

MWL



ENTERED

**Allen, Pam, NMENV**

**From:** David McCoy <dave@radfreenm.org>  
**Sent:** Wednesday, September 04, 2013 2:52 PM  
**To:** Flynn, Ryan, NMENV; Moats, William, NMENV; AttyGen NM Gary King; EPAOIG/Arthru Elkins; Blaine, Tom, NMENV  
**Cc:** John Stomp; Kieling, John, NMENV; McDonald, William, NMENV; McQuillan, Dennis, NMENV; Skibitski, Thomas, NMENV; Allen, Pam, NMENV; Rep Gail Chasey; Rep. Danice Picraux; Rep. Harry Teague; peter.wirth@nmlegis.gov; benny.shendo@nmlegis.gov; Joseph@cervanteslawnm.com; senatorgriego@yahoo.com; Martinez, Richard; william.payne@nmlegis.gov; bill.soules@nmlegis.gov; pat.woods@nmlegis.gov; john.ryan@nmlegis.gov; Senator Cisco McSorley; Ortiz y Pino, Gerald; Matt Baca/SenLopez; pablor@abastoutility.com; eromero@cabq.gov; mayorberrry@cabq.gov; kbrown@bernco.gov; dherrera@bernco.gov; julianmoya@cabq.gov; azizachavez@cabq.gov; Shean, Frederic; Winchester, Jim, NMENV; curry.ron@epa.gov; EPA/Mathy Stanislaus; EPAIG Eileen McMahon; mcarthy.gina@epa.gov; Jonathan\_Epstein@armed-services.senate.gov; michele\_jacquez-ortiz@Tomudall.senate.gov; Michael\_Sullivan@heinrich.senate.gov; Jennifer.Catechis@mail.house.gov; heard.anne@epa.gov; Shields.Mike@epa.gov; Patterson.Kenneth@epa.gov; kling.dave@epa.gov; hargrove.robert@epa.gov; heiss.robert@epa.gov; wasserman.cheryl@epa.gov; Sen.Udall/Andrew Wallace; Eric Nuttall; Robert H Gilkeson, registered geologist; Cobrain, Dave, NMENV; kyuhhas@abcwua.org; District3@bernco.gov; District1@bernco.gov  
**Subject:** Continuing Regulatory Violations at Sandia Mixed Waste Landfill  
**Attachments:** SecretaryFlynn.letr.5yr.FINAL.pdf; Secretary Flynn Final Figures.pdf

September 4, 2013  
 Secretary Ryan Flynn  
 New Mexico Environment Department

Dear Secretary Flynn,

Please see letter and attached Figures file regarding ongoing regulatory violations for the Sandia National Laboratories' Mixed Waste Landfill.

Thank you.

Sincerely,

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September 4, 2013  
Secretary Ryan Flynn  
New Mexico Environment Department

Dear Secretary Flynn,

Thank you for your more aggressive stance for plans to implement remedial measures for the Kirtland AFB jet fuel spill.

Citizen Action requests that you also take protective steps in accordance with hazardous waste management laws for the Sandia National Laboratories' (SNL) Mixed Waste Landfill (MWL) that has unlined pits and trenches leaking into Albuquerque's drinking water aquifer. The MWL is a nuclear weapons legacy waste site. The state of New Mexico should not bear the financial responsibility for cleanup nor the environmental consequences of no cleanup.

As the Secretary stated in a recent meeting there has been "a long sordid legal history" for the MWL and the department needs to show leadership. The Secretary moved the New Mexico Environment Department (NMED) Hazardous Waste Bureau to the Health Division to improve performance. Citizen Action requests a meeting with the Secretary, the Director Resource Protection Division, Erika Schwender, the Thomas Blaine, Director of the Environmental Health Division, and John Kieling, Chief of the Hazardous Waste Bureau regarding issues for the SNL MWL.

Both the Department of Energy (DOE) SNL MWL and the Kirtland Air Force Base aviation gas and jet fuel spill sites show the common danger of not doing timely and reliable groundwater monitoring and cleanup before contamination reaches the drinking water aquifer.

The NMED May 26, 2005 Final Order (Curry) required SNL to make a review every five years about the feasibility for excavation of the MWL dump, review of the monitoring, likelihood of contaminants reaching groundwater, the suitability of the dirt cover and update of the fate and transport model. That report is 3 years overdue. NMED is planning on approving a SNL proposed Long Term Monitoring and Maintenance Plan (LTMMP) without a public hearing and without performance of the 5 year review.

Under state and federal hazardous waste law, changing the terms of the 2005 Final Order would first require a modification of the Final Order along with public notice and opportunity for a hearing. That modification process has not been provided and prevents the public from raising safety issues for the SNL MWL dump that are long overdue for consideration.

On October 24, 2012, a previous letter was sent to former secretary David Martin objecting to the non-performance of the 5-year review. No response was received from Secretary Martin. (See attached).

Due to the astounding history of denial of public participation, malfeasance and cover up for SNL MWL decision making, we are asking that you order an independent 5 year review for the feasibility of excavation of the MWL. We suggest that the EPA Kerr Laboratory in Ada, OK could be involved in conducting an independent review of groundwater issues to include review of the November 2006 report by William Moats entitled, "Evaluation of the Representativeness and Reliability of Groundwater Monitoring Well Data." The Kerr Laboratory could review the current groundwater monitoring well network and the Robert Gilkeson/Citizen Action report entitled "Defective Groundwater Protection Practices at the Sandia National Laboratories' Mixed Waste Landfill – The Sandia MWL dump," (December 30, 2010).  
<http://radfreenm.org/pages/GroundWater.htm>

We ask that the SNL proposed LTMMP be stayed until the 5-year review process is complete. The 2013 session of the NM Senate considered Senate Memorial 34 that requested immediate enforcement of the Final Order 5-year excavation feasibility review requirement.

Below is a brief outline of some of the issues and history of the Sandia MWL that was operated as an open dump (see the pictures in Figures 3 to 6). We hope that you will 1) meet with Citizen Action, Registered Geologist Robert H. Gilkeson, and Dr. Eric Nuttall, Ph.D. to review this matter, 2) take steps to rectify the denial of meaningful public participation, and 3) order compliance with laws designed to protect the public health and environment. We have a special concern for the failure of the NMED to enforce the requirements in the NMED SNL Compliance Order on Consent that was issued on April 29, 2004. Our goal for requesting enforcement of the 5-year review requirement is to allow admission of the many missing facts into the record of SNL MWL decision making, obtained, as you pointed out, as a result of "great perseverance".

Some of the hazardous and radioactive chemicals that are in the SNL MWL dump, one mile from the Mesa del Sol children's park (see Figure 1) include the following:

- Many radionuclides -119 barrels of Plutonium-239 and Americium-241 wastes – toxic for 250,000 years; Tritium found over 100 ft beneath the dump is of particular concern because it combines to form radioactive water that enters human cells.
- Tons of toxic metals. The MWL dump contains tons of metallic depleted uranium and lead. Both uranium and lead present a major health hazard to humans. EPA's maximum concentration limit in drinking water for uranium is 44 parts per billion (ppb) and 15 ppb for lead. Both materials are subject to oxidation and dissolve in water.
- Over 40,000 pounds of depleted uranium, some of which caught fire twice in pits.
- 271,500 gallons of reactor waste water containing hexavalent chromium.
- PCBs and Solvents such as TCE, PCE.

The MWL wastes are entering the groundwater. Nickel, chromium, cadmium and nitrates appeared in groundwater samples collected from the older defective monitoring wells MWL-MW1 and –MW3 that were installed in 1988 and 1989 (see Figure 8). Soil

vapor studies conducted in 2007 show that cancer causing volatile organic solvents are moving deeper beneath the MWL dump. Tritium data showed concentrations were ten times higher and found at deeper levels than a decade ago.

Sandia maintains that no liquids were placed in the MWL dump that could move wastes to the groundwater. 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. Five thousand 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. Massive 50,000 pound roller equipment used for compaction of the dirt cover during construction may have crushed flimsy containers and released more contamination from the MWL. The total inventory for the MWL dump is unknown and some is classified. (See Figure 7). Risk assessment for the MWL was not based on what could be a full release of all of the MWL contents. A risk assessment was not performed for groundwater contamination although the RCRA Phase I and Phase 2 Investigations determined a large release of RCRA metals and solvents occurred from the unlined pits and trenches.

The SNL MWL dump has never had a reliable network of groundwater monitoring wells. After the first four groundwater monitoring wells were installed at the MWL during 1989-1990 (wells MWL-MW1, -MW2, -MW3 and -BW1 on Figure 8), it was learned that the groundwater flow direction was not to the northwest, but to the southwest. The New Mexico Environment Department, the Environmental Protection Agency, the scientists at the Los Alamos National Laboratory, the DOE/SNL Oversight Bureau, and the DOE Tiger Team documented in reports issued over the years 1991 to 1998 that the groundwater monitoring wells were installed in the *wrong locations* had *corroded well screens* and were *contaminated with Bentonite clay that hides evidence of contamination*. In 2000, two subsequent monitoring wells (wells MWL-MW5 and -MW6 on Figure 8) were installed too deep and distant from the MWL dump to be of use.

A congressionally appointed commission, called WERC, investigated the SNL MWL dump but was not provided information regarding the out of place, defective groundwater monitoring network. Even so, in 2003 the WERC Panel “felt strongly that the uncertainty of the contents in the MWL could eventually lead to the requirement (or choice) of excavation followed by subsequent final disposal of the MWL contents.” The Panel strongly recommended vadose zone monitoring (that has never been performed) and a fate and transport model. <http://www.ieenmsu.com/wp-content/uploads/2011/07/finalreport.pdf>, p. iv, vi. Only 3 soil-vapor monitoring wells have been proposed for the LTMMP that are an insufficient number to monitor the MWL, particularly at hot spots.

The SNL MWL dump monitoring wells were providing data that could not possibly be accurate. Numerous documents from the administrative record, recent documents received from the Freedom of Information Act lawsuits, an audit report by the EPA Office of Inspector General, Inspector General interviews with EPA Region 6 personnel

and independent reports by Registered Geologist Robert Gilkeson strongly attest to this prior knowledge. Nevertheless, the NMED presented the erroneous data at a public hearing held in December 2004 to justify the May 26, 2005 Final Order to leave the MWL dump wastes in place under a dirt cover.

The Final Order requires that Sandia perform a review for the feasibility of excavation “every five years” that would include public review and comments. The Final Order requires the Fate and Transport Model (FTM) be updated, review of the reliability of the dirt cover and groundwater monitoring.

The Final Order requirement for reviews every five years arose from the Hearing Officer Report that was adopted by the NMED Secretary in the Final Order. The Hearing Officer stated

([http://www.nmenv.state.nm.us/HWB/SNL/MWL/Final\\_Decision/Hearing\\_Off\\_Rprt\\_Findings\\_Fact\\_Conclusion\\_Law\\_\(05-20-2005\).pdf](http://www.nmenv.state.nm.us/HWB/SNL/MWL/Final_Decision/Hearing_Off_Rprt_Findings_Fact_Conclusion_Law_(05-20-2005).pdf), p.37):

“Two things can assist in understanding what is happening in the landfill in the future: a comprehensive model (discussed below), and continued monitoring and evaluation. I recommend that the Secretary require Sandia to prepare a report **every 5 years** re-evaluating the feasibility of excavation and analyzing the continued effectiveness of the selected remedy, as suggested by the Albuquerque-Bernalillo County Groundwater Advisory Board. The report should be presented in a public forum, and the public should have an opportunity to evaluate and comment on data presented. The report need not be of the magnitude of a full-scale RFI or CMS; NMED staff should determine what should be included, with input from Sandia and the public.” (Emphasis supplied).

The Hearing Officer additionally stated (p. 38-39):

“In the process of presiding over this hearing, I was impressed with the level of participation of the public and Citizen Action, with their technical knowledge and understanding, and their detailed study of the history of this landfill. Their presence and participation resulted in a more thorough and comprehensive review of the landfill and proposed permit modification. The public and Citizen Action demonstrated over and over that these issues are of passionate importance to them, and they should be allowed to continue to participate in the process of review as the remedy for the landfill is implemented. It is particularly important for the public to be able to participate in identifying the triggers for future action, and **5-year evaluations of feasibility of excavation and continued effectiveness of the selected remedy**. This will ensure that if the selected remedy is not effective, not properly implemented or maintained, or if new or not-predicted conditions or issues arise, they will be brought to NMED's attention and addressed.” (Emphasis supplied).

A May 27, 2005 NMED Press Release (John Goldstein NMED Communications Director) entitled *Environment Secretary Ron Curry Approves Remedy for Mixed Waste Landfill at Sandia National Laboratories* stated

<http://www.nmenv.state.nm.us/OOTS/PR/MWL%20Remedy%20PR.pdf> :

“Finally, Sandia must prepare a report every five years that reevaluates the feasibility of excavations and analyzes the continued effectiveness of the remedy.”

During the negotiations for the SNL MWL dump FTM, the New Mexico Environment Department sued Citizen Action to keep a 2006 TechLaw, Inc. report secret until November 2009 until after the dirt cover was constructed. Had the TechLaw, Inc. report been timely provided to Citizen Action and the public, the negotiations with NMED for the dirt cover would likely have had a different outcome.

The TechLaw, Inc. report reviewed the FTM and revealed flaws in the dirt cover construction for long term protection, poor monitoring capability for the cover and rejected the SNL FTM computer modeling for movement of the dump’s wastes as a “black box” that should not be used. Nevertheless, NMED used the flawed SNL FTM computer model in written comments to wave aside public concerns about MWL wastes reaching groundwater. NMED also withheld the TechLaw report from the EPA Inspector General audit team.

The FTM has not been updated as required by the Final Order. The original badly flawed FTM was not issued to the public for review and the concerns in the 2006 TechLaw, Inc. report were concealed during discussions for the FTM. Even more egregious was that the FTM was based on the flawed data from the groundwater monitoring network and ignored the evidence that contamination from the dump already had reached the groundwater. Accurate groundwater monitoring data was required before the FTM was written. This is an example of waste, fraud and abuse.

In February 2007 Citizen Action made a motion for reconsideration of the remedy decision for the SNL MWL dump based on evidence that the monitoring well network was known to be defective along with the FTM. The motion stated that

“Both NMED and SNL/DOE have known, but did not inform the public or the Hearing Officer that: the MWL monitoring wells were not developed properly; not in the proper locations; that well screens were across differing strata; that a packer was not installed and after installation contaminants continued to leak from beneath the dump into the uppermost aquifer; that organic drilling fluids and bentonite muds were used which adsorb contaminants of concern; that wells are going dry, and; that purge to dry sampling methods would also destroy contaminants of concern including volatile organic chemicals, heavy metals and radionuclides, including Greater than Class C Waste and transuranics.”

NMED, SNL, and the DOE also failed to report exceedance of the EPA Maximum Contaminant Level for nickel contamination in groundwater to the public and the Hearing Officer during the 2004 proceedings although the contamination was known to be present for many years and increasing. The nickel groundwater contamination was not predicted by the SNL MWL FTM which called into question the accuracy of the FTM to predict groundwater contamination at the MWL from other hazardous and radioactive wastes in the unlined trenches and pits.

The information on the unreliable network of monitoring wells and the groundwater contamination from the nickel wastes in the MWL dump was omitted from presentation to the hearing officer in December 2004. The motion for reconsideration was denied by the NMED. The additional evidence revealed since the motion was filed confirms its facts and is even more compelling now.

In March 2007 Citizen Action and Registered Geologist Robert Gilkeson filed a complaint with the Environmental Protection Agency (EPA) Region 6 that the MWL dump monitoring well network was defective. A \$273,000 investigation (April 2010) by the EPA Office of Inspector General (IG) 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 EPA IG identified that Region 6 staff and unnamed Sandia personnel also questioned the dirt cover remedy decision.

The EPA IG pointed out that NMED and EPA Region 6 withheld information that the federal Resource Conservation and Recovery Act (RCRA) requires to be disclosed to the public. The EPA IG stressed that the deliberate withholding of necessary and significant information denied Citizen Action and members of the public the right to meaningful participation in the RCRA process. The EPA IG audit also found that the concerns for the MWL, contained in the *Oversight Report* were being kept secret from Citizen Action and the public because Region 6 administrators improperly stamped the Oversight Report "Confidential" so that the report was withheld under that national security classification.

NMED participated in the secrecy. The EPA IG stated that:

"For example, 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. Consequently, any resolution of the concerns is undocumented."

The EPA IG stated that "Region 6 Accepted NMED's Recommendations and Dismissed Its Own Concerns without Supporting Documentation":

"However, the Project Engineer for Sandia intentionally did not document concerns with NMED's management of the MWL monitoring wells specifically to withhold the information from the public. Therefore, the Chief of Federal Facilities Branch has no documentation to support the Region's acceptance of the NMED's recommendations."

<http://www.epa.gov/oig/reports/2010/20100414-10-P-0100.pdf>

<http://www.fas.org/sgp/othergov/ig-epa-reg6.pdf>

The confidential Oversight Report and interviews of the EPA IG with EPA Region 6 staff were recently obtained after a FOIA lawsuit was filed by Citizen Action. The FOIA lawsuit is not yet settled and more documents may issue. The EPA Region 6 Oversight Report was politically compromised. The procedures interviews between EPA IG auditors and EPA staff members reveal knowledge of defective groundwater monitoring at the SNL MWL dump and that NMED and EPA Region 6 deliberately teamed up to

withhold the information in the Oversight Report. Here is what an EPA Region 6 staff person ((b)(6) means name deleted) told the Inspector General in an October 15, 2008 interview:

(b)(6) stated that he did not have any prior connection with the site. In fact he does not report to (b)(6). He also stated that Region 6 had its results preconceived. Region 6 management did not want to NMED doing anything wrong. Therefore, management created a structure to ensure the appropriate outcome would result. Furthermore, as the writing and draft comments progressed to a final letter, the team was pushed more and more to agree with NMED's position. He also stated that the teams' initial evaluation would have changed the solution at Sandia MWL. NMED pushed extremely hard for EPA Region 6 not to even question the past results or the viability of past test results. Finally, he stated that CANM got short changed by Region 6.

(Text in the original).

The "solution" that would have been changed is the dirt cover remedy. The "past test results" were for groundwater samples from the unreliable monitoring wells that would not support the solution of the dirt cover remedy.

Unfortunately, some of the past and current NMED members were involved in the spectacular manipulation, omission, and withholding of highly relevant information for decision making for the MWL. This has carried over to the present day by the failure of the NMED Hazardous Waste Bureau to enforce the terms of the Final Order that require the 5-year excavation feasibility review for the MWL. NMED is radically departing from the procedures required by the federal RCRA to modify the Final Order before allowing another 5-year delay of the feasibility study and report for excavation. The public continues to be denied the due process for participation that was agreed in the Final Order.

EPA Region 6 has groundwater monitoring concerns in its 2007 confidential Oversight Report, many that are not addressed by the SNL proposed LTMMP. These include concerns for:

- Need for a monitoring well to be placed at the northern boundary of the MWL,
- Well MWL-MW1 should be replaced by a well nearby to monitor for nickel,
- Need for an additional monitoring well on the north side of the MWL because of the continued pumping of the aquifer by the City of Albuquerque,
- Vadose zone monitoring should be conducted,
- Use of improper purge to dry sampling method,
- Need for low flow sampling of the MWL monitoring wells,
- Incorrect hydraulic conductivity calculations for flow velocity at the MWL,
- Need for low level tritium testing,
- Improper drilling methods used for monitoring wells,
- Replacement of well MWL-MW2 on the north side of the MWL,
- The replacement well screen for well MWL-MW3 needed to be installed across the water table,
- Recommendation to plug and abandon well MWL-MW4 installed inside the MWL dump because of deep and improper placement of two screens with allowance of cross-flow of groundwater between the two screens. EPA 6 recommended replacement of well MWL-MW4 with a new well installed north of the MWL dump

(the unreliable well MW4 is still in place as part of the long term groundwater monitoring network).

- Well MWL-MW5 should be plugged and abandoned because screen is across two different strata and contaminated with grout used to seal the borehole.
- Lack of data for the speed of groundwater travel in the Ancient Rio Grande strata.
- Corrosion and incrustation of well screens has masked detection of groundwater contamination.
- Improper placement of the first background monitoring well MWL-BW1.
- The need for soil vapor sampling. (Later sparse soil vapor sampling in 2008 only went to a depth of 50 ft despite evidence of increasing levels of contamination for tritium and solvents (VOCs).

Withholding the EPA Region 6 technical concerns again damaged the public's ability to participate meaningfully in the decision making process for the MWL, as described in detail by the EPA IG audit.

Mr. Gilkeson's current findings are that all of the six contaminant detection monitoring wells in the current network (see Figure 9) require replacement because they do not produce usable data for 1) knowledge of the direction of groundwater flow at the water table or 2) knowledge of groundwater contamination. The only reliable monitoring well in the current network is the well MWL-BW2 installed for background water quality data.

The NMED SNL Consent Order requires replacement of the six monitoring wells because the intended purpose of the monitoring wells is to monitor at the water table. The July 2, 2007 letter by former HWB Chief James Bearzi required that "Each replacement well shall be installed to monitor groundwater at the water table." The new replacement wells MWL-MW7, -MW8, and -MW8 were installed with 30-ft long screens that sample groundwater 20 ft below the water table. The existing well MWL-MW4 also samples groundwater from ~20 ft below the water table.

New monitoring wells installed in 2008:

- Are too deep to monitor at the water table level, as was required, for detection of contamination.
- The well screens are too long at 30 feet. EPA recommends well screens no longer than 10 ft.
- The sampling is done improperly using purge to dry methods that destroy evidence of volatile organic compounds.
- The water levels in groundwater monitoring wells MW8 and MW9 are too low for taking reliable and representative samples. (Table 3.5.1-1 October 2011 in the LTMMP of 3/6/12). Both wells MWL-MW8 and -MW9 were purged to dryness along with well MWL-MW4, not meeting the purging requirement, as stated in the 2012 Annual Groundwater Monitoring Report -- for 2011 groundwater monitoring, section 4.4. The 2012 Annual report does not document that low flow purge methods have been followed as required in the LTMMP at p. F-6, Sample Collection. Low

flow purging and sampling was recommended by EPA Region 6 in its confidential Oversight Report.

- The currently installed monitoring wells are not usable to detect contamination of any type from the MWL including solvents, trace metals, nitrates, and the radionuclides in the inventory of buried wastes including plutonium and tritium.
- The Proposed Long-Term Monitoring and Maintenance Plan (LTMMP) does not provide a reliable network of monitoring wells for detection of contamination in the vadose zone nor in the two zones in the regional aquifer that are important to monitor. The upper zone is at the water table and the deeper zone is in the highly productive sand and gravel layers in the Ancestral Rio Grande (ARG) deposits.

Mr. Gilkeson especially notes that Section 4.6 of the Sandia April 2012 Annual Groundwater Monitoring Report shows a declining water table in wells MWL-MW7, -8 and -9 so that water levels in MW8 and MW9 are too low and no longer suitable for providing reliable and representative samples. The 30 ft long well screens for MW 7, 8 and 9 misrepresent the water table level and put the sampling results under the hydraulic influence of the higher permeability alluvial fan sediments that are part of the lower portion of the well screen. This indicates that there is dilution of samples from the commingling of water from the upper portion of the tight fine-grained strata that is draining down through the filter pack of MW7, 8 and 9 into the deeper portion of the aquifer. EPA Region 6, in its 2007 confidential Oversight Report, specifically pointed out this type of problem for MW4 that has a well screen similarly placed too low to sample at the water table. It is the reason EPA guidance reports for installation of monitoring wells require that monitoring well screens be no longer than 10 ft below the water table.

Mr. Gilkeson points out a very serious issue is that the potentiometric groundwater surface contour maps in the SNL proposed LTMMP and in the SNL 2012 Annual Groundwater Monitoring Report (see Figure 13 in this report) show a contour map for the groundwater flow direction below the SNL MWL dump as being toward the north-northwest. The contour map is not based on the elevation of the water table at the MWL. The contour map in Figure 13 is contrary to the knowledge from the early 1990s to 2008 for the flow of groundwater being to the south-southwest.

The EPA Region 6 confidential Oversight Report on page 7 states that the flow of groundwater at the water table is to the west-southwest as follows:

The [groundwater] flow directions are different for each aquifer. The *AF* [alluvial fan] aquifer flow direction is to the west-southwest (based on our review of over 15 years of data), while the [deeper]ARG aquifer flow direction is to the west-northwest (based on USGS intonation and the Sandia 1990 to 2001 Groundwater Reports).

The 15 years of data on the west-southwest direction of groundwater flow in the *AF* sediments was obtained from monitoring wells MWL-MW1, -MW2, -MW3 and -BW1 that were installed with screens at the water table (see Figures 10 and 12).

An apparent scheme by DOE/SNL to conceal the southwest direction of groundwater flow below and away from the SNL MWL dump was the “regional groundwater flow map” presented in the 2002 DOE/SNL Mixed Waste Landfill Groundwater Report, 1990 through 2001 by Goering et al. The northwest groundwater flow in the regional groundwater flow map in Goering et al., was based on water levels measured in April 2000 in wells that are located over a mile away from the MWL dump (see Figure 11).

However, the water levels measured in the monitoring wells located close to the MWL dump in April 2000 (wells MWL-MW1, -MW2, -MW3 and -BW1 on Figure 12) determined that the direction of groundwater flow at the water table below and away from the MWL dump was to the southwest in agreement with the southwest direction of groundwater measured in 1997 for a groundwater flow map in the NMED Administrative Record. Nevertheless, the NMED made a serious mistake to approve the “regional” groundwater flow map in Goering et al., (2002) as accurate to show groundwater flow at the MWL dump. Revisions of the “regional” flow map in Goering et al., (2002) were used in DOE/SNL groundwater reports up to 2008 to make an incorrect finding that groundwater flow at the water table below the SNL MWL dump was to the northwest.

However, if the groundwater flow map in the DOE/SNL proposed LTMMP is accepted as accurate, then a large part of the SNL MWL dump is not monitored for contamination to groundwater. This fact is illustrated by the groundwater flow lines drawn on the flow map in Figure 13. For example, Figure 13 shows that groundwater contamination from the Classified Area of the MWL dump is not monitored by the existing network of contaminant detection monitoring wells that include wells MWL-MW7, -MW8 and -MW9 located along the west side of the MWL dump.

Apparently, SNL is attempting to show they were right all along for the early positioning of the monitoring wells. But then, the flow map in the SNL proposed LTMMP and in the SNL 2012 Annual Groundwater Monitoring Report show that the current monitoring wells do not monitor groundwater contamination from a large area of the MWL dump.

SNL and the NMED must know that the data from the existing monitoring well network is highly flawed because of the facts presented in this letter report. Nevertheless, SNL continues to submit the false data and NMED continues to accept the false data for decision making. Moreover, the record of the prior defective groundwater monitoring has not been corrected as is required by RCRA.

Tritium was identified as the primary contaminant of concern and VOCs such as PCE are also present. The purge to dry, high flow sampling methods and deep water levels with commingled water create diluted sampling results differing from what is at the water table.

The fact that heavy metals and solvents are found at depths well below the bottoms of the shafts and trenches at the MWL indicates that there is a release of RCRA wastes for which corrective action of removal or treatment must be performed. There has not been corrective action.

Due to many of the problems cited above in the 2010 Gilkeson report, Dr. Ines Triay, former DOE EM Director, agreed to have an independent review of the MWL performed by the Consortium for Risk Evaluation and Stakeholder Participation (CRESP). After Dr. Triay left DOE EM, Frank Marcinowski “deferred” the CRESP review although the review team members were selected and funds were available. One DOE reason for deferral of the independent CRESP review was that the SNL MWL dump 5-year review was to take place. That didn’t happen.

In conclusion, we respectfully ask that you:

- 1) Reconsider and reopen the decision of the dirt cover remedy for taking new evidence.
- 2) Enforce the 5-year review requirement and provide an independent review team.
- 3) Issue a stay for approval of the SNL proposed Long Term Monitoring and Maintenance Plan until after the 5-year review process is undertaken and updated monitoring results are provided after the installation of a reliable network of groundwater monitoring wells.

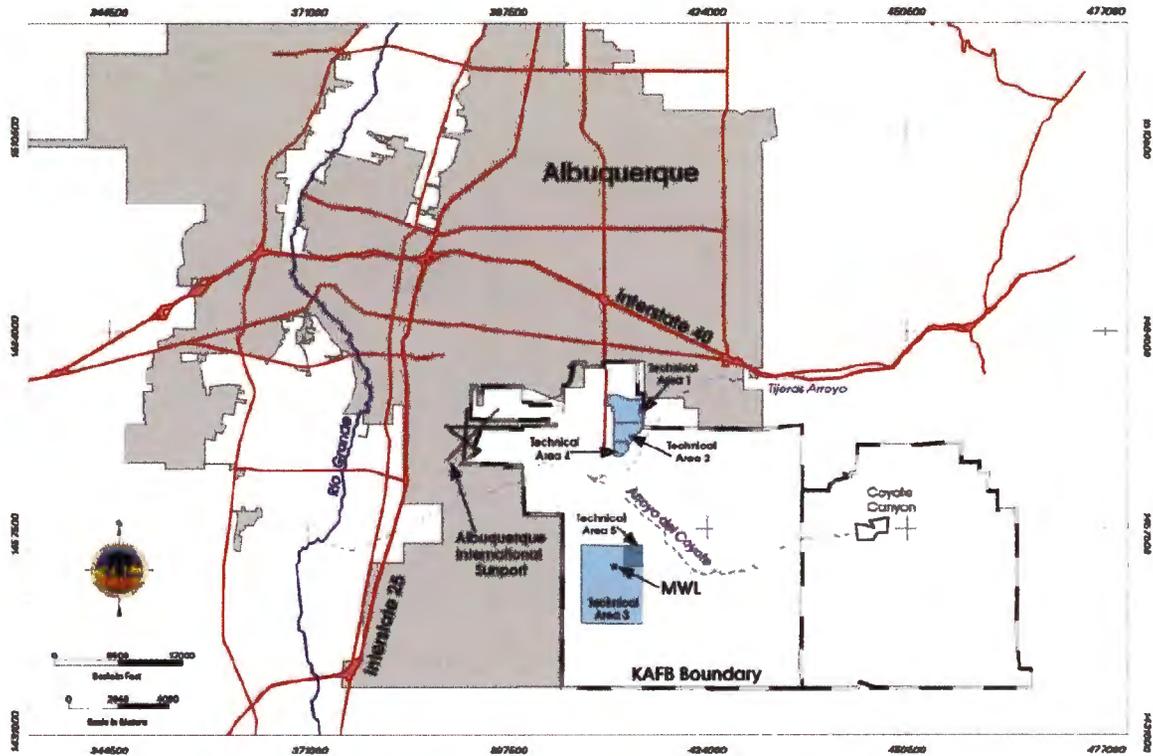
Sincerely,

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**Figure 1. Location of the SNL Mixed Waste Landfill (SNL MWL dump) in SNL Technical Area 3 at Albuquerque, New Mexico.**



**Note:** The SNL Mixed Waste Landfill (MWL on the figure) is located approximately 5 miles southeast of the Albuquerque International Airport and approximately 1 mile east of the new Mesa del Sol Subdivision and Business Park.

**Source:** Figure 1-1 in *Mixed Waste Landfill Corrective Measures Implementation Report*, January 2010 Sandia National Laboratories/New Mexico Environmental Restoration Project.

**Figure 3. Aerial view of the SNL MWL dump looking to southwest circa 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.**

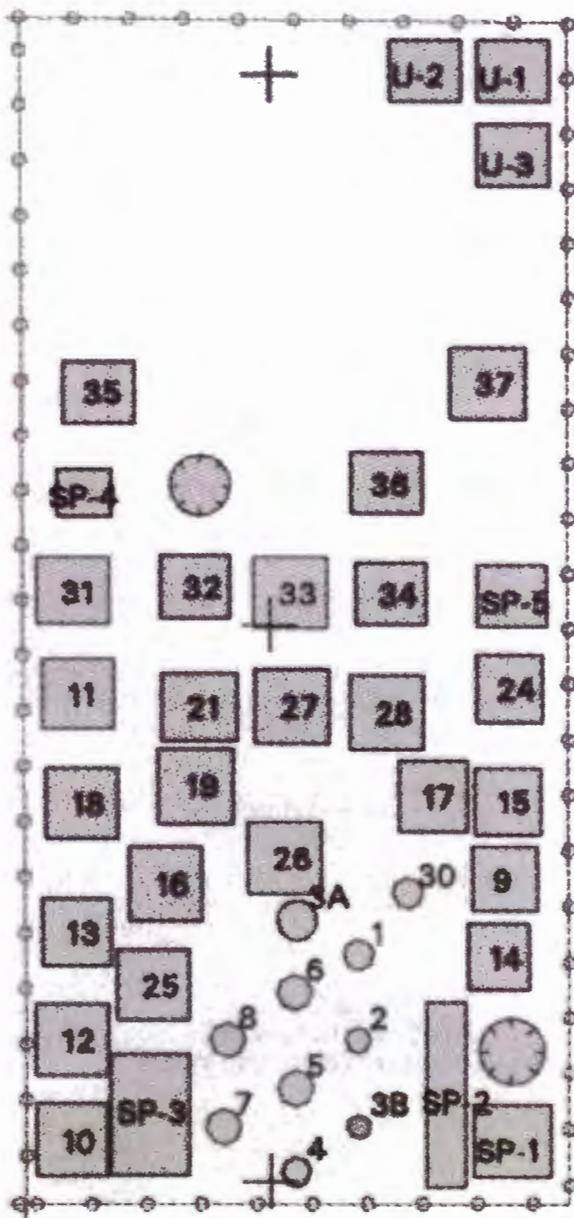
**Figure 5. View of drummed “Lovelace wastes” disposed of in Trench E of the SNL MWL dump in May 1980.**



**Source: Figure 5 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.**

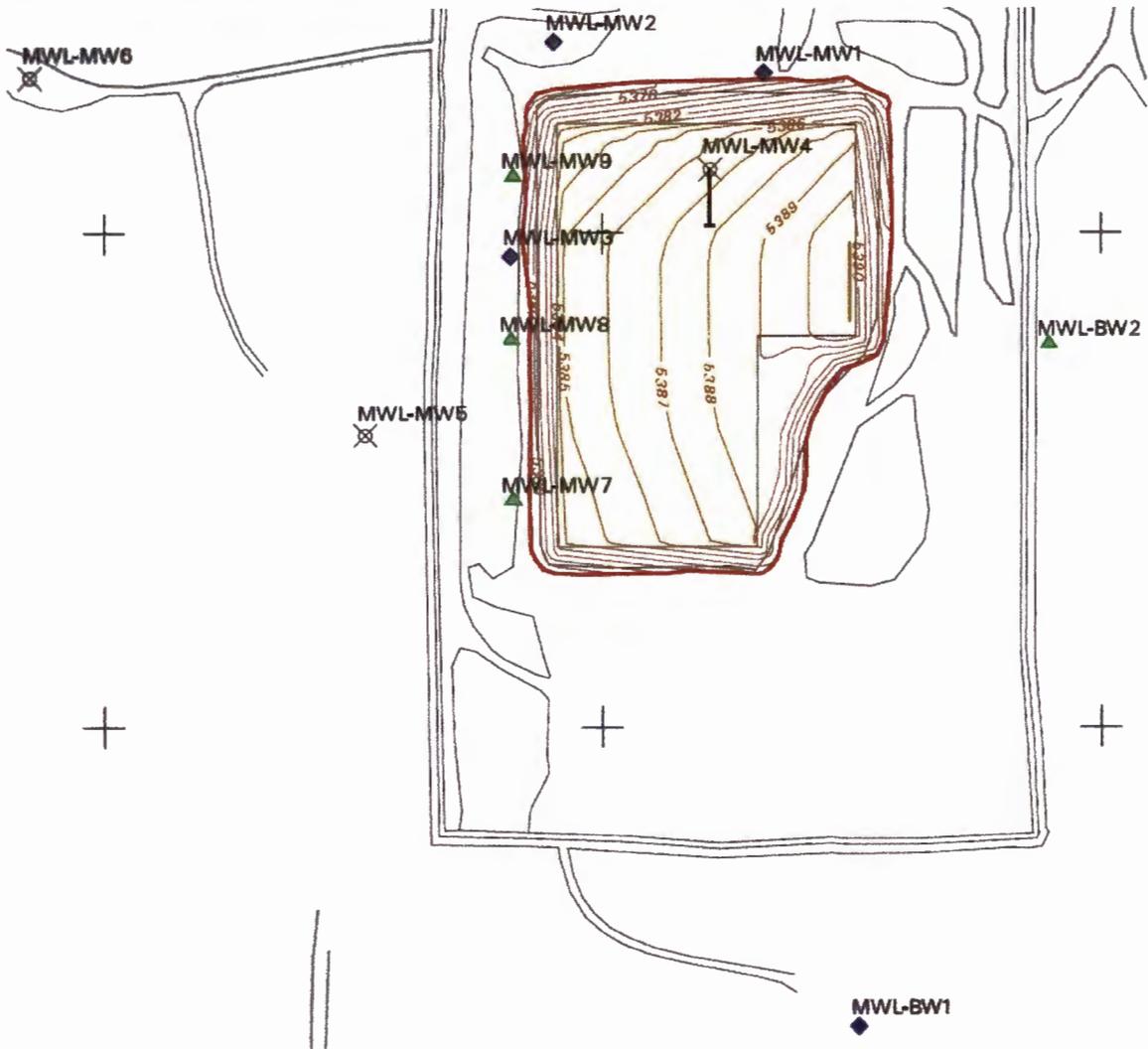
Figure 7. The disposal pits in the Classified Area of the SNL MWL dump.

- A large and unknown quantity of liquid wastes including solvents was disposed of in pit SP-1.
- The inventory of tritium wastes in the Classified Area was > 1450 curies.
- The pits were not sealed to prevent inflows of large quantities of storm water.
- The SNL proposed MWL LTMMP does not monitor groundwater contamination from the Classified Area (See Figure 13).



Source: Figure 2 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 9. Location of the new defective detection monitoring wells MWL-MW7, -MW8 and -MW9 along the western boundary of the Sandia MWL Dump and new background monitoring well MWL-BW2 200 feet east of the MWL Dump.**



**Legend**

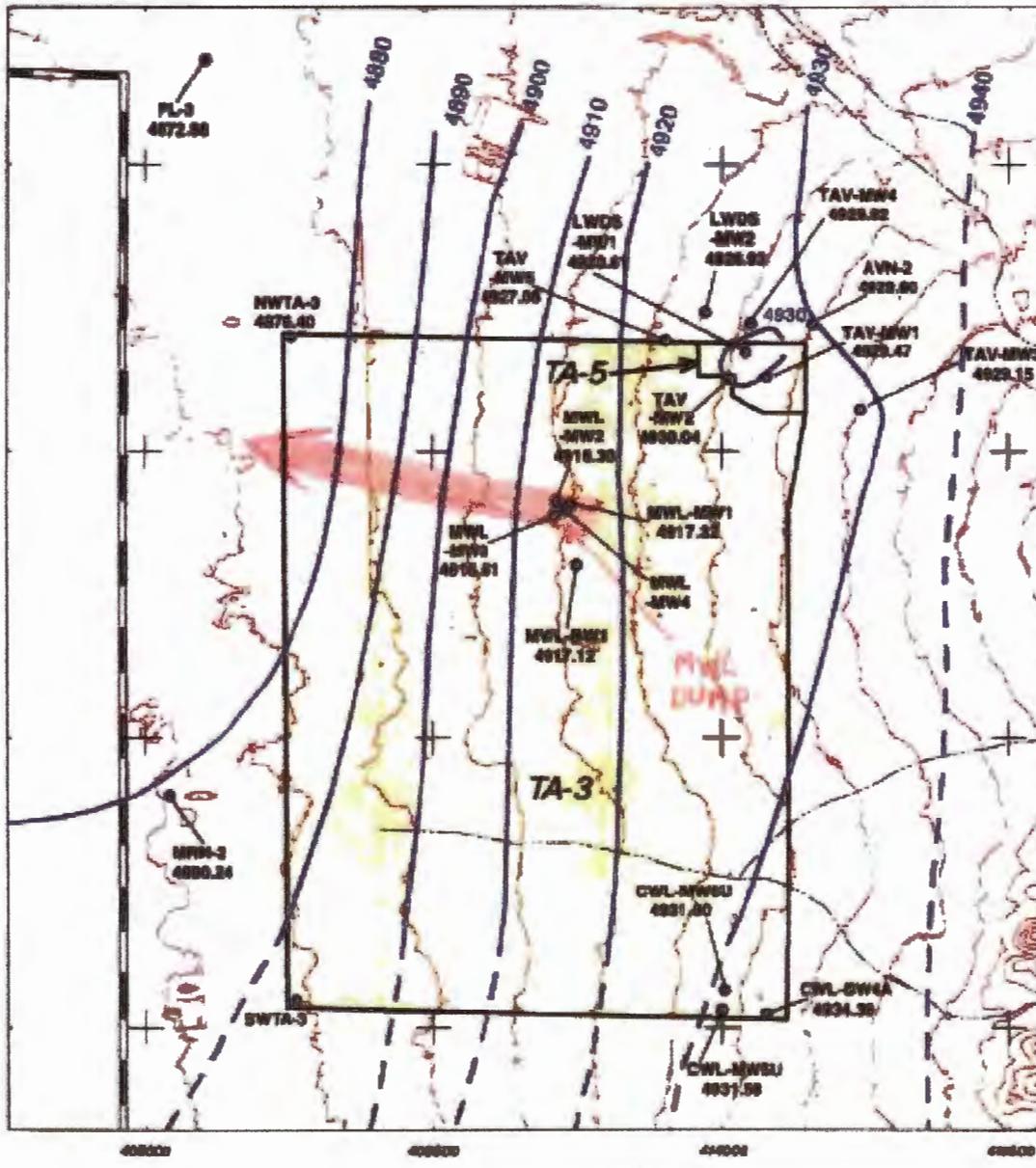
- ▲ Recently Installed Groundwater Monitoring Well
- ◆ Recently Plugged and Abandoned Groundwater Monitoring Well
- ⊗ Groundwater Monitoring Well MWL-MW4 (showing horizontal extent)
- ⊗ Groundwater Monitoring Well
- - - 1-ft Contour Interval for Proposed Soil Cover
- Toe of Proposed Soil Cover

**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 11. "Figure 3-12. Regional Water Table Map for Technical Areas 3 and 5, April 2000" in DOE/SNL Mixed Waste Landfill Groundwater Report, 1990 through 2001 by Goering et al., (2002).

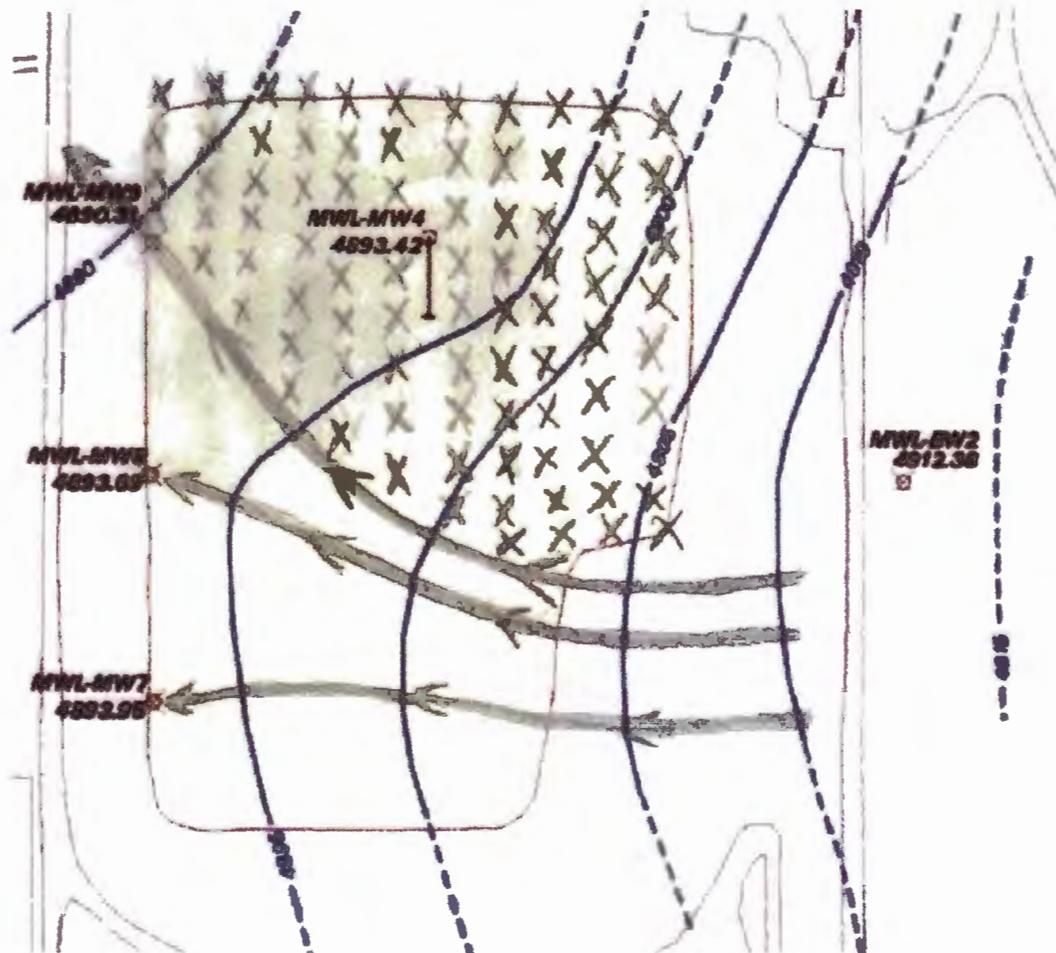
- The red flow line shows the northwest direction of groundwater flow based on the inappropriate use of groundwater elevations measured in wells located miles away from the SNL MWL dump.
- However, the water table elevations measured in the monitoring wells located close to the MWL dump show the direction of groundwater flow below and away from the dump is to the southwest (see Figure 12).



**Legend**

● Monitoring Well Groundwater Elevation  
(feet above mean sea level)

Figure 13. "Figure 4-3. Localized Potentiometric Surface of the Basin Fill Aquifer at the Mixed Waste Landfill, October 2011" in SNL Annual Groundwater Monitoring Report Calendar Year 2011.



The arrowed lines show the direction of groundwater flow for the groundwater piezometric surface map in the SNL MWL dump proposed Long Term Monitoring and Maintenance Plan (LTMMP).

The large region marked with X's shows that the SNL MWL proposed LTMMP does not have any monitoring wells at appropriate locations to detect groundwater contamination from the northern region of the SNL MWL dump.

The Classified Area of the SNL MWL dump (see Figures 2 and 7) is not monitored for groundwater contamination. The NMED August 11, 2004 MWL Fact Sheet states that "The classified area contains wastes that in all likelihood present the greatest security, worker safety, and environmental concerns. Wastes in the classified area include military hardware, radioactive constituents (e.g., cobalt-60, cesium-137, tritium, radium-226), activation products (e.g., cobalt-60), multiple fission products (e.g., cesium-137, strontium-90), high specific-activity wastes (e.g., tritium, cobalt-60), plutonium, thorium, and depleted uranium."