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CERTIFIED MAIL - RETURN RECEIPT REQUESTED

October 10, 2008

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Francis B. Nimick
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RE: NOTICE OF DISAPPROVAL: MIXED WASTE LANDFILL CORRECTIVE MEASURES IMPLEMENTATION PLAN, NOVEMBER 2005
SANDIA NATIONAL LABORATORIES, NM5890110518
SNL-05-025

Dear Ms. Wagner and Mr. Nimick:

The New Mexico Environment Department (NMED) has reviewed the U.S. Department of Energy/Sandia Corporation's (Permittees) responses to the NMED's Notice of Disapproval (NOD) issued on November 20, 2006 for the Sandia National Laboratories Mixed Waste Landfill (MWL) Corrective Measures Implementation (CMI) Plan. The Permittees responses were submitted in two parts, dated December 15, 2006, and January 19, 2007. Based on our review of these responses, NMED has identified several deficiencies that require additional information or resolution. The deficiencies are described in the comments below.

Part 1 Comments

1. In response to NOD Comment 17, Permittees state that "[t]he mature, secondary plant community will be achieved when greater than 50% of the photosynthesizing foliar coverage is comprised of grass species native to the general TA-III area". Russian thistle (tumbleweed) should not be allowed to be a part of the foliage on the cover and should not count as part of the foliar coverage used as a measure for acceptable establishment of

vegetation. NMED expects any tumbleweed that grows on the cover to be removed periodically as part of long-term maintenance.

2. Also in response to NOD Comment 17, the Permittees did not indicate the extent of foliar coverage that would represent acceptable establishment of vegetation on the final landfill cover. Propose a percentage of foliar cover relative to the total surface area of the landfill cover that will be considered as representative of acceptable establishment of foliage. Indicate also the size (in square feet) of any barren areas that would be considered unacceptable and would thus require re-seeding and/or other corrective measures to improve the foliar coverage of the barren areas.

Part 2 Comments

1. In response to NOD Comment 4, the Permittees state that future infiltration rates through the MWL cover (based on the natural analogue) would be less than the current infiltration rates (based on the engineered cover). This reduction in future infiltration rates presumably is due to increased evapotranspiration caused by increasing porosity and hydraulic conductivity of the landfill cap as it reverts to natural soil conditions. While this process may occur, it is not clear how this conclusion was reached. Clarify if the anticipated increase in evapotranspiration is based on empirical data (i.e., actual infiltration and/or groundwater recharge data from areas with natural soil), modeling simulations, or another method.

2. In response to NOD Comment 6, Section 4, Pages E-59 and E-59a, the Permittees indicate that monitoring triggers are considered preliminary and are to be finalized in the Long-Term Monitoring and Maintenance Plan (LTMMP). This is not an acceptable approach, as the NMED Secretary's Final Order issued on May 25, 2006 requires that the triggers be developed as part of the CMI Plan. The relevant part of the Final Order states: "As part of the Corrective Measures Implementation Plan that incorporates the remedy (described in the draft permit modification in Paragraph V.3), Sandia shall additionally include the following: ..., b) triggers for future action, that identify and detail specific monitoring results that will require additional testing or the implementation of an additional or different remedy."

   Although the trigger levels and the environmental media that they apply to must be established as part of the CMI Plan, the specific methods, locations, and frequencies of monitoring, and other related details can be established through approval of the LTMMP. Trigger levels, once accepted by the NMED through its review and approval of the CMI Plan, must be incorporated into the proposed LTMMP.

   Additionally, the trigger evaluation process described in Section 4 and in Figure E-25 (of pages E-59 and E-59a), and as revised by the Permittees' response, is not an acceptable approach. In NOD Comment 6, and again through this Notice of Disapproval, the Permittees are instructed to revise the trigger evaluation process to follow the corrective

action process described in the Consent Order (April 29, 2004) if a trigger level is exceeded, provided the Consent Order is still in force at the time. If the Consent Order has terminated, the trigger evaluation process should follow the corrective action process described in the Facility Permit. The Permittees should repeat sampling to confirm if a trigger level has been exceeded. Repeat sampling should be the primary means to avoid implementation of corrective action based on false positives.

3. In NOD Comment 9, the NMED concluded that the neutron probes will only be able to evaluate soil moisture at depths in the vadose-zone that are considerably deeper than the base of the soil cover. Because it would take substantial time for moisture to move through the vadose zone to the depths of the neutron probe access tubes, and because the current design does not monitor for breakthrough of moisture from the cover to the waste, NMED does not agree that such moisture monitoring offers the best possible design for an early warning system. Thus, NMED will place more emphasis on other types of monitoring in the LTMMP. No response is required by the Permittees for this comment.

4. In NOD Comment 14, the Permittees indicate that soil samples from animal burrows and ant hills will be collected every five years. NMED believes that every five years is too long of an interval between sampling events given that the MWL remedy and fate and transport model are to be re-evaluated every five years in accordance with the Final Order. The Permittees' current proposal involves only one round of sampling results to be available for each five year re-evaluation. The Permittees must propose a sampling frequency with a shorter interval between sampling events.

5. In NOD Comment 15, NMED indicated that soil gas in the vadose zone was to be monitored for tritium, radon, PCE, and total VOCs. The Permittees plan to install a FLUTe™ vadose zone soil-gas monitoring system around the MWL for VOCs, and propose trigger levels of 20 parts per million by volume (ppmv) for trichloroethylene (TCE) and tetrachloroethylene (PCE), and 25 ppmv for total VOCs to ensure protection of groundwater. However, the Permittees did not agree to monitor for tritium or radon in soil gas on the basis that the data would be of limited value, and that NMED did not have the authority to require monitoring of these radioactive constituents. Note that the U. S. Environmental Protection Agency (EPA) and NMED regulates gross beta in groundwater through drinking water standards. Tritium and some isotopes of radon are beta emitters. Furthermore, NMED disagrees that the data would be of limited value, as NMED believes that concentration trends are useful indicators of contaminant migration. Thus, NMED expects the Permittees to monitor for tritium and radon in soil gas in the vadose zone. The Permittees must specify trigger levels for radon and tritium for soil gas in the vadose zone.

6. In NOD Comment 19, NMED asked that the Permittees propose additional monitoring points at locations (surface and subsurface) within the landfill where contaminants were detected at their highest levels during the RCRA Facility Investigation of the MWL. No additional sampling was proposed by the Permittees, chiefly on the basis that intrusive

monitoring techniques could possibly compromise cover integrity. However, NMED believes that additional monitoring points can be located within the landfill, and that such monitoring can be conducted without necessarily driving heavy vehicles over the landfill surface. The Permittees shall propose additional monitoring points at locations within the landfill where radon, tritium, and VOCs were detected at their highest levels during the RCRA Facility Investigation. These monitoring locations should consider air, surface soil, and subsurface soil as media to be monitored.

7. In NOD Comment 18, and in Table 2 of the Permittees' January 19, 2007, responses to the NOD for Comment 20, Permittees did not agree to lower the trigger levels for the VOCs 1,1,1-TCA, ethylbenzene, styrene, toluene, and total xylenes (in groundwater). The Permittees continue to propose trigger levels based on one-half of the value of EPA Primary Drinking Water Standards, and state that there are no regulatory or technical reasons for further reducing the trigger levels for these VOCs. The Permittees also argue that there are analytical difficulties with measuring low concentrations of VOCs in groundwater which could lead to false detections of contaminants.

   NMED finds that some of the proposed trigger levels are unacceptable because they fall within three general categories: a) they fail to take into account Consent Order (April 29, 2004) requirements for groundwater cleanup levels; b) they are erroneous; or c) they do not address all constituents of concern for the MWL. These deficiencies are discussed more specifically below. NMED also proposes alternative trigger levels for those considered to be unacceptable in the tables provided below.

   A. Consent Order Requirements for Cleanup Levels

   The Permittees assert that regulations do not require the cleanup of groundwater to concentrations that are below water quality standards; hence, setting trigger levels at one-half the water quality standard is adequate to protect groundwater. However, NMED may require corrective action at any solid waste management unit (SWMU) as necessary to protect human health and the environment from releases (20.4.1.500 NMAC incorporating 40 CFR 264.101). This is true even in cases where groundwater is known to be contaminated at levels below water quality standards. Additionally detection and prevention of the contamination of groundwater at any concentration should be the main goal of long-term monitoring at the MWL.

   Any given trigger level applicable to groundwater beneath the MWL should be based on the appropriate water quality standard, which in general will be the most stringent of a state or federal standard for the constituent of interest. Section VI.K.1.a of the Consent Order states that "[g]roundwater cleanup levels are based on the WQCC standards and the EPA MCLs for drinking water Contaminants. If both a WQCC standard and a MCL have been established for an individual substance, then the most stringent of the two levels shall be considered the cleanup level for that substance…If a WQCC standard or MCL has not been established for a specific substance, the EPA Region VI Human

Health Medium Specific Screening Level for tap water shall be used as the screening level".

The purpose of establishing trigger levels is to provide for early warning of any unexpected releases so that action can be taken to prevent groundwater contamination, and especially to prevent contamination from exceeding a water quality standard. Groundwater investigations can take considerable time to complete; often such investigations may take many years. Thus, to be useful as part of an early warning system, trigger levels are generally set much lower than their corresponding standards, and especially in cases where standards are much higher than laboratory analytical detection limits.

For these reasons, NMED believes one-half of a water quality standard is too high for a trigger level for a given groundwater constituent where the standard is greater than about 0.040 mg/L. In cases where the standard is greater than 0.040 mg/L, NMED proposes that the trigger level for a groundwater constituent should be set at one-quarter (25%) of the standard, which should be sufficiently higher than most detection limits such that false positives should be uncommon. However, in the case of naturally occurring constituents, it may be necessary to set the trigger level to corresponding background levels whenever 25% of the standard falls below the approved maximum background concentration for the area.

The trigger levels for 1,1,1-TCA; 1,1-dichloroethene, toluene, vinyl chloride, total xylenes, chlorobenzene, ethylbenzene, styrene; cis 1,2 – dichloroethene; trans 1,2-dichloroethene, and method 8260 VOCs in groundwater are not acceptable as they are not based on the lowest concentration of the applicable EPA MCL, WQCC standard, or if an applicable MCL or WQCC standard does not exist, the applicable EPA Region 6 Human Health Medium Specific Screening Level for tap (residential) water. NMED proposes alternate trigger levels for these constituents in the table below. The NMED's proposed alternate trigger levels should be incorporated into Table E-6 of Appendix E of the CMI Plan.

Environmental Medium	**Parameter**	**NMED proposed trigger level**	**Comments**
Groundwater	1,1,1-TCA	0.015 mg/L	25% of WQCC standard (0.060 mg/L)
Groundwater	1,1-dichloroethene	0.0025 mg/L	50% of WQCC standard (0.005 mg/L)
Groundwater	toluene	0.1875 mg/L	25% of WQCC standard (0.750 mg/L)
Groundwater	vinyl chloride	0.0005 mg/L	50% of WQCC standard (0.001 mg/L)
Groundwater	total xylenes	0.155 mg/L	25% of WQCC standard (0.620 mg/L)

Groundwater	chlorobenzene	0.025 mg/L	25% of EPA MCL
Groundwater	ethylbenzene	0.175 mg/L	25% of EPA MCL
Groundwater	styrene	0.025 mg/L	25% of EPA MCL
Groundwater	cis 1,2 - dichloroethene	0.0175 mg/L	25% of EPA MCL
Groundwater	trans 1,2-dichloroethene	0.025 mg/L	25% of EPA MCL
Groundwater	method 8260 VOCs	50% of the most stringent of EPA MCL, WQCC standard, or EPA Region 6 Human Health Medium Specific Screening Level for tap water, as applicable. Trigger level to be set at 25% of standard if the standard is greater than 0.040 mg/L.	As explained in the column to the left.

B. Erroneous Trigger Levels

The trigger levels for cadmium and mercury in surface soil are not acceptable for the reasons indicated in the column for "Comments" in the following table. NMED also proposes alternate trigger levels for these constituents in the following table. The alternate trigger levels are based on NMED industrial/occupational soil screening levels. The NMED's proposed alternate trigger levels should be incorporated into Table E-6 of Appendix E of the CMI Plan.

Environmental Medium	**Parameter**	**NMED proposed trigger level**	**Comments**
Surface soil	cadmium	564 mg/kg	Screening value was listed incorrectly in Table 2.
Surface soil	mercury	6.84 mg/kg	Screening value for methyl mercury is more conservative. Use of elemental mercury not supported

			by waste inventory.

C. Additional Metals of Concern at the MWL

For each given medium listed in the left-most column of the table below, add the following additional constituents and their corresponding trigger levels to Table E-6 of Appendix E of the CMI Plan. The trigger levels for soil are based on NMED industrial/occupational soil screening levels. The NMED's proposed additional trigger levels should be incorporated into Table E-6 of Appendix E of the CMI Plan.

Environmental Medium	**Parameter**	**NMED proposed trigger level**
Surface soil	Copper	45,400 mg/kg
Surface soil	Nickel	22,700 mg/kg
Surface soil	Vanadium	1,140 mg/kg
Surface soil	Zinc	100,000 mg/kg
Surface soil	Cobalt	20,500 mg/kg
Surface soil	Beryllium	2,250 mg/kg
Groundwater	Chromium (total)	0.043 mg/L (background)
Groundwater	Cadmium	0.0025 mg/L (50% of EPA MCL)
Groundwater	Nickel	0.050 mg/L (25% of WQCC standard of 0.2 mg/L)
Groundwater	Dichlorodifluoromethane	0.0975 mg/L (25% EPA Region 6 screening level for compound)
Groundwater	tritium	4 mrem/year (EPA MCL)
Groundwater	radon	300 pCi/L (proposed EPA MCL)

The Permittees are required to address these comments within 60 days of receipt of this letter. Please contact William Moats of my staff at (505) 222-9551 if you have any questions.

Sincerely,

James P. Bearzi
Chief
Hazardous Waste Bureau

cc: J. Kieling, NMED, HWB

W. Moats, NMED, HWB
L. King, EPA-Region 6 (6PD-N)
J. Gould, DOE/NNSA/SSO, MS 0184
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