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**CERTIFIED MAIL
RETURN RECEIPT REQUESTED**

May 28, 2003

Mr. G. Pete Nanos, Interim Director
Los Alamos National Laboratory
P.O. Box 1663, Mail Stop A100
Los Alamos, New Mexico 87545

Mr. David Gregory, Project Manager
Office of Los Alamos Site Operations
Department of Energy
528 35th Street, Mail Stop A316
Los Alamos, New Mexico 87544

**SUBJECT: RESPONSE AND COMMENTS FOR DIESEL SPILL LOCATED AT
TECHNICAL AREA 21-57.
LOS ALAMOS NATIONAL LABORATORY EPA ID# NM0890010515**

Dear Messrs. Nanos and Gregory:

The New Mexico Environment Department (NMED) is in receipt of Los Alamos National Laboratory and U.S Department of Energy's (Permittees') report dated September 19, 2002 and, titled "TA-21-57 AST Diesel Fuel Oil Environmental Assessment and Characterization Report" referenced by LA-UR-02-4007 (RRES-WQH: 02-356) and "TA-21-57 Aboveground Storage Tank Diesel Release, Tier 1 Evaluation," dated March 26, 2003 and referenced by RRES-WQH: 03-068. NMED has conducted a review of the aforementioned documents and has determined that additional characterization to define the nature and extent of diesel contamination at the site is required. NMED is providing the following rationale for its determination that additional characterization is required:

- Fractures were observed in boreholes installed during assessment activities conducted at the site. Although fracture flow is identified as a potential contaminant migration pathway, fracture flow at the site is not fully evaluated. The September 2002



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Characterization Report contains assumptions regarding fracture flow at the site but does not provide data to support the fracture flow assumptions. NMED does not believe diesel migration by fracture flow has been thoroughly evaluated. Every attempt should be made to characterize the nature and extent of subsurface contamination related to fractures.

- Vertical and horizontal extent of diesel contamination at the site has not been defined. Vertical borehole designated V1 was drilled to a total depth (TD) of approximately 175 feet below ground surface (bgs). At the TD of this borehole analytical data indicated a total petroleum hydrocarbon (TPH) diesel range organic concentration of 1,700 milligrams per kilogram (mg/kg). Data collected from borehole V1 indicates a TPH as diesel concentration of 22,300.00 mg/kg at a depth of 145 feet bgs. Although data collected from borehole V1 indicates a decreasing vertical concentration trend for TPH as diesel, no other borehole installed at the site during investigation activities was completed to depths greater than 125 feet bgs. Based on the borehole data collected during investigation activities conducted at the site, NMED has determined that additional boreholes are required to determine the nature and extent of diesel contamination at the site. Additional boreholes must be installed to a minimum depth of 145 feet bgs. If TPH as diesel is detected at or above 880 mg/kg at or below 145 feet bgs, the borehole must be installed until concentrations of TPH as diesel are less than the NMED soil screening guidelines for TPH. Soil screening for TPH must be conducted in accordance with "New Mexico Environment Department TPH Screening Guidelines, February 28, 2003 Draft TPH Guidelines). A copy of the guidance is attached and can be accessed on the NMED website (<http://www.nmenv.state.nm.us/HWB/guidance.html>).
- A photo-ionization detector (PID) was used to guide drilling activities. The use of a PID to guide sample collection for laboratory analysis or to determine when to discontinue drilling activities is not appropriate for investigation of diesel or heavier range petroleum-related contamination. Diesel is not as volatile as gasoline-range organics and, therefore, will not be accurately detected using a PID.

All future activities performed at the site should be conducted in accordance with the current Petroleum Storage Tank Bureau (PSTB) Regulations (20.5 NMAC), and guidelines put forth by the PSTB for a diesel release or spill where applicable. Since the Facility is a Resource Conservation and Recovery Act (RCRA) permitted Facility, reporting should also be consistent with RCRA corrective action requirements as applicable. The PSTB and the Hazardous Waste Bureau (HWB) will work jointly with LANL to ensure compliance with all applicable PSTB and RCRA Regulations.

NMED requires the Permittees to submit a sampling and analysis plan (SAP) for additional characterization activities to NMED HWB for review and approval on or before August 29,

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2003. Please provide in the SAP a plan to define nature and extent of subsurface contamination and investigate subsurface contamination related to fractures, the role in the transport of contaminants along fractures, and the impact of fracture flow on contaminant transport at this site. An alternate method for field screening should also be proposed. Visual, olfactory and use of immunoassay or other TPH field detection kit are appropriate mechanisms for field screening of diesel.

As discussed during a meeting between NMED and LANL staff on May 5, 2003, NMED is willing to discuss details of the SAP prior to submittal. Should you have any questions regarding this letter or the deadline outlined above, please feel free to contact either me at (505) 428-2546, or Lorena Goerger of the NMED PSTB at (505) 984-1941.

Sincerely,



Vickie Maranville
Project Manager
Permits Management Program

Attachment: New Mexico Environment Department TPH Screening Guidelines, TPH Guidelines, February 28, 2003.

cc: D. Cobrain, NMED HWB
J. Young, NMED HWB
L. Goerger, NMED PSTB
J. Davis, NMED SWQB
J. Parker, NMED DOE OB
S. Yanicak, NMED DOE OB, MS J993
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M. Saladen, RRES/WQH, MS K497
J. Hopkins, RRESR, MS M992
B. Ramsey, LANL RRES/ER, MS M992
N. Quintana, LANL RRES/ER, MS M992
G. Turner, DOE OLASØ, MS A316
File: Reading and LANL TA-21 (TA-21-57 AST Diesel Release)

NEW MEXICO ENVIRONMENT DEPARTMENT TPH SCREENING GUIDELINES

Some sites with areas of soil contamination resulting from releases of petroleum products such as jet fuel and diesel wish to use total petroleum hydrocarbon (TPH) sampling results to delineate the extent of petroleum-related contamination at these sites and ascertain if the residual level of petroleum products does not represent an unacceptable risk to future users of the site. TPH results represent a complex mixture of compounds, some of which are regulated constituents and some compounds that are not regulated. In addition, the amount and types of the constituent compounds in TPH differ widely depending on which petroleum product was spilled and how the spill has weathered. This variability makes it difficult to determine the toxicity of weathered petroleum products in soil solely from TPH results. **Therefore, remediation of spills and corrective action sites cannot be based solely on results of TPH sampling; these TPH guidelines must be used in conjunction with the screening guidelines for individual petroleum-related contaminants in Table 3 and other contaminants as applicable.**

The screening levels for each petroleum carbon range from the Massachusetts Department of Environmental Protection (MADEP) Volatile Petroleum Hydrocarbons/Extractable Petroleum Hydrocarbons (VPH/EPH) approach and the percent composition table below were used to generate screening levels corresponding to total TPH. Except for waste oil, the information in the compositional assumptions table was obtained from Table 5-1 of the Massachusetts Department of Environmental Protection guidance document *Implementation of the MADEP VPH/EPH Approach Final Draft June 2001*. TPH toxicity was based only on the weighted sum of the toxicity of the hydrocarbon fractions listed in Table 1.

Table 1: TPH Compositional Assumptions in Soil

Petroleum Product	C11-C22 Aromatics	C9-C18 Aliphatics	C19-C36 Aliphatics
Diesel #2/ new crankcase oil	60%	40%	0%
#3 and #6 Fuel Oil	70%	30%	0%
Kerosene and jet fuel	30%	70%	0%
Mineral oil dielectric fluid	20%	40%	40%
Unknown oil ^a	100%	0%	0%
Waste Oil ^b	0%	0%	100%

^a Sites with oil from unknown sources must be tested for VOCs, SVOCs, metals, and PCBs to determine if other potentially toxic constituents are present. The TPH guidelines in Table 2 are not designed to be protective of exposure to these constituents therefore they must be tested for, and compared to, their individual NMED soil screening guidelines.

^b Compositional assumption for waste oil developed by NMED is based on review of chromatographs of several types of waste oil. Sites with waste oil must be tested for VOCs, SVOCs, metals, and PCBs to determine if other potentially toxic constituents are present. The TPH guidelines in Table 2 are not designed to be protective of exposure to these constituents therefore they must be tested for, and compared to, their individual NMED soil screening guidelines.

A TPH screening guideline was calculated for each of the types of petroleum product based on the assumed composition from the above table for petroleum products and the direct soil standards incorporating ceiling concentrations given in the MADEP VPH/EPH Excel spreadsheet for each of the carbon fractions. Ground water concentrations are based on the weighted sum of the noncarcinogenic toxicity of the petroleum fractions assuming the water is drinking water.

Table 2: TPH Screening Guidelines

Petroleum Product	TPH		Concentration in Ground Water (mg/L)
	Residential Direct Exposure (mg/kg)	Industrial Direct Exposure (mg/kg)	
Diesel #2/crankcase oil	880	2200	1.8
#3 and #6 Fuel Oil	860	2150	1.4
Kerosene and jet fuel	940	2350	3.0
Mineral oil dielectric fluid	1560	3400	3.7
Unknown oil ^a	800	2000	2.3
Waste Oil ^b	2500	5000	Petroleum-Related Contaminants
Gasoline	Not applicable	Not applicable	Petroleum-Related Contaminants

Mineral oil based hydraulic fluids can be evaluated for petroleum fraction toxicity using the screening guidelines from Table 2 specified for waste oil, because this type of hydraulic fluid is composed of approximately the same range of carbon fractions as waste oil. However, these hydraulic fluids often contain proprietary additives that may be significantly more toxic than the oil itself; these additives must be considered on a site- and product-specific basis (see ATSDR hydraulic fluids profile reference). **Use of alternate screening guideline values requires prior written approval from the New Mexico Environment Department.** TPH screening guidelines in Table 2 must be used in conjunction with the screening levels for petroleum-related contaminants given in Table 3 because the TPH screening levels are NOT designed to be protective of exposure to these individual petroleum-related contaminants. Table 3 petroleum-related contaminants screening levels are based on the New Mexico Environment Department soil screening levels (NMED SSLs) released in December of 2000.

The list of petroleum-related contaminants does not include PAHs with individual screening levels that would exceed the total TPH screening levels (acenaphthene, anthracene, flouranthene, flourene, and pyrene). In addition, these TPH screening guidelines are based solely on human health, not ecological risk considerations, protection of surface water, or potential indoor air impacts from soil vapors. Potential soil vapor impacts to structures or utilities are not addressed by these guidelines. Site-specific investigations for potential soil vapor impacts to structures or utilities must be done to assure that screenings are consistently protective of human health, welfare or use of the property. NMED believes that use of these screening guidelines will allow more efficient screenings of petroleum release sites at sites while protecting human health and

the environment. Copies of the references cited below are available on the MADEP website at http://www.state.ma.us/dep/bwsc/vph_eph.htm and the NMED website at <http://www.nmenv.state.nm.us/HWB/guidance.html>.

Table 3. Petroleum-Related Contaminants Screening Guidelines

Petroleum-Related Contaminants	Values for Direct Exposure to Soil		NMED DAF 20 GW protection (mg/kg in soil)	NMED DAF 1 ^f GW protection (mg/kg in soil)
	NMED residential SSL (mg/kg)	NMED Indus. SSL (mg/kg)		
Benzene	6	14	0.06	0.003
Toluene	180	180	5	0.2
Ethyl benzene	68	68	8	0.4
Xylene	63	63	100	5
Naphthalene	53	180	0.2	0.01
2-methyl naphthalene	1000 ^c	2500 ^c	--- ^c	--- ^c
Benzo(a)anthracene	6.2	26	40	2
Benzo(b)fluoranthene	6.2	26	20	0.8
Benzo(k)fluoranthene	62	260	200	8
Benzo(a)pyrene	0.62	2.6	100	6
Chrysene	610	2500	1000	50
Dibenz(a,h) anthracene	0.62	2.6	9	0.5
Indeno(1,2,3-c,d) pyrene	6.2	26	40	2

^c no NMED value available, value taken from MADEP paper

^f for contaminated soil in contact with ground water

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1997. Toxicological Profile for Hydraulic fluids.

Massachusetts Department of Environmental Protection, Bureau of Waste Site Cleanup and Office of Research and Standards. 1994. "Background Documentation for the Development of the MCP Numerical Standards."

Massachusetts Department of Environmental Protection, Bureau of Waste Site Cleanup and Office of Research and Standards. 2001. "Characterizing Risks Posed by Petroleum

Final TPH guidelines

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Contaminated Sites: Implementation of the MADEP VPH/EPH Approach Final Draft June 2001.”

New Mexico Environment Department, Hazardous Waste Bureau and Ground Water Quality Bureau Voluntary Remediation Program. 2000. “Technical Background Document for Development of Soil Screening Levels.” Document # NMED-00-008.