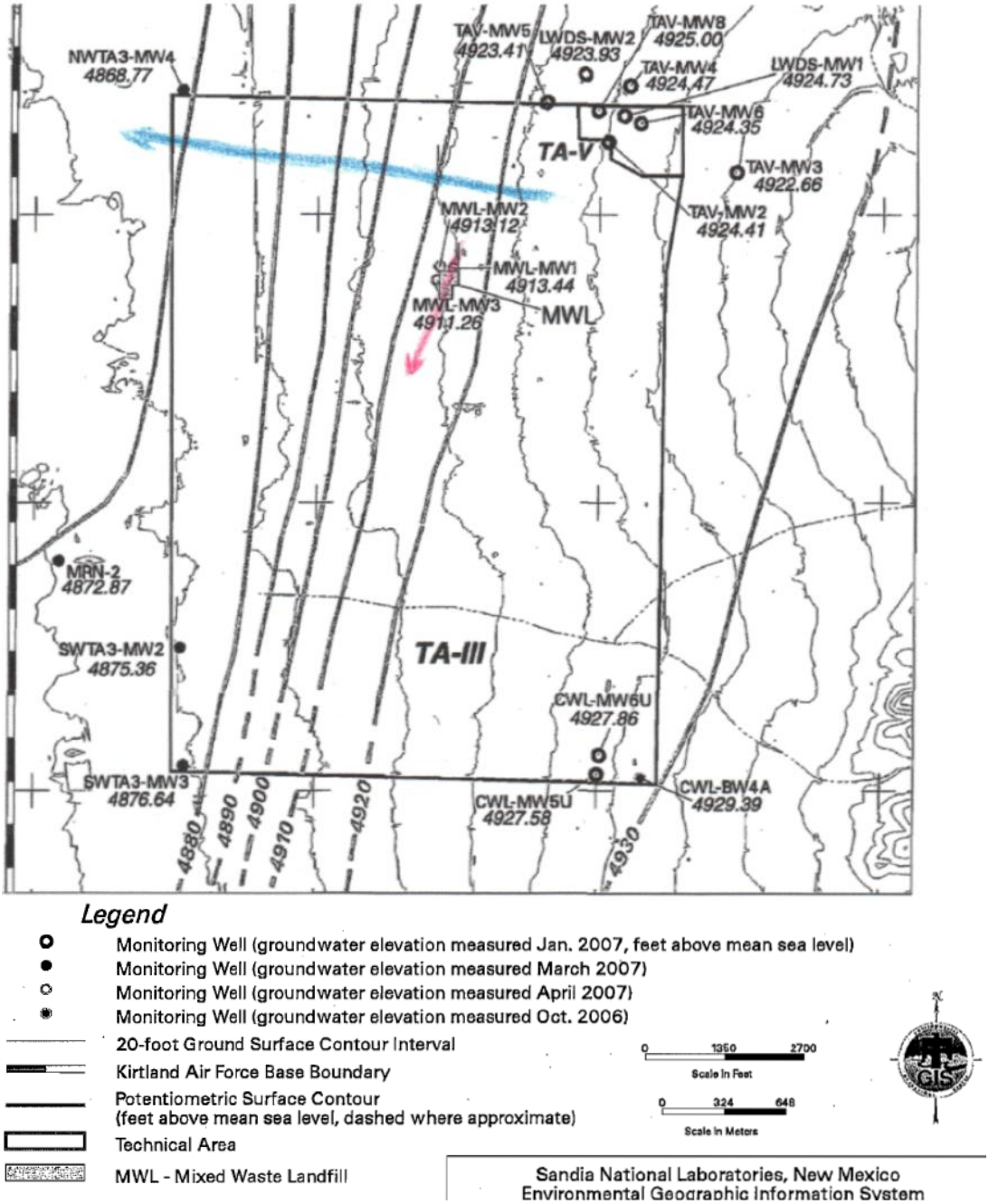
BW1 were installed in 1988 – 1989. The four new monitoring wells MWL-MW7, -MW8, -MW9 and -BW2 were installed in 2008.



Scale 0……200 feet

Source: Figure 1-2 in Mixed Waste Landfill Groundwater Monitoring Report Calendar Year 2008, Sandia National Laboratories, May 27, 2009

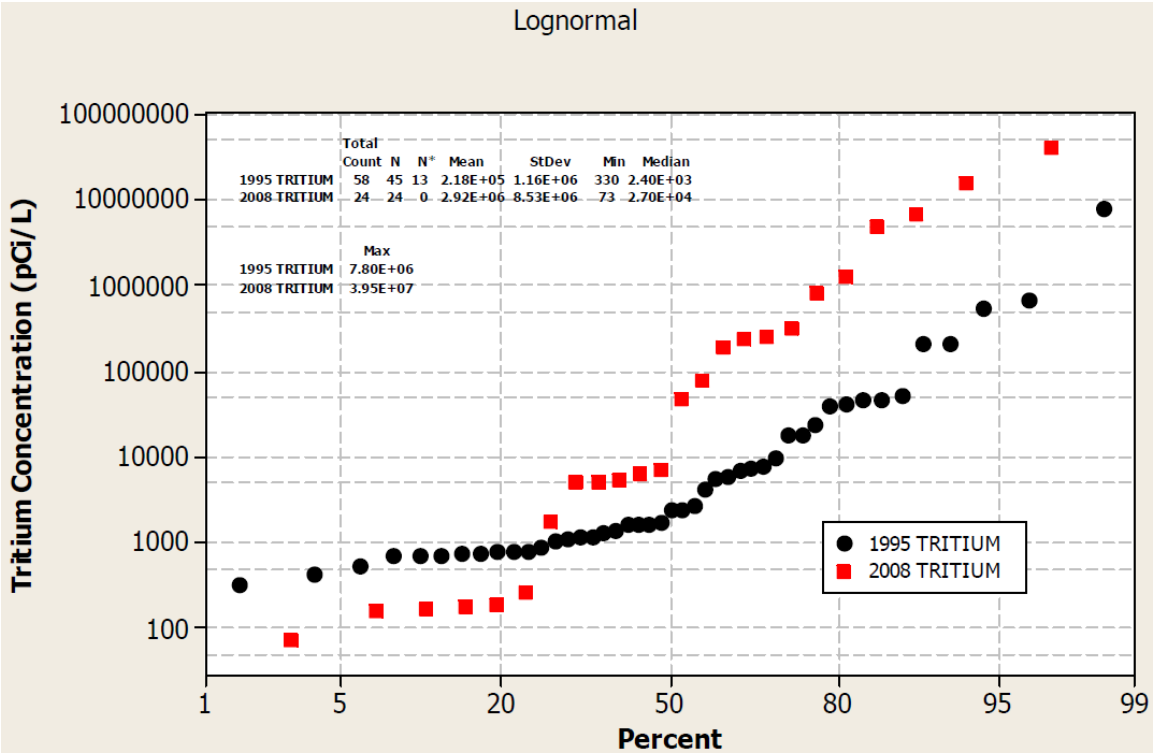
Figure 8. The regional water level contour map in the *Sandia 2008 Mixed Waste Landfill Annual Groundwater Monitoring Report.* The map incorrectly shows the direction of groundwater travel below the MWL dump is to the northwest. The MWL dump is at the center of the figure.



- **The red line is the direction of groundwater flow at the water table below the MWL dump for the water table elevations posted on the map for wells MWL-MW1, -MW2 and -MW3**
- **The blue line is the direction of "regional" groundwater flow for the data from wells located miles away from the MWL dump**

SOURCE: Figure 4.1-2 in *Mixed Waste Landfill Annual Groundwater Monitoring Report, Spring 2007 Sampling Event* Report Issued in February 2008.

Figure 9. Comparison of 1995 and 2008 Tritium sediment sample analytical results for the 10-, 30- and 50-foot depth samples at the Sandia MWL dump.



- **An enlarged view of the Tritium Maximum Concentration Data posted on the above figure is below:**

- **7,800,000 pCi/L = Maximum Tritium Concentration in 1995 Sediment Samples**
- **39,500,000 pCi/L = Maximum Tritium Concentration in 2008 Sediment Samples**
- **3,900,000 pCi/L = Expected Maximum Tritium Concentration in 2008 Sediment Samples**

Note: The half-life of tritium is 12.3 years. Therefore, the maximum tritium concentration measured in the 2008 soil samples was expected to be 50% less than the maximum value measured 13 years earlier in 1995. The maximum value expected to be measured in the 2008 study was approximately 3,900,000 pCi/L.

However, the maximum tritium concentration measured in 2008 was 39,500,000 pCi/L and ten times greater than the expected maximum concentration. The high tritium concentrations measured in the 2008 samples is evidence of a new release of contamination from the wastes buried in the MWL dump.

Source: Figure 6-6 in *Investigation Report on the Soil-Vapor Volatile Organic Compounds, Tritium, and Radon Sampling at the Mixed Waste Landfill, August 2008*
SNL/NM Environmental Restoration Project

Figure 10. The proposed locations for three vadose zone monitoring wells and the three existing soil-moisture monitoring tubes at the Sandia MWL dump.

Note: The three proposed vertical vadose zone monitoring wells are MWL-VW1, MWL-VW2 and MWL-VW3. The three existing soil-moisture monitoring tubes installed at an angle below the MWL dump are MWL-VZ1, -VZ2 and -VZ3.

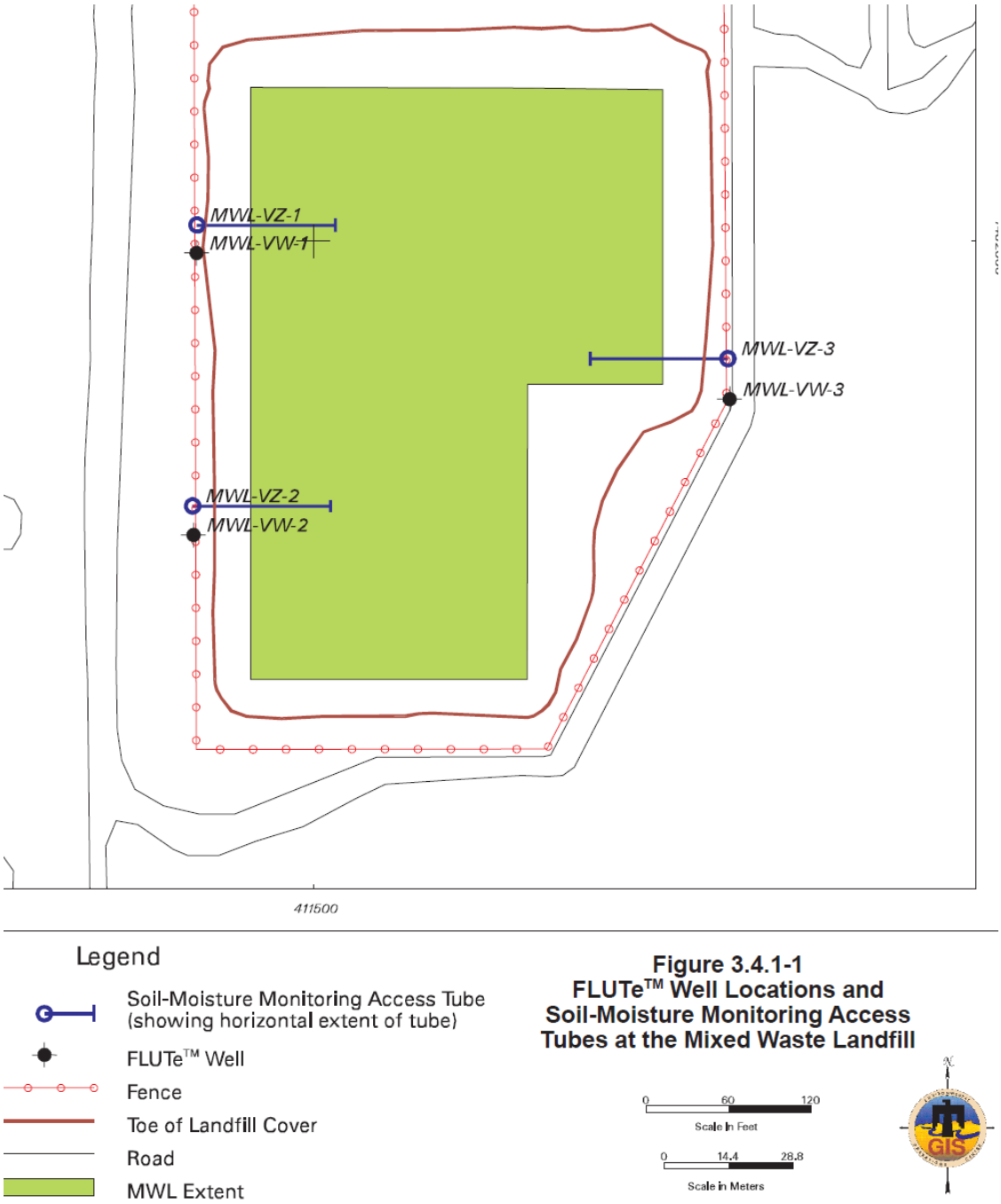


Figure 3.4.1-1
FLUTe™ Well Locations and Soil-Moisture Monitoring Access Tubes at the Mixed Waste Landfill

Source: Figure 3.4.1-1 in DOE/Sandia proposed *Long-Term Monitoring and Maintenance Plan, September 2007*

SECTION II—REGULATIONS GOVERNING THE MWL DUMP AND THE RELEASE OF CONTAMINATION TO GROUNDWATER

The New Mexico Environment Department (NMED) was delegated the Hazardous Waste Management program by the U.S. Environmental Protection Agency (EPA) beginning in January 25, 1985. NMED must maintain a hazardous waste program that is equivalent to, consistent with, and no less stringent that the Federal hazardous waste program known as the Resource Conservation and Recovery Act (RCRA). 42 U.S.C. §6901 et seq. The statutory intent of RCRA for hazardous waste management is "cradle to grave" and applies to generators, transporters, treatment, storage and disposal facilities.
The regulations for RCRA are contained in the Code of Federal Regulations 40 CFR §§260-282. http://www.epa.gov/osw/laws-regs/regs-haz.htm Public Participation requirements are at 40 CFR Part 124 and see also 63 Federal Register 56710 (October 22, 1988). RCRA is quite a complicated law to say the least.

The New Mexico Environment Department (NMED) was issued the authority from the U.S. Environmental Protection Agency to conduct the RCRA hazardous waste management program for New Mexico. The EPA retains statutory oversight responsibility for the state conduct of the RCRA program. (40 CFR §123.24).

As the Federal program changes, NMED must change its programs and ask the U.S. EPA to authorize the changes. Changes to state programs may be necessary when federal or state statutory or regulatory authority is modified or when certain other changes occur. NMED has adopted verbatim the regulations in the Code of Federal Regulations (CFR) for the program. NMAC 20.4.1.1 et seq. http://www.nmcpr.state.nm.us/nmac/parts/title20/20.004.0001.htm

The NMED hazardous waste regulations may be viewed at:
http://www.nmenv.state.nm.us/hwb/stareg.html.
Other requirements are contained in the April 29, 2005 Compliance Order on Consent http://www.nmenv.state.nm.us/hwb/SNL/Order_on_Consent/final/SNL_CONSENT_ORDER_April-29-2004_FINAL.pdf and the May 26, 2005 Final Order of NMED Secretary Ron Curry. http://www.nmenv.state.nm.us/hwb/SNL/MWL/Final_Decision/Final_Order_(05-26-2005).pdf. Taken collectively, the above and the following regulations govern the monitoring and releases from the Mixed Waste Landfill dump (MWL dump) along with providing requirements and opportunities for public participation:

- The Resource Conservation and Recovery Act ("RCRA")(42 USC 6901 et seq.) as amended, and the implementing EPA regulations at 40 Code of Federal Regulations Part 264 and 265 regulate the treatment, storage, transport and disposition of hazardous waste.
- RCRA provides for Corrective Action to include groundwater monitoring and clean up requirements in 40 CFR § 264.90-101 (Subpart F). RCRA Subpart F requires that networks of monitoring wells be installed in the "uppermost aquifer." The RCRA definitions of "aquifer" and "uppermost aquifer" are provided in 40 CFR § 260.10;
- The Class 3 Permit Modification to Module IV of the Sandia Hazardous and Solid Waste Act (HSWA) Permit requires permittee (SNL/DOE) to submit a Long Term Monitoring

and Maintenance Plan to the NMED within 180 days ***after*** the approval of the Corrective Measures Implementation Report. (P. 1-2 LTMMP).

- 40 CFR § 270.42 and Appendix I – Classification of Permit Modification-- section C. *Ground-Water Protection*, sections 1-8 thereto, provides that "changes in the number, location, depth, or design of upgradient or downgradient wells of permitted groundwater monitoring systems," "changes in point of compliance" are Class 2 Modification. "Replacement of an existing well that has been damaged or rendered inoperable, without change to location, design or depth of well" is a Class 1 Modification requiring public notification, review and comment. The changes to the MWL well monitoring network also constitute Class 2 modifications. For Class 2 Modifications, the permittee must submit a Modification request to the Director, notify persons, provide a comment period, provide a public meeting and other requirements. Appendix I, Section J.3, provides that addition or modification of a final cover constitutes a level 3 modification.
- **The April 29, 2004 Compliance Order on Consent** (Consent Order) contains Section IV.D for the MWL, Section VI provides the Corrective Action Process for the Mixed Waste Landfill dump. Section VII for Corrective Measures, Section VIII for Groundwater Monitoring Wells and Section IX for Groundwater. Section XI provides Compliance Schedule Tables for corrective action at the MWL dump. http://www.nmenv.state.nm.us/hwb/SNL/Order_on_Consent/final/SNL_CONSENT_ORDER_April-29-2004_FINAL.pdf
- **The 2005 Final Order of the NMED Secretary** provides for public participation as follows:

3. NMED and Sandia shall provide a convenient method for the public to review Sandia's Corrective Measures Implementation Plan, Corrective Measures Implementation Report, progress reports, long-term monitoring and maintenance plan, and any other major documents developed by NMED or Sandia for the MWL ("the documents"), including but not limited to, posting the documents on a publicly-accessible website.

4. NMED and Sandia shall provide a method and schedule that allows interested members of the public to review and comment on the documents, and NMED shall review, consider and respond to these public comments prior to approving any of these documents (with the exception of any documents, such as progress reports, that NMED does not approve in the normal course of permit review and oversight).

5. Sandia shall prepare a report every 5 years, re-evaluating the feasibility of excavation and analyzing the continued effectiveness of the selected remedy.
The report shall include a review of the documents, monitoring reports and any other pertinent data, and anything additional required by NMED. **In** each 5-year report, Sandia shall update the fate and transport model for the site with current data, and re-evaluate any likelihood of contaminants reaching groundwater.
Additionally, the report shall detail all efforts to ensure any future releases or movement of contaminants are detected and addressed well before any effect on groundwater or increased risk to public health or the environment. Sandia shall make the report and supporting information readily available to the public, before it is approved by NMED. NMED shall provide a process whereby members of the public may comment on the report and its conclusions, and shall respond to those comments in its final approval of the report.
http://www.nmenv.state.nm.us/hwb/SNL/MWL/Final_Decision/Final_Order_(05-26-2005).pdf

- RCRA permits, such as the Sandia RCRA Part B permit are subject to the conditions contained in a permit (including those in any attachments) and the applicable regulations contained in 40 CFR Parts 260 through 264, 270, and 124 as specified in the permit and statutory requirements of RCRA, as amended by the Hazardous and Solid Waste Act. The MWL dump is a part of the RCRA Part B permit listed as SWMU 76.
- 40 CFR §§ 270.30 (l)(11) and 20.4.1.900 NMAC require that NMED and DOE/Sandia have a duty to verify whether information is incorrect and to promptly submit correct information. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, it shall promptly submit such facts or information.
- 40 CFR §§ 270.41-270.43, 270.43(2) The permittee's failure to fully disclose all relevant facts in the application or during the permit issuance process, or the permittee's misrepresentation of any relevant facts *at any time* can be grounds for the termination, modification, revocation or reissuance of a RCRA permit).
- There are requirements for public participation in RCRA proceedings at 40 CFR § 124.5; 63 Fed. Reg. 56710 et seq. 63 Federal Register 56710, 56720 (October 22, 1998) sets out the requirements for public comment *throughout the cleanup process* including site characterization: "For example, the affected community should be notified and given the opportunity to comment prior to the initiation of any activity to assess contamination." Public participation is to take place "very early in the process" and "prior to the initiation of any activity to assess contamination or prior to the implementation of any interim measure."
- Department of Energy Orders – DOE O 450.1A and earlier 5820.2A

Pathways for administrative and court appeal

The authority to manage the RCRA program can be withdrawn from the NMED by the EPA. The NMED is required to meet certain standards of compliance for maintaining the RCRA program. There are criteria and procedures for withdrawal of the RCRA program from a state where substantive information is furnished to the EPA Regional Administrator that the program may no longer be adequate (40 CFR § 239.13 (2)(b)):

(a) The Regional Administrator may initiate withdrawal of a determination of adequacy when the Regional Administrator has reason to believe that: (1) A state no longer has an adequate permit program; or (2) The state no longer has adequate authority to administer and enforce an approved program in accordance with this part.

(b) Upon receipt of substantive information sufficient to indicate that a state program may no longer be adequate, the Regional Administrator shall inform the state in writing of the information.

The state RCRA program has requirements for compliance evaluation. 40 CFR 270.15. The state must encourage and maintain procedures for receiving and ensuring proper consideration of information submitted by the public about violations. The state program must verify the accuracy of information submitted by the permittee, i.e., Sandia National Laboratories, in reporting forms and other forms providing monitoring data. The state must verify the accuracy of sampling, monitoring, and other methods used by permittees and other persons to develop that information.

An administrative challenge may be brought against a State RCRA program with the EPA for failure to comply with program requirements. The criteria for withdrawing the approval of a State's RCRA programs provides as follows (40 CFR §271.22):

(a) The Administrator may withdraw program approval when a State program no longer complies with the requirements of this subpart, and the State fails to take corrective action. Such circumstances include the following: (1) When the State's legal authority no longer meets the requirements of this part, including: (i) Failure of the State to promulgate or enact new authorities when necessary; or (ii) Action by a State legislature or court striking down or limiting State authorities.

(2) When the operation of the State program fails to comply with the requirements of this part, including: (i) Failure to exercise control over activities required to be regulated under this part, including failure to issue permits; (ii) Repeated issuance of permits which do not conform to the requirements of this part; or (iii) Failure to comply with the public participation requirements of this part.

(3) When the State's enforcement program fails to comply with the requirements of this part, including: (i) Failure to act on violations of permits or other program requirements; (ii) Failure to seek adequate enforcement penalties or to collect administrative fines when imposed; or (iii) Failure to inspect and monitor activities subject to regulation.

(4) When the State program fails to comply with the terms of the Memorandum of Agreement required under §271.8.

40 CFR §271.23 provides that a petition can be filed by "an interested person" alleging the failure of the state to comply with the requirements of 40 CFR §271.22. The EPA Administrator may conduct an informal investigation of the allegations to determine if cause exists under §271.22 to commence proceedings. The EPA Administrator "shall respond in writing to any petition to commence withdrawal proceedings." The petitioner may receive a formal, on the record administrative hearing with an administrative law judge and the opportunity to present evidence. The procedures are provided in 40 CFR §22 and include representation by an attorney and discovery. Intervention may be allowed. The EPA Administrator makes a decision based on the recommendations of the hearing's Presiding Officer. The EPA Administrator can then list deficiencies in the State program for corrective action to be taken by the State. If corrective action is not taken by the State, the EPA Administrator may issue a supplementary order withdrawing approval of the program. The supplementary order is a final Agency action for judicial appeal under 5 U.S.C. § 704. If no supplementary order is issued, however, there would be no grounds for appeal.

A petition may be made to the Secretary of a State RCRA program. 40 CFR § 124.5 provides that "any interested person" may request the modification, revocation or termination of a RCRA permit for the reasons listed in 40 CFR § 270.41 or 270.43. Those regulations apply where the permittee fails in the application or during the permit issuance process to disclose fully all relevant facts, or the permittee misrepresents any relevant facts <u>at any time</u>. The Secretary can send a brief written response for a decision of denial. Denials of requests for modification, revocation and reissuance or termination are not subject to public notice, comment or hearings. [Note: No provision is made for an appeal of the denial.]

Citizen Suit for RCRA Violations is provided for by 42 U.S.C. §6972. §6972 subpart (a)(1)(A) states
any person may commence a civil action on his own behalf - (1)(A) against any person (including (a) the United States, and (b) any other governmental instrumentality or agency, to the extent permitted by the eleventh amendment to the Constitution) who is alleged to be in violation of any permit, standard, regulation, condition, requirement, prohibition, or order which has become effective pursuant to this chapter

§6972 subpart (a)(1)(B) states that any person may commence a civil action on his own behalf or:
"[A]gainst any person … and including any past or present generator, past or present transporter, or past or present owner or operator of a treatment, storage, or disposal facility, who has contributed or who is contributing to the past or present handling, storage, treatment, transportation, or disposal of any solid or hazardous waste which may present an imminent and substantial endangerment to health or the environment."

A RCRA Citizen Suit may be brought in the District Court where the violation or endangerment occurred. The plaintiff must give a 60 day notice for an (a)(1)(A) violation and a 90 day notice of an (a)(1)(B) violation to - (i) the EPA Administrator; (ii) the State in which the alleged violation occurs; and (iii) to any alleged violator of such permit, standard, regulation, condition, requirement, prohibition, or order.

Citizen Suits are injunctive and the costs of site investigation, monitoring and testing costs can be awarded. Costs, including attorney and expert fees, may be awarded to the prevailing or substantially prevailing party pursuant to 42 U.S.C. Section § 6972 (e):
The court may award costs of litigation (including reasonable attorney and expert witness fees) to the prevailing or substantially prevailing party, whenever the court determines such an award is appropriate.

After the 60 or 90 day notice period has expired, the United States Attorney General and Director of the EPA must be served with the Complaint where the claim is asserted pursuant to subsection (a)(1)(B).

The USEPA and the DOE both maintain an Office of Inspector General Hotline Compliant process for the public to report fraud, waste and abuse in agency operations and oversight. For EPA OIG:
http://www.epa.gov/oig/hotline.htm For DOE OIG: http://www.epa.gov/oig/hotline.htm

The Freedom of Information Act (FOIA) allows a person to obtain information from federal agencies. FOIA is codified at 5 U.S.C. Section 552. Each federal agency has a FOIA officer and the agencies have forms online that can be filled out. The FOIA applies to Executive Branch departments, agencies, and offices; federal regulatory agencies; and federal corporations. Congress, the federal courts, and parts of the Executive Office of the President that function

solely to advise and assist the President, are NOT subject to the FOIA. Records obtainable under the FOIA include all "agency records" - such as print documents, photographs, videos, maps, e-mail and electronic records - that were created or obtained by a Federal agency and are, at the time the request is filed, in that agency's possession and control. Nine different exemptions apply to The best place to get information about filing with an agency is on the agency's website. Fee waivers for the materials sought may be had under certain circumstances. Administrative and judicial review processes apply when requests are denied. Source: http://www.gwu.edu/~nsarchiv/nsa/foia/guide.html

The New Mexico Inspection of Public Records Act allows the public access to information about governmental affairs. The Act is codified at NMSA 1978, Chapter 14, Article 2. Further information: http://www.nmag.gov/pdf/AGO%20IPRA%20Guide.pdf; http://www.radfreenm.org/pages/foiaIndex.htm

SECTION III – THE DIRT COVER REMEDY CHOSEN FOR THE MWL DUMP IS INADEQUATE TO PROTECT HUMAN HEALTH AND THE ENVIRONMENT

A brief history of permitting reports for the MWL dump is as follows:

- In September 1990, Sandia/DOE published the Report of the Phase 2 RCRA Facility Investigation of the Mixed Waste Landfill.
- In September 1996, Sandia/DOE published the Report of the Mixed Waste Landfill Phase 2 RCRA Facility Investigation.
- In May 2003, Sandia/DOE published the MWL Corrective Measures Study. http://www.nmenv.state.nm.us/hwb/SNL/CMS/MWL_CMS_Final_Report.pdf
- In November 2005, Sandia/DOE published the MWL Corrective Measures Implementation Plan http://www.nmenv.state.nm.us/hwb/snlperm.html#CMIWP
- In November 2005, Sandia/DOE published the Long Term Monitoring and Maintenance Plan. http://www.nmenv.state.nm.us/hwb/snlperm.html#LTMandMPlan

[Note: the LTMMP was issued in advance of the Corrective Measures Implementation Report and must be reissued.]

- In January 2010, Sandia/DOE published the Corrective Measures Implementation Report. http://www.nmenv.state.nm.us/hwb/snlperm.html#MWLCMIReport
- The NMED sent Sandia/DOE a revised draft permit dated April 12, 2011, but did not provide notice to the public about the revised draft permit being sent to Sandia/DOE. The revised draft permit is not referenced or available on the main NMED website. ftp://ftp.nmenv.state.nm.us/hwbdocs/HWB/snl/SNL_Revised_Draft_Permit/

The New Mexico Environment Department (NMED), Sandia Labs and DOE's remedy decision for the MWL dump has been limited to the installation of a dirt cover over the wastes, Long-term Maintenance and Monitoring and Stewardship. Earlier information about defective groundwater monitoring wells that provided unreliable and unrepresentative data for the decision to leave the radioactive and hazardous mixed waste in the MWL was not included in the above reports. There were numerous internal documents of the Department of Energy, the NMED, the US EPA, and Los Alamos National Laboratory that contained

information about the MWL dump's groundwater monitoring network that did not meet state and federal regulatory standards for groundwater monitoring.

Regulatory History
In 1998 a decision was made by NMED to treat the MWL dump as a Solid Waste Management Unit ("SWMU") rather than as a "regulated unit." The DOE/Sandia annual groundwater report describes the requirements for RCRA Corrective Action as follows:
2.0 REGULATORY CRITERIA
Historically, the NMED Hazardous Waste Bureau has provided regulatory oversight of the MWL as Solid Waste Management Unit (SWMU) 76 under the Hazardous and Solid Waste Amendments module of the facility Resource Conservation and Recovery Act [RCRA] permit. The NMED confirmed that the MWL is properly designated as a SWMU (Dinwiddie June 1998) and, as such, must comply with the corrective action program defined in Title 20, New Mexico Administrative Code, Section 4.1.500, incorporating Title 40, Code of Federal Regulations, Section § 264.101. The requirements for corrective action at the MWL, including those for groundwater monitoring, are established through the corrective measures process (p. 2-1).

The MWL dump is actually a "regulated unit" by definition because it received hazardous waste after July 26, 1982. (40 CFR § 264.90(a). In the author's opinion, the MWL dump has been improperly classified as a Solid Waste Management Unit (SWMU) for closure under Corrective Action. Special requirements for closure and post-closure permits apply to regulated units especially where the regulate unit is leaving wastes in place. 40 CFR §270.1 (c) requires that owners and operators of landfills that received waste after July 26, 1982 must have post-closure permits, unless they demonstrate closure by removal or decontamination or obtain an enforceable document in lieu of a post-closure permit. If a post-closure permit is required, the permit must address groundwater monitoring, unsaturated zone monitoring, corrective action and post closure care requirements. No post closure permit has been submitted for the MWL dump which is leaving wastes in place.

The 2004 Consent Order does not constitute an enforceable document to be used "in lieu of" a post closure permit for the MWL dump. The Consent Order provides that its use is limited to corrective action and that the closure and post-closure requirements of 40 CFR Part 264, Subpart G [40 CFR §264.118 et seq.] for operating units will be addressed in the future Hazardous Waste Facility Permit and not in the Consent Order. (Consent Order III.W.1(2), p.33). The Consent Order precludes itself from being used in lieu of the closure and post closure requirements.

The Consent Order (p.4) states that the MWL is an un-permitted landfill. Thus by its own terms the Consent Order does not constitute a substitution for a RCRA permit for the MWL. A valid RCRA permit consists of a Part A application and a Part B final permit. (40 CFR 270.1(b)). The purposes and scope of the Consent Order encompass only those of corrective action.

The Consent Order does not address radionuclides or the radioactive portion of mixed waste. (III.A, p.14). DOE Orders 435 (Performance/Composite Analysis), 450.1 (Environmental Management System), and 5400.5. Radionuclides disposed of at the MWL dump have not been adequately addressed.

Transuranic Waste (TRU)—the SWIMS database indicates that about 50 cu ft of TRU waste containing 1.2 mCi of total activity was disposed of at the MWL. Memoranda and Waste Management Site Plans from the early 1970s indicate that the amount of TRU waste could be as high as 600 cu ft. The major contaminants included in this waste category are Pu-238 and Pu-239. (A Preliminary Human Health Risk Assessment for the Mixed Waste Landfill, Sandia National Laboratories, 1995, p. 12)
http://www.nmenv.state.nm.us/hwb/SNL/MWL/Preliminary_Human_Health_Risk_Assess_MWL_by_Johnson(1-1995).pdf

Pu-238 and Pu-239 in the surface run-off pathways away from the MWL dump were not investigated. With a half-life of 87.7 years for Pu-238 and 24,100 years for Pu-239, both of these contaminants should be of concern along the surface soil pathway.

Characterization was not done with the surface soil samples for plutonium as required in the Work Plan at the Mixed Waste Landfill during the RCRA Facility Investigations (RFI) Phase 1 and Phase 2. The Phase 1 *Work Plan for an Expanded Site Assessment at the Mixed Waste Landfill* (July 1989) by Ecology and Environment, Inc., (Table 3-2, p. 3-11) stated 197 surface soil samples were to be collected for Tritium, Gross Beta, Gamma Spectrometry, Isotopic-Uranium, and Strontium 90 if gross beta and the gamma isotopic scan indicate its presence.

The number of surface soil samples collected did not meet the 1989 Work Plan requirements and many samples were lost. The Phase 1 Report (p.3-24) states:
"A total of 164 surface soil samples including duplicates and blanks were collected at the MWL. The workplan specified the collection of 182 samples. Samples could not be collected where surface obstacles prevented access (i.e., above ground storage casks, disposal pits and associated concrete, steel, or wood caps, unyielding ground), *or near areas of excessively high radiation marked areas (previously roped off by SNL).* Originally, all of the samples were to be analyzed for tritium, gross beta activity, gamma emitters (gamma spectroscopy), isotopic uranium, and isotopic plutonium. Ten Percent of the samples (randomly selected) were analyzed to determine if the radiological parameters could be determined. *The remainder of the samples were lost by the laboratory.* The actual analyses were for tritium, gross beta activity, gross alpha activity, gamma emitters, and isotopic uranium." (Emphasis added).

On the contrary, however, The RFI Phase 1 Report at Table 5-6 (p. 5-11) shows that gamma emitters were not analyzed. In addition, the analytic results for gamma emitters are not presented anywhere in the RFI Phase 1 or Phase 2 Reports.

This statement is an indication that high levels of surface soil contamination were present and were not characterized for plutonium and many other contaminants, especially given the fact that only ten samples were analyzed. The ten samples, moreover, did not analyze for nuclear weapons related contaminants other than tritium, Ra-226, U-234, and U-238 (Table 5-6, p. 5-11).

None of the later sampling in the RFI Phase 2 looked for plutonium or other radionuclides, with the exception of tritium. Plutonium was detected in the surface soils from a limited study of the closure of an Interim Status Storage Unit. (Also, see below). The gamma isotopic scan was not performed as required by the RCRA Phase 1 Workplan. The Phase 1 Report (p.3-25 and Table

3-4) showed that the Workplan activity for Surface Soil Sampling was for -- "182 Samples to be collected for analyses for Tritium, Gross Beta, Gamma Spectrometry, Isotopic-Uranium , and Isotopic Plutonium. 100% Analysis of samples." The Completed work was -- "164 samples collected for Analyses for Tritium, Gross Alpha/Beta activity, Gamma Spectrometry, and Isotopic Uranium. Iso-Plutonium only if elevated gamma readings noted. Only 10% analyzed in 1989. Remainder to be analyzed in Phase II."
The remaining 90% of the samples were supposed to be analyzed in Phase 2. Apparently the laboratory lost the samples. (See fn 1). In the Phase 2 (p. 4-29) surface soil sampling, however, there is indication only that surface soil samples were collected for tritium. The remaining analysis of Phase 1 sampling was apparently not accomplished.

The failure to accomplish the RCRA Workplan for Phase 1 and 2 gives no confidence that soil surface contamination from plutonium or other radionuclides does not exist because only 10 samples were actually analyzed and for a limited analytical suite.

Failure to conduct adequate surface soil sampling precluded risk analysis for both the surface runoff pathway and for airborne emissions inhalation pathway. The *Preliminary Human Health Risk Assessment for the Mixed Waste Landfill, Sandia National Laboratories, Albuquerque, New Mexico* (January 1995) was based on the limited and insufficient data from the RFI phase 1 and 2 surface soil sampling. "No surface soil sampling was performed during the RCRA Facility Investigations Phase 1 and Phase 2 for RCRA heavy metals." (P.9). (http://www.nmenv.state.nm.us/hwb/SNL/MWL/Preliminary_Human_Health_Risk_Assess_MWL_by_Johnson(1-1995).pdf)

The 1995 Risk Assessment states further: "In addition, the lack of surface soil data precludes modeling the potential airborne emissions from the site. The potential pathways of concern for the future resident include inhalation and absorption of tritium, external radiation, and ingestion of groundwater. Inhalation of radioactive air particulates was not assessed for the same reason as for the worker scenario. Incidental ingestion of soil, and ingestion of contaminated food also were not assessed *because surface soil data have not been collected*." (Emphasis supplied).

The RFI Phase 2 Report (p.7-6) states "Surface soil sampling for radionuclides showed all values to be below the 95th percentile or UTL background level, with the exception of tritium." However, the only data presented in the Phase 1 and 2 reports is from 10 samples that did not adequately characterize for radionuclides other than tritium.

The DOE/Sandia has installed a dirt cover over the MWL dump wastes. Long-term monitoring and maintenance and stewardship have yet to be approved or implemented.

Dirt Cover. In December 2004 a public hearing was held for the NMED recommendation to leave the toxic wastes buried in unlined trenches and pits at the Sandia MWL dump below a dirt cover (Pruett, 2005). On May 26, 2005 NMED Secretary Ron Curry issued a Final Order approving a Corrective Measures Implementation Plan (CMIP) for the installation of dirt cover over the Sandia MWL dump to keep rain and moisture out.
http://www.nmenv.state.nm.us/hwb/SNL/MWL/Final_Decision/Final_Order_(05-26-2005).pdf

The dirt cover is an experimental 3-ft. layer of soil called an "evapo-transpirative" cap that was installed by running heavy compaction equipment above the dump wastes. This simply means that any excess water will be evaporated using native vegetation that will take up moisture through their roots and suck it away from the landfill into the air. A fiber optic system will be installed in the soil layer in a snake-like fashion to measure the moisture in the soil. In the event subsidence occurs—the settling or caving in of soil due to underground air pockets—it will simply be taken care of by throwing more dirt on top of the cap. Air pockets can form as a result of un-compacted waste dumped into the landfill. Subsidence can also result from decreasing water levels in the aquifer and earthquakes.

Although a dirt cover has been placed over the dump, it will not be effective for long term protection of the long lived wastes in the dump that can enter air and water. The New Mexico Environment Department sued Citizen Action to keep a 2006 TechLaw, Inc. report **secret** until late 2009. The TechLaw report reveals flaws in the dirt cover construction for long term protection and rejects Sandia's computer modeling for movement of the dump's wastes. The TechLaw, Inc. report can be viewed at:
http://www.radfreenm.org/pages/SecretDocuments/sd-2006jan31a.pdf

In January 2010 a Corrective Measures Implementation Report ("CMI Report") regarding the details of completion of the installation of the dirt cover was provided to NMED by Sandia. ftp://ftp.nmenv.state.nm.us/hwbdocs/HWB/snl/Mixed_waste_landfill/MWL_CMI_Report_1-26-2010/

Citizen Action furnished comments on the CMI Report that may be reviewed at:
http://www.radfreenm.org/pages/GroundWaterProtection/20110217CaCommentsCmiReport.pdf
The cover is ineffective. Dangerous wastes have already begun to enter the groundwater. Nickel, chromium, cadmium and nitrates appeared in older defective monitoring wells that were installed decades ago.

Solvents were placed in the MWL dump. Solvents can dissolve other waste substances found in the MWL dump and form a uniformly dispersed mixture.
"Chemical wastes include acids, solvents, trichloroehylene (TCE), carbon tetrachloride, and scintillation cocktails. Other wastes disposed of in the classified area include uranium, thorium, plutonium, enriched lithium, various (leaky and intact) sources, plutonium-contaminated wastes from various facilities, and plutonium-contaminated nuclear weapons test debris." - Appendix D, SNL Site Health and Safety Plan Form, 1992 (FOIA 116).
"Chemicals contaminated with radioactive materials were disposed of in the radioactive acid pit is pit until about 1969. Contaminated chemicals included solvents, acids, trichloroethylene and carbon tetrachloride." - Interview with former SNL employee Frank Statzula (FOIA 58).

Soil vapor studies conducted in 2007 show that cancer causing volatile organic solvents are moving deeper beneath the MWL dump. DOE/Sandia computer studies in 1995 and 2007 predicted the groundwater is contaminated now with PCE. The same type of solvent wastes

found in the MWL dump such as TCE and PCE were placed in the Chemical Waste Landfill dump, contaminated the groundwater and had to be excavated.

The presence of the dirt cover can actually accelerate the movement of solvents to the groundwater. "However, it is ironic that a cover that is effective in minimizing soil moisture in the landfill can also contribute to an increase in vapor phase transport of volatiles such as tritium." (Review of Sandia National Laboratories/New Mexico Evapotranspiration Cap Closure Plans for the Mixed Waste Landfill by Tom Hakonson, Ph.D., Environmental Evaluation Services, LLC).

http://www.radfreenm.org/pages/hakonson_full.htm Hakonson addresses other problems for dirt covers:
"Buried waste can be mobilized to the ground surface through plant roots and animals and insect burrowing can dramatically increase infiltration of water into landfill with covers as thick as those proposed;
"Vertical transport of contaminants to the ground surface by biota may be small on a short time scale, but over many decades these processes may become dominant in mobilizing buried waste;
" The long-term consequences of biointrusion into low level waste landfills located in arid areas estimated that doses to humans resulting from biological transport were as high as doses calculated from a human intrusion scenario (Pacific Northwest Laboratory).

Long-term monitoring. In addition to monitoring the ground water at the MWL dump, Sandia installed three angled holes drilled to a depth of 200 ft. on the east and west sides of the landfill. Probes inserted in the boreholes are supposed to monitor the area of unsaturated soil located between the surface and the ground water called the vadose zone. The vadose zone monitoring proposed in the DOE/Sandia Long-Term Monitoring and Maintenance Plan is inadequate because the three vadose zone monitoring wells are too few and are located distant from the hot spots in the MWL dump. Unfortunately, the NMED HWB has not required vadose zone monitoring beneath the unlined trenches and pits at the MWL dump.

A network of seven groundwater monitoring wells are proposed for long term monitoring. As discussed below, the proposed groundwater monitoring wells are defective and did not furnish evidence of no contamination to the groundwater. The data furnished from the groundwater monitoring network did not furnish a factual basis for leaving the wastes under a dirt cover.

The Sandia Long Term Monitoring and Maintenance Plan (LTMMP) preceded the issuance of the Corrective Measures Implementation Report for the MWL dump. The LTMMP is required to be submitted within 180 days *after* the NMED approval of the CMI Report. For this reason the LTMMP will need to be resubmitted for public comment.
http://www.nmenv.state.nm.us/hwb/documents/1-31-2008_Citizen_Action_Comments.pdf

Stewardship. Stewardship is a term conceived by DOE that means instead of cleaning up contaminated sites, DOE will utilize physical and institutional controls - signs, fences, buffer zones, zoning ordinances, land use restrictions, environmental covenants, record-keeping, access control, surveillance - and other activities necessary to "protect human health and the

environment at DOE sites that have residual waste or contamination" (DOE Report To Congress On Long-Term Stewardship p.1-2).

The period of stewardship for the MWL set by regulation is only for a period of 30 years. The MWL dump wastes will remain dangerous for tens of thousands of years due to the presence of transuranics such as depleted uranium, plutonium and americium. There are no long term trust funds in place for financial assurance for care the MWL dump. Sandia is treated as exempt from requirements for closure and post closure care financial assurance requirements.

RCRA requires that a landfill be closed by clean closure by decontamination and removal of wastes. If wastes are to be left in place a closure and post-closure permit are required or an enforceable document must be obtained. As described below, no closure/post-closure permit exists for the MWL dump.

Industrial land use. Sandia and DOE's long-term plan for the dump is to impose land use restrictions and designate the dump for industrial usage. This means that residential housing will not be allowed at the area of the dump; however, if the landfill is approved for industrial use people will be spending less time around the dump decreasing their chances of contracting cancer. The NMED has approved this method of dealing with waste sites.

A problem arises from the potential future intermingling of land for residential housing with land allowed for restricted industrial use. Allowing the degradation of the drinking water aquifer to an industrial standard where the groundwater will be used for residential usage creates a conflict.

SECTION IV -- THE DIRT COVER REMEDY IMPLEMENTED BY SANDIA NATIONAL LABORATORIES AND APPROVED BY THE NEW MEXICO ENVIRONMENT DEPARTMENT IS INADEQUATE TO PROTECT THE ENVIRONMENT AND DOES NOT MEET REGULATORY REQUIREMENTS

1. **The description of the Sandia MWL as a "landfill" in reports by DOE/Sandia and NMED is incorrect and misleading**. A landfill is an engineered facility that has liners, leachate detection and leachate removal capabilities. 40 CFR 264.301. The MWL has none of these engineered features. In fact, the Sandia MWL dump was named the "TA-3 low-level radioactive waste dump" during the 30 years of waste burial operations from March 1959 through December 1988.

An example of the mischaracterization of the MWL functions as a landfill in testimony by DOE staff person, Mr. John Gould, at the NMED December 2004 Public Hearing. Mr. Gould stated: "Landfills have a purpose. The purpose of landfills is to contain waste and isolate it to prevent impacts on human health and the environment (Transcript, v. I, p. 34, l.17, 18 & 19).

The historical record shows that the design and operation of the Sandia "mixed waste landfill" is as a dump with the wastes haphazardly buried in unlined pits and trenches. Wastes were often not inventoried and were randomly cast into the dump in paper cartons, plastic bags and wooden crates. http://www.radfreenm.org/pages/frameset-mwfmap.htm DOE/Sandia and the NMED have not recognized that the monitoring well data show the release of wastes buried in the MWL

dump have contaminated the groundwater. Cadmium, chromium, nickel and nitrate were found. In addition, the DOE/Sandia computer modeling studies in 1995 and 2007 identified that the wastes released from the MWL dump may have contaminated the groundwater with the highly toxic solvent tetrachloroethene (PCE).

2. **The wastes in the MWL dump were not adequately characterized**. For example, Comment Responses to USEPA Notice of Deficiency (November 1994) stated:
Comment 6 Response: "Hazardous constituents which may have been disposed of at the MWL include lead shielding, barium, beryllium, and chromium, as well as organic wastes containing TCE, carbon tetrachloride, organic acids, and toluene-based scintillation cocktails.
"The actual concentrations and quantities of hazardous wastes disposed of at the MWL are unknown, and may never be known. Unfortunately, many of the records on the wastes disposed of at the landfill have been purged, and the existing records contain limited information on the quantities, concentrations, and location(s) of hazardous constituents disposed of at the MWL." (Administrative Record AR 06511).

3. There is great uncertainty in the amount and type of wastes buried in the Sandia MWL dump. At the MWL dump, a large and poorly documented inventory of commingled hazardous wastes, low-level radioactive wastes, and mixed wastes (i.e., radioactive wastes with a component of hazardous wastes) were carelessly buried in unlined trenches and pits. (See Figures 3, 4 and 5). The contradictory information on the total quantity of wastes buried in the MWL dump ranges from 100,000 cubic feet to greater than 780,000 cubic feet and up to 1,500,000 cubic feet. The NMED April 29, 2004 Compliance Order on Consent (Consent Order) lists the hazardous wastes buried in the MWL dump to "include acids, metals, organic solvents and other organic compounds" (p. 43). The solvents include in part cancer and disease causing tetrachloroethene (PCE), trichloroethene (TCE) and dichlorodifluoromethane (CFC-12). The metals include in part beryllium, cadmium, chromium, nickel and lead.

The DOE/Sandia 2007 fate and transport computer model (FTM) Report 2 lists the radioactive wastes buried in the MWL dump to include in part amercium-241, cesium-137, cobalt-60, plutonium-238, plutonium-239, radium-226, radon-222, strontium-90, thorium-232, tritium and uranium-238 (p.3).

4. The poorly managed disposal and maintenance practices at the Sandia MWL dump allowed a large amount of water to enter the buried wastes. In 1967, 271,000 gallons of reactor coolant water was disposed in Trench D. FOIA documents reveal a DU fire occurred at the MWL in 1974. The precipitation and uncontrolled surface water flows onto the MWL dump introduced a large and unknown amount of water into the buried wastes increasing the likelihood of contaminant transport to the groundwater. There was poor control of precipitation and surface water run-in to the wastes dumped into the unlined trenches and pits 1). during the 30 years of disposal operations from March 1959 through December 1988 and 2). during the 18 years from 1989 to 2006.

The annual amount of precipitation that fell on the MWL dump was 8.5 inches. The poor control of water entering the buried wastes at the MWL dump is illustrated by a memorandum dated

November 20, 1996 from Sandia staff person Mr. Jerry Peace to DOE staff person Mr. John Gould. The pertinent excerpt from the memo follows:
Pit caps in the classified area [of the MWL dump] 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 [Emphasis supplied]. These caps have collapsed because backfilled soils have settled over time, leaving a void directly beneath the concrete or plywood cap.

In 2006, berms were installed around the perimeter of the Sandia MWL dump to prevent surface water from rain storms from flowing on to the MWL dump during the installation of the subgrade layer of compacted dirt over the surface of the MWL dump. Citizen Action used the Freedom of Information Act (FOIA) process to obtain Stormwater Pollution Prevention Plan Inspection and Maintenance Report Forms that document the berms installed around the MWL dump were breached on August 16, 2006 by a rain storm. The Stormwater Form dated August 16, 2006 stated :
Major rain event exceeded design criteria [for the berms]. Berms breached on east and west side. Three breaches on west side [of MWL dump]. Minor breaches on east side. Little ponding remains.
The surface water flows from rain storms breached the berms and flowed onto the MWL dump. The large volume of surface water that flowed onto the MWL dump in 2006 during the construction of the subgrade layer shows that large volumes of surface water were allowed to flow onto the MWL dump for 50 years from 1959 to 2006.

5. The NMED decision in 2005 to leave the commingled hazardous, mixed and radioactive wastes in place below a dirt cover was based on unreliable data from defective groundwater monitoring wells. The data came from a network of groundwater monitoring wells that were described by government scientists as being in the wrong locations, insufficient in number and not in compliance with RCRA.

The minimum requirement in RCRA is for a network of three downgradient contaminant detection monitoring wells and one upgradient background water quality monitoring well. The first four monitoring wells installed in 1988 and 1989 at the Sandia MWL dump (i.e., wells MWL-MW1, -MW2, -MW3 and -BW1) were installed at the wrong locations. (See, http://www.nmenv.state.nm.us/hwb/SNL/SNL_3-23-2007_Replacement_of_MWL_Mon_Well_BW1.pdf -- replace BW1 to the east and more directly upgradient of the MWL, consistent with normal practice for installation of background wells. The incorrect assumption had been made that the direction of groundwater flow at the water table below the MWL dump was to the northwest. (See Figure 8). (See http://www.nmenv.state.nm.us/hwb/documents/7-2-2007_NMED_SNL_Require_Replacement_MWL_Wells_MW1_and_MW3.pdf -- recognizing that groundwater flows west-southwest). The reports below show that it was conclusively recognized beginning in 1991 that the direction of groundwater flow below and downgradient from the MWL dump was to the south or southwest. This meant that monitoring well MWL-MW3 was the only downgradient monitoring well and that no upgradient background monitoring

well existed. But the only downgradient well MWL-MW3 did not produce reliable and representative water samples for other factors.

Nevertheless, DOE/Sandia continued to offer data and NMED continued to accept data from the improperly positioned wells for decision making up to the present.

The reports describing the defective groundwater monitoring wells were issued during the period from 1991 to 1998 by scientists from the DOE Tiger Team, Los Alamos National Laboratory, NMED and the U.S. Environmental Protection Agency (EPA). Four of the reports that described the requirement to replace all of the seven monitoring wells installed at the MWL dump over the period 1988 to 2007 are summarized here:

- The Los Alamos National Laboratory (LANL) wrote a report in 1991 (Rea, 1991) that described the southwest direction of the groundwater flow and the failure of the monitoring well network at the Sandia MWL dump to be in compliance with RCRA. The LANL report stated:

It is stated that "three additional wells were installed, two downgradient and one upgradient…" It would be appropriate to mention here that the data from these [four] wells indicated that the network has in fact only one downgradient well [i.e., well MWL-MW3] and no wells that are definitely upgradient.

The data from the present monitoring well network indicates that there is only one downgradient and no upgradient wells. This in itself establishes the inadequacy (under RCRA) of the present well network.

- **A 1993 NMED report by NMED staff Mr. Will Moats and Ms. Lee Winn (Moats and Winn, 1993)** describes the fact that the direction of groundwater flow at the water table below the MWL dump was to the south or southwest rather than the northwest. This made the monitoring well network "inadequate" as follows:

The hydrogeologic conditions at the MWL have not been adequately characterized. . . Water level data from July 1992 indicate south-directed or southwest directed flow. However, the gradient and direction of ground-water flow are not known with reasonable certainty (p. 3).

The detection monitoring system that currently exists at the MWL is inadequate because the direction and speed of ground-water flow can not be determined with reasonable certainty (p.7).
The 2008 DOE/Sandia Report continued the mistake that the direction of groundwater flow at the water table below the MWL dump is to the *northwest even after the NMED HWB issued a letter on July 2, 2007 that the direction of groundwater flow was to the southwest*.

- **The Environmental Protection Agency (EPA) Region 6 issued a Notice of Deficiency (NOD) Report on September 22, 1994 (EPA, 1994) for the March 1993 DOE/Sandia Phase 2 RCRA Facility Investigation (RFI) Work Plan for the Sandia MWL dump.** Despite the EPA 1994 NOD Report, DOE/Sandia described the defective and unreliable monitoring well network at the Sandia MWL dump as a reliable network of monitoring wells in the 1996 Phase 2 RCRA Facility Investigation (RFI) Report. **T**he 1994 EPA Region 6 NOD Report rejected the DOE/Sandia description of a reliable network of monitoring wells in the following pertinent excerpt:

Comment no. 11. On page 2-31 [in the RFI Work Plan], the third paragraph states that regional potentiometric maps indicate that the hydraulic gradient at the MWL is toward

the west and northwest. As shown in Figure 2-21, the MWL monitoring well network (i.e., MWL-BW1, MWL-MW1, MWL-MW2, and MWL-MW3) has been installed based on the assumed regional hydraulic gradient. However, the third paragraph further continues to state water level data collected from the MWL monitoring wells suggests the hydraulic gradient is to the southwest (p.5).
Based on the southwest gradient flow of groundwater, the MWL monitoring wells are located cross gradient instead of downgradient from the MWL; therefore, contaminants emanating from the MWL may not be detected in the monitoring wells.

The EPA 1994 NOD Report presented findings that the monitoring well network installed at the MWL dump was not reliable to detect groundwater contamination from the wastes buried in the dump. However, the network of monitoring wells was not improved at any time from the network identified as unreliable in the EPA 1994 NOD Report and in the earlier reports by LANL (REA, 1991) and the NMED HWB (Moats and Winn, 1993).

- **In 1998 the NMED HWB issued a Notice of Deficiency (NOD) Report for the 1996 DOE/Sandia Phase 2 RCRA Facility Investigation (RFI) Report.** The NMED 1998 NOD Report described the overall failure of DOE/Sandia to install a reliable network of monitoring wells at the Sandia MWL dump. The NMED 1998 NOD Report (Garcia, 1998) identified the following five deficiencies with the 1996 Phase 2 RCRA Facility Investigation (RFI) Report for groundwater protection at the MWL dump:

#1 deficiency. Well MWL-MW3 was the only downgradient monitoring well. The pertinent excerpt from the 1998 NMED NOD Report follows:
The water-table map indicated that there is only one downgradient monitor well at the Mixed Waste Landfill [i.e., well MWL-MW3]. Normally, a minimum of three downgradient wells is required for an adequate detection monitoring system.
The 1998 NMED NOD Report required DOE/Sandia to install two new monitoring wells west of the MWL dump with the well screens installed across the water table in the fine-grained alluvial fan sediments. Accordingly, wells MWL-MW5 and -MW6 were installed west of the MWL dump in 2000. However, the geologic cross-section in Figure 6 shows that the screens in the two monitoring wells were installed too deep for the intended purpose to monitor at the water table in the fine-grained alluvial fan sediments.
The NMED Hazardous Waste Bureau (HWB) has not, but should require replacement of the unreliable monitoring wells as is required by the April 29, 2004 Consent Order (p.63) for monitoring wells that do not serve their intended purpose. Figure 7 shows that the two unreliable monitoring wells MWL-MW5 and -MW6 are in the current network of monitoring wells. In addition, DOE/Sandia proposes to use the two unreliable monitoring wells that do not allow accurate assessment of groundwater contamination in the long-term monitoring and maintenance plan for the MWL dump (DOE/Sandia, 2007).

#2 deficiency. The upper screen in the onsite monitoring well MWL-MW4 was installed too deep below the water table for the well to measure the elevation of the water table or detect groundwater contamination at the water table. The pertinent excerpts from the 1998 NMED NOD Report follow:
The top of the upper screen of MWL-MW4 is located approximately 22 ft below the water table. Because of the vertical gradient and the way the well is constructed, MWL-MW4 is of no value

for determining the elevation of the water table (and therefore, the horizontal direction of ground-water flow and the horizontal gradient.
Also, because the top of the upper screen of MWL-MW4 is located 22 ft. below the water table, the well is of little value for detecting any groundwater contamination (if any exists) that may be present in the saturated zone just below the water table.
The installation of the upper screen in well MWL-MW4 too deep below the water table is displayed on Figure 6. The NMED has not, but should require replacement of the defective monitoring well. Many DOE/Sandia reports present the unreliable water quality data collected from the defective well MWL-MW4 for the incorrect conclusion that the MWL dump has not contaminated the groundwater below the Sandia MWL dump.

#3 deficiency. The NMED 1998 NOD Report required DOE/Sandia to prove on a technical basis that the high nickel concentrations measured in the groundwater samples collected from monitoring wells MWL-MW1 and -MW3 were only from the corrosion of the stainless steel well screens as follows:
DOE/SNL must support their position on a technical basis that the elevated nickel levels detected in groundwater samples from monitor well MWL-MW1 (and MWL-MW3) are a result of the corrosion of 304 stainless steel well screen; otherwise, such elevated levels of nickel will be attributed to a release of contaminants from the landfill.
DOE/Sandia did not prove that the high nickel concentrations in the groundwater samples collected from monitoring wells MWL-MW1 and -MW3 were not from the nickel wastes buried in the MWL dump. DOE/Sandia continued the incorrect assumption and unproven conclusion that the high concentrations of dissolved nickel were only from corrosion of the stainless steel well screens.

The nickel concentrations measured in the groundwater samples collected from the four monitoring wells at the MWL dump that had stainless steel screens are listed in Table ES-2 that can be found at p. 29
http://www.radfreenm.org/pages/GroundWaterProtection/SANDIA_MWL_DUMP_EXECUTIVE_SUMMARY.pdf. The nickel data in Table ES-2 show the remarkably high dissolved nickel concentrations measured in the groundwater samples collected from the contaminant detection monitoring wells MWL-MW1 and -MW3 located close to the MWL dump compared to the low dissolved nickel concentrations measured in the groundwater samples collected from the two background monitoring wells MWL-BW1 and -MW2 located distant from the MWL dump.

The high dissolved nickel concentrations measured in the groundwater samples collected from monitoring wells MWL-MW1 and -MW3 are statistically significant evidence under RCRA criteria of groundwater contamination from the nickel wastes buried in the unlined pits and trenches at the Sandia MWL dump.

Table ES-2 shows the high dissolved nickel concentrations measured in the first groundwater samples collected from monitoring well MWL-MW1 in the early 1990s before the assumed onset of corrosion in the stainless steel well screens beginning in 1992 (Pruett, 2005). RCRA requires replacement of monitoring wells with corroded screens that prevent reliable detection of contamination.

The NMED HWB continued acceptance of the unreliable data that were not in compliance with RCRA and the NMED Consent Order up to the DOE/Sandia Report issued in 2008. The NMED HWB did not require replacement of the unreliable monitoring wells MWL-MW1 and -MW3 until a letter issued by NMED HWB Chief James Bearzi on July 2, 2007 as follows:
Additionally, both wells are also constructed with stainless steel screens, which are suffering corrosion to such a degree that the wells can no longer produce water samples that are representative of aquifer conditions for chromium, iron, and nickel.
In fact, the NMED knew in 1992 that the two corroded monitoring wells MWL-MW1 and -MW3 did not produce reliable and representative groundwater samples for detection of chromium, nickel, other RCRA metals and many radionuclides including americium and plutonium. Nevertheless, NMED relied on 12 years of data from the unreliable monitoring wells to recommend leaving the MWL dump wastes buried below a dirt cover. This is shown by Finding of Fact 81 in the Hearing Officer's Report (Pruett, 2005) as follows:
81. Elevated levels of nickel and chromium have been detected since 1992 in MWL-MW1, MWL-MW2, MWL-MW3 and MWL-BW1, which wells are all constructed with stainless steel well screens. NMED attributes these elevated levels to corrosion of the stainless steel well screens.

There are four issues in Finding of Fact 81:
- First, DOE/Sandia did not provide a technical basis for the incorrect assumption that the elevated levels of nickel measured in groundwater samples collected from wells MWL-MW1 and -MW3 were only from corrosion. Therefore, the NMED 1998 NOD Report attributed the elevated levels of nickel in the water samples collected from the two wells to groundwater contamination from the wastes buried in the MWL dump.
- Second, the very low median dissolved nickel concentration of 1.2 ug/L measured in the groundwater samples collected from the new background monitoring well MWL-BW2 DOE/Sandia, 2009, 2010) satisfy RCRA criteria that the high dissolved nickel concentrations measured beginning in the early 1990s from monitoring wells MWL-MW1 and -MW3 are evidence of nickel groundwater contamination from the wastes buried in the MWL dump.
- Third, beginning with the first water samples collected in 1990, RCRA criteria identified that the elevated levels of cadmium, chromium, nickel and nitrate in the water samples collected from wells MWL-MW1 and -MW3 compared to the low or not detected concentrations in the background monitoring well MWL-BW1 as evidence of groundwater contamination from the wastes buried in the MWL dump. DOE/Sandia and the NMED HWB claim that the septic systems in TA-3 are the source of the high nitrate concentrations that are present in the groundwater at the water table below the MWL dump. The distant TA-3 septic systems can not be the source of the nitrate contamination unless the lateral speed of groundwater travel in the fine-grained alluvial fan sediments is several orders of magnitude greater than 0.17 feet/year.
- Fourth, The corroded well screens prevented the four monitoring wells from producing reliable and representative groundwater samples. RCRA and the NMED Sandia Consent Order require replacement of monitoring wells that do not produce reliable and representative water samples.
The above Finding of Fact 81 in the Hearing Officer's Report is evidence that RCRA required replacement of the defective monitoring wells MWL-MW1 and -MW3 in 1992. However, the two unreliable monitoring wells were not replaced until 2008 (The replacement wells are also unreliable – see Section Executive Summary- p.15 at

http://www.radfreenm.org/pages/GroundWaterProtection/SANDIA_MWL_DUMP_EXECUTIVE_SUMMARY.pdf).

#4 deficiency. The NMED 1998 NOD Report recognized that the data collected from pumping tests were unreliable and not usable to calculate the speed of groundwater travel below the MWL dump as follows:
The pumping tests for monitor wells MWL-MW1, MWL-MW2, MWL-MW3, and MWL-MW4 appear to have failed because the yield of each well was too small to permit a successful pumping test to be conducted. The pumping test conducted on MWL-MW4 (Lower) also appears to have failed, . . . none of the drawdown curves appears to have a form which matches that of a type curve. Therefore, the reported values for hydraulic conductivity and transmissivity are not considered by the HRMB [now the NMED HWB] to be reliable [Emphasis added](p. 7-8).
In addition, the NMED 1993 Report (Moats and Winn, 1993) recognized that the three mud-rotary monitoring wells MWL-MW2, -MW3 and -BW1 did not produce reliable data on hydraulic properties as follows:
The use of mud-rotary drilling methods should be avoided in any future monitor well installations at the MWL. Mud rotary is not a preferred drilling technology due to its potential detrimental impacts to ground-water quality and the hydraulic characteristics of an aquifer (p. 3).
Nevertheless, DOE/Sandia used the unreliable pumping test data that was rejected by the NMED 1998 NOD report and the unreliable hydraulic properties measured in the three mud-rotary wells (Moats and Winn, 1993) to calculate incorrect values for the speed of groundwater travel below and away from the MWL dump (Goering et al., 2002).

#5 deficiency. The NMED 1998 NOD Report required a risk assessment of the potential impacts of the Sandia MWL dump on local and regional groundwater quality as follows:
The nature and extent of subsurface contamination indicate that some contaminants are a potential threat to ground-water quality beneath and downgradient (west) of the MWL. A simple screening comparison of contaminant concentrations in subsurface soils against available EPA soil screening levels (SSL's) developed for the protection of ground-water resources demonstrates exceedences for cadmium and nickel (U. S. EPA, 1996, Soil Screening Guidance: Technical Background Document, EPA/540/R-95/128. Office of Emergency and Remedial Response, Washington, DC. PB96-963502) (p.4).

Therefore, the risk assessment for the MWL must evaluate potential impacts of cadmium, nickel, and other contaminants (metals such as cobalt and copper, and radioactive materials such as uranium and tritium, for which SSL's are not available at this time) on local and regional ground-water quality (p.4-5).
The risk assessment required by the NMED 1998 NOD Report was not performed. The risk assessment is a requirement under RCRA because the MWL dump has contaminated the groundwater. The nature and extent of the groundwater contamination is not known because a reliable network of monitoring wells was not installed at any time.

There are two different zones of saturation beneath the MWL dump, the fine-grained alluvial fan sediments and the deeper highly productive Ancient Rio Grande (ARG) sediments. The risk assessment should be performed after the required networks of monitoring wells are installed in the two zones of saturation beneath the MWL dump and sufficient water

quality data are collected from the two networks. None of the deficiencies in the NMED 1998 NOD Report (or in the EPA 1994 NOD Report) were resolved to the present time in 2011.

The NMED HWB did not require DOE/Sandia to replace the two defective monitoring wells MWL-MW5 and -MW6. Instead, the NMED HWB accepted the water quality data from the two defective monitoring wells as reliable and representative over all time to the present in 2011. These two defective wells are still in the current network and proposed for long term monitoring wells.

The U. S. Congress commissioned a study of contamination issues at the Sandia MWL Dump by WERC. WERC (A Consortium for Environmental Education and Technology Development at the New Mexico State University) performed two expert reviews of contamination issues at the Sandia MWL dump (WERC, 2001, 2003). DOE/Sandia staff knowingly presented false information to two expert peer review panels performed by WERC in 2001 and 2003. The false information presented was that there was a reliable network of monitoring wells at the Sandia MWL, that BW-1 was an upgradient monitoring well, that that MW1, MW 2, MW5 and MW6 were down gradient wells and a large number of water samples collected from the wells over a period of ten years showed that the MWL had not contaminated the groundwater. DOE/Sandia did not address that onsite monitoring well MW4 was screened too deep below the water table.

The information contained in the six reports showing that there was only one downgradient well and no background monitoring well was omitted from the DOE/Sandia presentation to WERC. The presentation of the Groundwater Monitoring Program Overview by on March 22, 2001 included in the final WERC Report as reference #108 presented background well BW-1 as Upgradient and MW1, MW2, MW3, MW5, MW6 as Downgradient. In fact, DOE/Sandia did not provide any of the six reports written over the years 1991 to 1998 that described the monitoring well network as inadequate to detect groundwater contamination from the MWL dump.

The WERC did not consider data quality but only assumed that DOE/Sandia was presenting accurate information.

The statement in the WERC report that monitoring wells were installed in the "underlying aquifer" is incorrect. A monitoring well network was not installed in the underlying aquifer in the highly productive ARG Deposits. Installation of a network of monitoring wells in the productive ARG Deposits is a requirement of RCRA and the NMED Sandia Consent Order.

The NMED Administrative Record (AR) shows that at the time of the public hearing, NMED omitted from testimony that there was not a RCRA compliant and reliable well monitoring network at the MWL. Testimony at the Public Hearing in December 2004 was that groundwater flow was to the west-northwest. (Hearing Officer "HO" Findings, #41, p.8). However, NMED knew from 1993 to the present that groundwater flow was to the south-southwest. Therefore, at the public hearing NMED knew the monitoring wells were not in the required upgradient and downgradient locations from the reports issued during the period from 1991 to 1998 by scientists from the DOE Tiger Team, Los Alamos National Laboratory, NMED and the U.S. Environmental Protection Agency (EPA).

NMED incorrectly asserted at the 2004 public hearing that there was "No contamination of the groundwater" even though NMED knew there were no reliable groundwater monitoring wells at the Sandia MWL at any time. (Hearing Officer HO #69, p.13 - HO #77 & #79, p.14). "[T]he landfill presents little risk of groundwater contamination…" (HO #73, p.13) However, NMED knew risk could not be evaluated because the monitoring network was not adequate.

At the 2004 public hearing, NMED knew the MWL monitoring wells were at wrong locations, well screens were misplaced, wells were constructed and sampled incorrectly and that corroded well screens existed.

At the 2004 public hearing, NMED knew the monitoring well data were inadequate to select the dirt cover as a remedy based on the data from a defective monitoring well network. In fact, the NMED 2007 Fact Sheet for LANL MDA H shows that NMED knows that a soil cover will not be protective of a) surface pathways for contamination or b) for groundwater protection. The NMED contaminants of concern at both MDA H and the MWL are tritium and solvents (VOCs). Excerpts from the NMED Fact Sheet for MDA H are pasted below:

> "However, NMED's assessment indicates that the ET cover can only partially prevent intrusion of deep-rooting plants and burrowing animals. In addition, this alternative does not address the current and future releases of VOCs and tritium to the subsurface at MDA H [emphasis supplied]. -- NMED questions the long-term reliability of the engineered ET cover in preventing the intrusion of deep-rooting plants and burrowing animals. -- The potential for biointrusion to the shafts from the surrounding areas poses not only the risk of transport of waste to the surface, but also the risk of creation of conduits that could channel water through the [unlined disposal] shafts." (p. 11, NMED Fact sheet for MDA H)

Additionally, NMED was informed by the 2006 TechLaw, Inc. report that the dirt cover for the MWL dump would not maintain its integrity for the 1000 year period required. http://www.radfreenm.org/pages/GroundWaterProtection/SANDIA_MWL_DUMP_EXECUTIVE_SUMMARY.pdf

The NMED Final Order (Curry 2005) required that a Fate and Transport Model be made to model contaminant movement beneath the dump. During discussions between Citizen Action and Southwest Research and Information Center (SRIC) and the NMED about the Fate and Transport Model, NMED withheld a 2006 TechLaw, Inc. report from the public by NMED until late 2009. When Citizen Action requested the TechLaw report in 2006, NMED sued Citizen Action to prevent the release of the TechLaw report that cast further doubt on the NMED decision for the dirt cover remedy. http://www.radfreenm.org/pages/Legal/lg-2008oct08a.pdf
The TechLaw Report identified issues with
- 1). the incorrect design of the dirt cover,
- 2). the poor long term viability of the dirt cover, and
- 3). the deficiencies in the DOE/Sandia computer model used for contaminant movement modeling.

The January 31, 2006 report by TechLaw, Inc. advised the NMED that the neutron probe access holes installed below the buried wastes were a mistake because they did not monitor the breakthrough of moisture directly under the cover. The TechLaw Inc. report recommended the installation of instrumentation in the dirt cover to measure the breakthrough of moisture but the dirt cover installed over the dump did not include the instrumentation. http://www.radfreenm.org/pages/SecretDocuments/sd-2006jan31a.pdf

A $275,000 April 14, 2010 Environmental Protection Agency Office of Inspector General (IG) Audit Report found that EPA Region 6 staffers had concerns similar to Citizen Action and Registered Geologist Robert Gilkeson about the lack of effective groundwater monitoring at the Sandia MWL dump. The EPA IG also found that the oversight report of the EPA Region 6 staff's for MWL dump groundwater monitoring concerns are still being withheld from Citizen Action and the public. The EPA Region improperly stamped its Oversight Report "Confidential" for national security purposes according to the OIG. (http://www.epa.gov/oig/reports/2010/20100414-10-P-0100.pdf p.3 -- "Region 6 withheld information from the public regarding the MWL monitoring wells through:

- discontinuation of record keeping,
- misleading communications, and
- inappropriate classification.")

The EPA IG found further that NMED and EPA Region 6 agreed that discussions about concerns for the monitoring well network at the MWL dump would not be documented in writing to avoid discovery of the documents by Citizen Action under the FOIA. (OIG report p.3 – "EPA conveyed its Oversight Review concerns regarding the MWL monitoring wells to NMED orally, and NMED was not required to formally respond to the technical team's concerns regarding the MWL monitoring wells.") Thus, EPA and NMED prevented public participation and withheld relevant facts from the public during the RCRA process for corrective measures. As reported by the EPA IG, EPA Region 6 stamped the oversight report "Confidential" thereby making the report unavailable under the Freedom of Information Act.

Withholding relevant facts and reports allowed NMED and DOE/Sandia to proceed with constructing the dirt cover without opposition from an uninformed public without access to the facts. Citizen Action still has not obtained the Oversight Report from EPA Region 6. (*See,* U.S. EPA Office of Inspector General, April 14, 2010. Hotline Report – *Region 6 needs to improve Oversight Practices.* Report No. 10-P-0100, April 14, 2010. http://www.epa.gov/oig/reports/2010/20100414-10-P-0100.pdf).

A reliable network of groundwater monitoring wells was not provided at the Sandia MWL dump from the first well installed in 1988 to the four new wells installed in 2008. A total of nine contaminant detection monitoring wells and two background water quality monitoring wells were installed at the MWL dump over the 20-year period from 1988 to 2008. Table 1 below on the next page is a summary of the year of installation and current status for the eleven defective monitoring wells at the MWL dump. The unreliable monitoring wells MWL-MW1, -MW2, -MW3 and -BW1 were plugged and abandoned in 2008 and replaced with the four new unreliable monitoring wells MWL-MW7, -MW8, -MW9 and -BW2, according to Registered Geologist Robert Gilkeson**.**

(http://www.radfreenm.org/pages/GroundWaterProtection/SANDIA_MWL_DUMP_TEXT_JANUARY_2011.pdf pp-29-44). All of the six contaminant detection monitoring wells in the current monitoring well network (wells MWL-MW4, -MW5, -MW6, -MW7, -MW8 and –MW9 are unreliable and require replacement. See the following Table 1.

There are two zones of saturation below the Sandia MWL dump that require networks of monitoring wells. A reliable network of monitoring wells was not installed in either of the two zones. Figure 6 is a geologic cross section that shows the two zones of saturation below the MWL dump that require networks of monitoring wells. The upper zone is the water table in the fine-grained alluvial fan sediments. The deeper zone is the Ancestral Rio Grande Deposits (ARG Deposits) that are below the layer of fine-grained alluvial fan sediments that form a leaky confining bed above the ARG Deposits.

Table 1. Sandia MWL Dump Monitoring Wells

*** The locations of the eleven monitoring wells are displayed on Figures 7.**

Year of
Installation Well No. / Current Status

- 1988 – well MWL-MW1 / The defective monitoring well was plugged and abandoned in 2008.

- 1989 – wells MWL-MW2, -MW3 and -BW1 / The three defective monitoring wells were plugged and abandoned in 2008.

- 1993 – well MWL-MW4 / The defective monitoring well is in the current network.

- 2000 – wells MWL-MW5 and -MW6 / The two defective monitoring wells are in the current network.

- 2008 – wells MWL-MW7, -MW8 and -MW9 / The three defective monitoring wells are in the current network.

- 2008 – well MWL-BW2 / The new background water quality well may be defective because the drilling and well construction requirements in the NMED 2004 Consent Order were not followed

<u>Reasons the monitoring wells do not furnish reliable and representative groundwater samples</u>.

- Wells MWL-MW1 and -MW3 were the only two monitoring wells with any capability to detect contamination from the MWL dump.

- Wells MWL-MW2, -MW5, -MW6 and -BW1 – four wells installed at incorrect locations and too distant from MWL dump to detect groundwater contamination.

- Wells MWL-MW1, -MW2, -MW3 and -BW1 – corroded stainless steel well screens prevented the detection of many contaminants.

- Wells MWL-MW2, -MW3 and -BW1 – mud-rotary drilling method contaminated the three wells with bentonite clay drilling muds that prevented the detection of many contaminants and prevented collection of reliable data on speed of groundwater travel.

- Wells MWL-MW4, -MW5 and -MW6 – three wells with screens installed too deep to detect contamination at water table and measure elevation of water table.

- Well MWL-MW5 – screen installed across two zones of saturation prevented well from having any use. In addition, the screen is contaminated with bentonite clay/cement grout with properties to prevent the detection of contamination and prevent collection of reliable data on speed of groundwater travel.

- Wells MWL-MW7, -MW8 and -MW9 – three wells installed in 2008 were drilled with improper methods with 30-ft screens installed too deep to detect contamination and measure the elevation of the water table below the MWL dump.

- Wells MWL-MW1, -MW2, -MW3, -MW4, -MW7, -MW8, -MW9 and -BW1 – the high-flow pumping methods purged the wells dry and highly aerated water samples were collected up to a week later. This sampling method removes volatile and trace metal contaminants from the collected water samples.

A DOE/Sandia 2008 field investigation showed a new large release of tritium and solvent contamination from the unlined trenches and pits at the Sandia MWL dump that was not investigated. DOE/Sandia performed a limited and incorrectly designed field investigation in 2008 that discovered a 10-fold increase of tritium contamination released from the wastes buried in the unlined trenches and pits at the MWL dump. The new release of contamination should have required implementing a comprehensive investigation to determine the nature and vertical and horizontal extent of the contamination in the vadose zone below the MWL dump before the dirt cover was installed over the wastes that were releasing the contamination.
The required careful investigation of the new contamination discovered in the vadose zone below the unlined trenches and pits was not performed. Instead, DOE/Sandia issued a final report (DOE/Sandia, August 2008) that did not recognize the new contamination and recommended the installation of the dirt cover above the buried wastes. The pertinent incorrect conclusion in the DOE/Sandia Report follows:
Because the findings of this investigation are consistent with the conceptual model of the MWL, the [dirt] cover should be constructed (p. ii).

The findings of the 2008 field investigation were not consistent with the conceptual model of the Sandia MWL dump. The conceptual model was that the 10-fold increase in tritium contamination in the vadose zone below the MWL dump that was discovered in the 2008 field investigation was evidence that the unlined pits and trenches were still releasing contamination which may include other contaminants in addition to tritium. The dirt cover should not have been constructed until the nature and extent of the new contamination in the vadose zone below the MWL dump was fully understood.
The large increase in tritium concentrations measured in the DOE/Sandia 2008 field investigation is displayed in Figure 9 and is direct evidence of a new large release of tritium contamination and possibly other contamination including VOCs and heavy metals from the wastes buried in the unlined pits and trenches at the MWL dump. The actual increase in tritium and other contamination below the MWL dump is not known because of the sparse number of boreholes in the 2008 field investigation. None of the six boreholes were
- 1). located close to the previous boreholes where high tritium concentrations were measured,
- 2). located close to Trench A in the unclassified area and the 12 pits in the classified area where the large inventory of tritium wastes are buried or
- 3). drilled to a sufficient depth to characterize the vertical extent of tritium and VOC contamination.

A new comprehensive investigation of the nature and extent of contamination in the vadose zone below the MWL dump is a requirement to protect public health and the environment and to ensure that the required network of monitoring wells are installed in the vadose zone below the unlined trenches and pits at the MWL dump for early detection of new releases of contamination for the required long-term monitoring.

SECTION V—REGULATORY NON-COMPLIANCE

Violations of environmental laws at the Sandia/DOE MWL dump have resulted from failure to enforce the April 29, 2004 Compliance Order on Consent (Consent Order) and regulations adopted under the Resource Conservation and Recovery Act (RCRA). The NMED HWB has not enforced the groundwater monitoring requirements in the April 29, 2004 Consent Order. RCRA

regulations have not been accomplished for: provision of a closure/post-closure plan, characterization of the MWL wastes, and for the installation of a reliable monitoring well network at the Sandia MWL dump for protection of public health and the environment. DOE Orders for protection of the public and environment from radiation have not addressed the transuranic and other radioactive wastes in the MWL.

The Consent Order at Section III. Definitions – states that "Groundwater" means interstitial water which occurs in saturated earth material and which is capable of entering a well in sufficient amounts to be utilized as a water supply." That definition would apply to the Ancient Rio Grande (ARG) sediments that furnish water for Albuquerque's municipal wells. The Consent Order, Section VIII, p. 64 requires application of U.S. EPA, *RCRA Groundwater Monitoring: Draft Technical Guidance*, EPA/530-R-93-001, Nov. 1992 and, U.S. EPA, and the *RCRA Groundwater Monitoring Technical Enforcement GuidanceDocument*, OSWER-9950.1, Sept. 1986.
http://www.nmenv.state.nm.us/hwb/SNL/Order_on_Consent/final/SNL_CONSENT_ORDER_April-29-2004_FINAL.pdf) Collectively, these documents require installation of groundwater monitoring well networks that provide reliable and representative samples to detect contamination in the two distinct zones of saturation below and immediately surrounding the MWL dump:
– 1). at the water table in the fine-grained alluvial fan sediments and
– 2).in the productive Ancient Rio Grande Deposits (ARG Deposits).

The required reliable monitoring well networks are not installed in either zone. Only MWL-MW6 is was installed in the ARG but at a distance too great from the MWL dump. No monitoring wells are installed to the south of the MWL dump.

The Sandia September 2007 Long Term Monitoring and Maintenance Plan (LTMMP)**,** which has not been approved by the NMED, blurs the distinction between the meaning of the ARG Deposits as an aquifer that requires monitoring and the fine-grained alluvial fan sediments that are not an aquifer. The LTMMP Section 2.1.2 states:
"Groundwater occurs approximately 500 feet bgs within Santa Fe Group deposits (basin fill), in either fine-grained alluvial fan deposits or coarse-grained Ancestral Rio Grande deposits."
This above LTMMP statement does not identify and apply the mandatory definition of "groundwater" which all parties agreed to in signing the Consent Order. Monitoring of the "Groundwater" that is by definition capable of supplying the municipal wells is required to be monitored. The LTMMP monitoring network does not provide a RCRA compliant well monitoring network for the Ancient Rio Grande strata that is solely capable of supplying the municipal wells.

The Continued Acceptance and Failure to Invalidate the Flawed Data from the Defective Monitoring Wells for NMED Decision Making Violate Both the Consent Order and RCRA.
The monitoring well network at the Sandia MWL dump was/is not capable of providing reliable and representative water quality data. Both NMED and DOE/Sandia have a duty to verify whether information is incorrect and to promptly submit correct information. Nevertheless, there is an ongoing continuing pattern and practice of unreliable data submission by Sandia/DOE and acceptance of unreliable data for decision making by the NMED. The incorrect information has

not been corrected by DOE/Sandia. (40 CFR 270.30 (l)(11) and 20.4.1.900 NMAC -- Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, it shall promptly submit such facts or information. Also, 270.41-270.43, 270.43(2) -- The permittee's failure in the application or during the permit issuance process to disclose fully all relevant facts, or the permittee's misrepresentation of any relevant facts at any time).

NMED made a decision to place a soil cover over the MWL dump wastes based on the incorrect and unreliable data from a monitoring well network known to be defective. DOE/Sandia and NMED obtained a favorable outcome of the WERC investigation and the 2004 public hearing by omission and misrepresentation of relevant facts.

The close similarity in incorrect testimony between NMED and DOE/Sandia witnesses at the 2004 public hearing is indicative of a plan to omit and withhold relevant facts from the decision maker and the public to obtain the dirt cover remedy to leave the MWL dump wastes in place. NMED and DOE/Sandia had the knowledge that the MWL dump did not have a monitoring well network capable of detecting contamination. Despite this knowledge, NMED and DOE/Sandia witnesses provided incorrect testimony at the NMED December 2004 Public Hearing for the dirt cover remedy that there was a reliable monitoring well network and no evidence of contamination to the groundwater.

Additionally, the incorrect testimony and continuing failure to promptly submit relevant information and provide accurate information constitutes an ongoing violation of the public participation requirements of RCRA provide a meaningful opportunity for public comment and review. By furnishing misinformation and withholding relevant facts, the public is unable to exercise a request for modification, termination or reissuance of the permit. 40 CFR 124.5; 63 FR 56710 et seq.

The staff of NMED and DOE/Sandia provided incorrect testimony at the NMED December 2004 Public Hearing that the direction of groundwater flow at the water table was to the northwest. For example, the Testimony of NMED staff person Ms. Carolyn Cooper:
Currently, groundwater at the mixed waste landfill flows west, with a slight northwest component of flow (v. III, p. 918, l. 25, p. 919, l. 1-2)
Downgradient monitoring wells MW-1 and MW-2 are located north of the landfill, and MW-3 is situated to the west of the landfill (v. III, p. 919, l. 11-13).

The Testimony of DOE/Sandia consultant Mr. Tim Goering was:
The groundwater flow direction at the site is towards the west, with a slight north component of flow (v. I, p. 93, l. 18-19).

So, in summary, I can state that there is no evidence that there is ground-water contamination from the mixed waste landfill (v. I, p. 100, l. 22-24).

The 1994 EPA Region 6 NOD Report informed DOE/Sandia that the unreliable monitoring well network could not be used for the conclusion in the testimony of Mr. Goering that the MWL

dump had not contaminated the groundwater. The pertinent excerpt from the 1994 EPA Region 6 NOD Report follows:
Based on the southwest gradient flow of groundwater, the MWL monitoring wells are located cross gradient instead of downgradient from the MWL; therefore, contaminants emanating from the MWL may not be detected in the monitoring wells [Emphasis supplied] (p. 6).

Two letters in 2007 from James Bearzi, the Chief of the NMED Hazardous Waste Bureau (HWB), acknowledge that groundwater flow is to the southwest by requiring a repositioning of the new background monitoring well MWL-BW2, http://www.nmenv.state.nm.us/hwb/SNL/SNL_3-23-2007_Replacement_of_MWL_Mon_Well_BW1.pdf and replacement for wells MW1 and MW3. http://www.nmenv.state.nm.us/hwb/documents/7-2-2007_NMED_SNL_Require_Replacement_MWL_Wells_MW1_and_MW3.pdf.

The crucial fact for correctly positioning the groundwater monitoring wells was that the flow of groundwater at the water table is to the southwest. This was realized after the placement of the groundwater monitoring wells based on an incorrect assumption that groundwater flow is to the northwest. Reports of the monitoring well placement error were identified beginning in 1991 and subsequently reported numerous times in the NMED Administrative Record. The August 26, 1991 RCRA Work Plan states:
"According to the regional water level contour maps, the hydraulic gradient at the MWL should be toward the west and northwest. However, current water level elevation information for the four MWL monitor wells (Appendix A) indicate that the hydraulic gradient is toward the southwest, approximately 40 degrees counter-clockwise to the regional gradient." (Emphasis supplied).

Thus, NMED, EPA and Sandia/DOE all knew: No background well existed and there were not three downgradient wells to monitor the groundwater because the wells were positioned with the assumption that the flow direction was to the northwest.
However, no steps have been taken to correct two decades of misinformation from monitoring wells that were not in appropriate locations, had corroding well screens, were drilled with drilling muds that hide knowledge of contamination and were incorrectly sampled.

The NMED admission that groundwater flow at the water table is to the southwest requires the installation of a reliable network of monitoring wells along the southern and western boundary of the MWL dump. (40 CFR 264.95). Monitoring along the southern boundary has not heretofore been provided at the MWL dump. The current network of the six contaminant detection monitoring wells MWL -MW4, -MW5, -MW6, -MW7, -MW8 and -MW9 is displayed on Figure 7. The purpose of the current network is monitoring groundwater contamination at the water table below and to the west of the MWL dump. However, the six contaminant detection monitoring wells on Figure 7 fail for this purpose. The NMED HWB has not enforced the requirement in the Consent Order for replacement of the six defective monitoring wells. Instead, the NMED HWB has issued an approval letter for the three new defective monitoring wells MWL-MW7, -MW8 and -MW9 and accepts the DOE/Sandia annual groundwater monitoring reports that use the unreliable groundwater quality data from the current network of seven defective monitoring wells.

DOE/Sandia is violating its duty not to submit incorrect information (40 CFR 270.30(l)(11)) and is also failing to report its noncompliance with monitoring requirements under RCRA and the Consent Order (40 CFR 270.30(l)(10)). NMED is violating its duty to verify the accuracy of information for monitoring data, verify the adequacy of sampling, monitoring and whether Sandia/DOE is properly developing such information. (40 CFR 270.15).

These still uncorrected violations report have been brought to the attention of NMED on numerous occasions by both Citizen Action New Mexico and Registered Geologist Robert H. Gilkeson and. (40 CFR 270.15 (b)(4)). NMED is failing to exercise control over Sandia/DOE groundwater monitoring at the MWL dump (40 CFR 271.22 (a)(2)(i)); failing to comply with public participation requirements (40 CFR 271.22 (a)(2)(iii)); failing to act on violations of permits and other program requirements contained in the Consent Order and RCRA (40 CFR 271.22 (a)(3)(i)), and; failing to inspect and monitor activities subject to regulation (40 CFR 271.22 (a)(3)(iii)).

The violation of public participation requirements. The work plans and the installation of the new groundwater monitoring wells MWL-BW2 and MWL-MW7, -MW8 and -MW9 as new upgradient and downgradient monitoring wells were not presented to the public prior to approval and installation. Public participation for work plans and monitoring well installation is required by RCRA public participation requirements. 40 CFR 270.42 and Appendix I – Classification of Permit Modification-- section C. Ground-Water Protection, sections 1-8 thereto, provides that "changes in the number, location, depth, or design of upgradient or downgradient wells of permitted groundwater monitoring systems," "changes in point of compliance" are Class 2 Modification. "Replacement of an existing well that has been damaged or rendered inoperable, without change to location, design or depth of well" is a Class 1 Modification requiring public notification, review and comment. The changes to the MWL well monitoring network also constitute Class 2 modifications. For Class 2 Modifications, the permittee must submit a Modification request to the Director, notify persons, provide a comment period, provide a public meeting and other requirements.

63 Federal Register 56710, 56720 (October 22, 1998) sets out the requirements for public comment throughout the cleanup process including site characterization: "For example, the affected community should be notified and given the opportunity to comment prior to the initiation of any activity to assess contamination." Public participation is to take place "very early in the process" and "prior to the initiation of any activity to assess contamination or prior to the implementation of any interim measure."

NMED violated public participation requirements by withholding and omitting information crucial to the decision making process for the remedy selection. NMED omitted information that showed the inadequacy of the defective groundwater monitoring wells. NMED failed to submit several major documents for public review and comment as required by the Final Order. NMED deliberately kept a key 2006 TechLaw, Inc. document secret for three years regarding fate and transport of contaminants beneath the dump.

NMED made an agreement with the technical staff at EPA Region 6 to not document conversations between NMED and EPA Region 6 regarding the MWL dump monitoring network. The agreement was made so that Citizen Action could not obtain documentation regarding the discussions. Concerns in the EPA Region 6 Oversight Report for the groundwater monitoring network were orally conveyed to NMED so that Citizen Action could not see the Oversight Report and know the EPA concerns. (http://www.epa.gov/oig/reports/2010/20100414-10-P-0100.pdf, at p.3). Thus, EPA and NMED prevented public participation by withholding relevant facts from the public during the RCRA process for corrective measures. Withholding relevant facts and reports allowed NMED and DOE/Sandia to proceed with constructing the dirt cover without opposition from an informed public with full access to the facts.

The New Mexico Environment Department (NMED) described the defective and unreliable monitoring well network at the Sandia MWL dump as a reliable network of monitoring wells in the NMED November 2006 Moats Report. In November of 2006 the New Mexico Environment Department (NMED) Hazardous Waste Bureau (HWB) published the report titled *Evaluation of the Representativeness and Reliability of Groundwater Monitoring Well Data, Mixed Waste Landfill, Sandia National Laboratories* by William P. Moats, David L. Mayerson and Brian L. Salem (Moats et al., 2006).
- The NMED November 2006 Moats Report makes the incorrect conclusions that
- 1). all of the seven monitoring wells at the Sandia MWL dump that are displayed on Figure ES-2 provided reliable and representative water quality data and
- 2). there is no evidence of groundwater contamination from the wastes buried in the Sandia MWL dump.

The monitoring well network that was presented as a reliable and sufficient network in the NMED November 2006 Moats Report was the same network that was described as unreliable and not in compliance with RCRA in 1). the 1991 LANL report (Rea, 1991), 2). the 1993 NMED Report (Moats and Winn, 1993), 3). the 1994 EPA Region 6 Notice of Deficiency (NOD) Report (EPA 1994) and the 4). 1998 NMED HWB NOD Report (Garcia 1998).

The four reports listed above described the reasons that it was necessary to replace all of the seven defective monitoring wells that were described as a reliable network in the NMED November 2006 Moats Report. The methodology and conclusions of the NMED November 2006 Moats Report lack scientific basis, are known to be incorrect and the Moats Report requires retraction.

An important reason the NMED November 2006 Moats report should be retracted is that the evaluation methodology only studied the impact of the bentonite clay contamination from the mud-rotary drilling method and from mistakes in well construction on the ability of the four monitoring wells MWL-BW1, -MW2, -MW3 and -MW5 to produce reliable and representative water samples. The Moats Report ignored the effects of the corroded well screens. In addition, the incorrect locations for five of the seven monitoring wells was ignored. Of the four monitoring wells evaluated in the 2006 Moats Report, only well MWL-MW3 was at a location that could detect groundwater contamination from the MWL dump. NMED failed to submit the Moats report to the public for review and comment, as required by the Final Order for major documents, prior to its release for the purpose of putting out of sight the serious deficiencies of

the groundwater monitoring network. The Moats report was repeatedly used in the NMED Responses to Public Comments to set aside technical concerns of Citizen Action and Mr. Gilkeson that new wells should be installed at the MWL dump. (See Response to R29, p. 35 described below in section 9.10).

Mr. Moats was the lead technical person for the review of the DOE/Sandia RFI Reports and for the issuance of the NMED 1998 NOD Report. Mr. Moats was the coauthor on the 1993 NMED Report that described the monitoring well network at the MWL dump as "inadequate." Mr. Moats was also the lead person for the April 29, 2004 NMED DOE/Sandia Consent Order.

It was a violation of RCRA for Mr. Moats to omit substantive and relevant information at the NMED December 2004 Public Hearing regarding the significant deficiencies that he knew existed in the Sandia MWL dump monitoring well network.

Concerns for the Fate and Transport Model (FTM) were dismissed in the NMED Responses to public comments. (New Mexico Environment Department, November 2006. New Mexico Environment Department November 2006 Response to Comments on the Sandia MWL Corrective Measures Implementation Plan. http://www.nmenv.state.nm.us/hwb/snlperm.html) **The NMED Responses did not report the technical concerns contained in the TechLaw report that the Sandia computer model was a "black box" that NMED should not use.** The Moats report nevertheless relied on the FTM and did not disclose the contrary conclusions in the TechLaw report.
The 2006 TechLaw, Inc. report was withheld from the public until late 2009 during the period when consideration of the Fate and Transport Model were under consideration. The TechLaw report contained information that cast further doubt on the NMED decision for the dirt cover remedy. The TechLaw Report identified issues with 1). the incorrect design of the dirt cover, 2). the poor long term viability of the dirt cover, and 3). the deficiencies in the DOE/Sandia computer model used for contaminant movement modeling. The Moats Report and the Responses to Public Comment withheld the information contained in the TechLaw report from the public.

NMED failed to provide either version 1 or version 2 of the DOE/Sandia 2007 FTM Report to the public for review and comment as required for major documents by the May 26, 2005 Final Order 46. The FTM Report was a major document because it was required by the Final Order. (See Sections 12.0 and 12.1 below).'

There are numerous, obvious inaccuracies and contradictions between the data and the textual conclusions contained in the 2008 Vadose Zone Report. The discrepancies further deny the public complete and accurate information for contamination beneath the MWL dump.

Sandia has failed to provide the 5-year assessment of the MWL dump as required by the Final Order.

SECTION VI -- RECOMMENDATIONS FOR ACTION

Actions which the public can take:

1. The public should demand that DOE Environmental Management (DOE EM) go forward with the CRESP expert review. DOE EM promised that a panel of experts known as CRESP would review the report by Gilkeson and Citizen Action regarding defective groundwater at the MWL dump. DOE EM has since decided to delay the review. The report can be viewed at the Citizen Action website www.radfreenm.org under the section of groundwater monitoring.

2. The Sandia RCRA Part B Hazardous Waste Permit requires consideration of the Long-Term Maintenance and Monitoring Plan for the Mixed Waste Landfill.

- Demand a public hearing for the Long Term Maintenance and Monitoring Program for the MWL dump.Request that a public hearing be provided for the Permit and the Long Term Maintenance and Monitoring Plan.
- Request that the Revised Draft Permit be publicly noticed for review by the public and opportunity for comment and review.
- Advocate for complete excavation and clean up of the MWL with above-ground storage of the waste in an engineered facility on site.

3. Demand a public hearing for the MWL dump as part of the Sandia hazardous waste permit process. Ask that the NMED proceed with the Sandia hazardous waste permit hearing process which has been stalled for several years.

The following benefits can be had from cleanup:

- Clean up GUARANTEES protection of Albuquerque's sole source aquifer from potential contamination from long-lived radioactive and hazardous waste buried at the dump.
- Helps to develop new technologies that can be used to clean up hundreds of similar waste sites across the nation.
- Sets a precedent for clean up of waste sites at Los Alamos National Laboratory that have released contaminants into the groundwater, surface waters and the Rio Grande.
- Decreases the risks of cancer and other illnesses to surrounding communities over the long-term.
- Releases future generations from the burdens of clean up of legacy waste from nuclear weapons production during the Cold War years.
- Illustrates pure Sandia "can-do" engineering that's been conducted at other landfills at Sandia Nat Labs: characterize the site, dig it up, sort out, identify, characterize the waste, and recycle as much of the material as possible.

2. Demand that Sandia produce the Five Year assessment report that the 2005 Final Order requires. The five year assessment has not been provided and NMED has not called for its presentation.

3. An action for failure of NMED to comply with the RCRA program could be filed with Region 6 EPA.

4. A lawsuit could be filed in state court for failure to comply with the Consent Order and the Final Order requirements.

5. A lawsuit could be filed in federal district court for the failure of EPA Region 6 to maintain oversight for the RCRA program as managed by the NMED.

6. A complaint could be filed with the DOE Office of Inspector General for the failure of Sandia Labs to protect the public from radiation by leaving Greater Than Class C Wastes in the MWL dump.

Past efforts with regulators have yielded few results. It is time for creative out-of-the-box strategizing to development new approaches to prevent the poisoning of Albuquerque's aquifer.

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