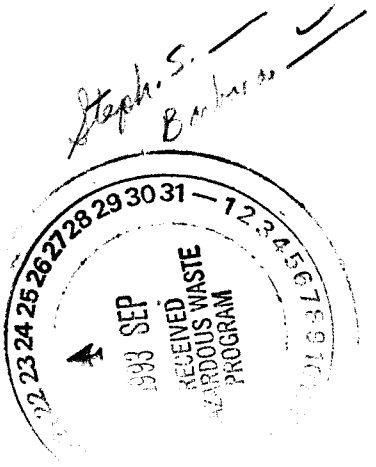
Department of Energy
Field Office, Albuquerque
Los Alamos Area Office
Los Alamos, New Mexico 87544

SEP 17 1993



Barbara Hoditschek
Permit Program Manager
Hazardous and Radioactive Materials Bureau
New Mexico Environment Department
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, NM 87502

Dear Ms. Hoditschek:

The purpose of this letter is to transmit the enclosed report, Response to Concerns Regarding Closure of the TA-35 TSL-125 Surface Impoundment, which addresses technical issues regarding closure activities for the TA-35 TSL-125 surface impoundment at the Los Alamos National Laboratory (Laboratory). The State of New Mexico Environment Department (NMED) expressed technical concerns during a meeting between DOE, the Laboratory, and NMED personnel on July 27, 1993.

The primary concerns discussed were that analytical limits of quantitation (LOQ) from the supplemental sampling of Ten Site Canyon on December 1, 1992, exceed health-based action levels for six semivolatile organic compounds (SVOCs). These six SVOCs of concern are m-benzidine; n-nitrosodimethylamine; n-nitrosodi-n-propylamine; 3,3-dichlorobenzidine; 2,6-dinitrotoluene; and hexachlorobenzene.

The following is a brief summary of the enclosed report. None of the six SVOCs were detected in any of the soil samples associated with the closure of TSL-125. Additionally, the absence of three of the six SVOCs, m-benzidine, n-nitrosodimethylamine, and n-nitrosodi-n-propylamine, were previously determined from knowledge of process (KOP) in the partial closure approved by NMED on September 29, 1992, and are addressed again in the KOP discussion. The remaining three SVOCs are addressed based on discussions of:

1) Interpretation of Estimated Quantitation Limits (EQLs) Versus Sample-Specific LOQs. Sample-specific LOQs were better than or met the EQLs provided by EPA Method 8270 for SVOCs.

2) Sample-Specific LOQs Lower Than Health-Based Action Levels. Analyses indicate that the SVOCs were not detected in any of the 53 soil samples. Furthermore, the LOQs were below the health-based action levels in 26 of 53 samples.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B. Hoditschek, continued.

3) Absence of Downgradient SVOC Contamination. Demonstrated absence of SVOC contamination along the most probable contaminant migration route from the former surface impoundment.

4) Facility Knowledge of Process. Based on KOP, the SVOCs were never used in the operations or processes associated with the site.

Therefore, based on the enclosed report, it is requested that the clean closure equivalency demonstration for the unit be granted and interim status terminated.

Should you have any questions, feel free to contact Paul Treat of my staff at 667-5808.

Sincerely,

Theodore Taylor
Program Manager
Environmental Restoration Program
Los Alamos Area Office
Department of Energy

Enclosure

cc w/enclosure:
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P. Treat, ES&H, LAAO
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Response to NMED Concerns Regarding Closure of the TA-35 TSL-125 Surface Impoundment

Los Alamos National Laboratory
Los Alamos, New Mexico

September 17, 1993

RESPONSE TO NMED CONCERNS REGARDING CLOSURE OF THE TA-35 TSL-125 SURFACE IMPOUNDMENT

This report addresses technical issues regarding closure activities for the TA-35 TSL-125 surface impoundment at the Los Alamos National Laboratory (Laboratory). The State of New Mexico Environment Department (NMED) expressed technical concerns during a meeting between DOE, the Laboratory, and NMED personnel on July 27, 1993. The primary concerns discussed were that analytical limits of quantitation (LOQ) from the supplemental sampling of Ten Site Canyon on December 1, 1992, exceed health-based action levels for six semivolatile organic compounds (SVOCs).

These six SVOCs of concern are m-benzidine; n-nitrosodimethylamine; n-nitrosodi-n-propylamine; 3,3-dichlorobenzidine; 2,6-dinitrotoluene; and hexachlorobenzene. None of these SVOCs were detected in any of the soil samples associated with the closure of TSL-125. Additionally, the absence of three of the six SVOCs, m-benzidine, n-nitrosodimethylamine, and n-nitrosodi-n-propylamine, were previously determined from knowledge of process (KOP) in the partial closure approved by NMED on September 29, 1992, and will be addressed again in the KOP discussion below. The remaining three SVOCs will be addressed based on discussions of:

1) Interpretation of Estimated Quantitation Limits (EQLs) versus Sample-specific LOQs. Sample-specific LOQs were better than or met the EQLs provided by EPA Method 8270 for SVOCs.

2) Sample-specific LOQs Lower Than Health-Based Action Levels. Analyses indicate that the SVOCs were not detected in any of the 53 soil samples. Furthermore, the LOQs were below the health-based action levels in 26 of 53 samples.

3) Absence of Downgradient SVOC Contamination. Demonstrated absence of SVOC contamination along the most probable contaminant migration route from the former surface impoundment.

4) Facility Knowledge of Process. Based on KOP, the SVOCs were never used in the operations or processes associated with the site.

Background

On July 7, 1992, the NMED issued a letter that disapproved the closure plan and closure certification for the TSL-125 surface impoundment and denied clean closure because NMED determined the Laboratory had not established that releases from the unit potentially impacting surrounding soils and surface water were below health-based action levels. The Laboratory then amended the closure plan to include characterization of the area in Ten Site Canyon that potentially received releases from the surface impoundment. In a letter dated September 29, 1992, the NMED approved the amended closure plan and closure certification and reported that the Laboratory had satisfactorily completed partial closure for the impoundment, but still needed to characterize the area of potential releases from the impoundment to demonstrate that clean closure had been accomplished. As part of the approved closure plan implementation, the Ten Site Canyon area was sampled in eight locations selected as the most likely areas to have received releases from the impoundment. The results of the supplemental sampling and closure effort were submitted to NMED in the "Closure Certification Report, Amended April 22, 1993."

The following are the discussions of (1) the interpretation of estimated quantitation limits (EQLs) (EPA Method 8270 for SVOCs) versus sample-specific LOQs, (2) analytical results of samples whose LOQs are lower than the health-based action levels, (3) the demonstrated absence of SVOC contamination along the most probable contaminant migration route from the former surface impoundment, and (4) KOP, related to the three SVOCs 3,3-dichlorobenzidine, 2,6-dinitrotoluene, and hexachlorobenzene.

1. Interpretation of EQLs versus Sample-specific LOQs

The EQL is defined by EPA SW-846, third edition, as the lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. These levels can be affected by a variety of factors associated with a sample, such as type of matrix and soil moisture content. EPA SW-846 lists constituent-specific EQLs for water and soil samples but cautions that they are provided for guidance and may not always be achievable. Table 1 lists EQLs for four of the SVOCs of concern to the NMED (EQLs were not available in EPA SW-846, Method 8270 for m-benzidine or n-nitrosodimethylamine).

The LOQs identified for each supplemental sample analysis are also presented in Table 1. The LOQ is defined as the smallest concentration/amount of analyte that can be reliably reported as found/detected in a material/sample.

The table clearly demonstrates that sample LOQs were better than or met the EQLs for the SVOCs. In addition, the Laboratory's Environmental Chemistry Group, EM-9, used gel permeation chromatography, which attributes why the Laboratory achieved LOQs lower than those obtained by NMED's contract laboratory for sample splits. Gel permeation chromatography was previously proposed by the laboratory in the amended closure plan approved by NMED on September 29, 1992. In addition, gel permeation chromatography is acceptable under EPA SW-846, method 8270.

2. Sample-specific LOQs lower than Health-based Action Levels

Supplemental soil samples collected in December 1992 were analyzed for all SVOCs listed in EPA Method 8270; bis(2-ethylhexyl)phthalate was the only SVOC detected. This constituent was detected at levels below action levels in all cases and therefore will not be discussed here. Health-based action levels were previously determined from proposed Subpart S methods as described in the closure plan approved by NMED on September 29, 1992. The calculated health-based action levels for three of the SVOCs of concern to the NMED are greater than 330 ppb, which is the lowest LOQ obtained in the supplementary sampling. Three of the nine samples have LOQs of 330 ppb. The three SVOCs are 3,3-dichlorobenzidine; 2,6-dinitrotoluene; and hexachlorobenzene, and the action levels are 1,560, 1,030, and 483 ppb, respectively. Samples with LOQs lower than the action levels confirm that the SVOCs were not present at concentrations above the action levels. Figure 1 illustrates the supplemental sampling locations in Ten Site Canyon. Table 2 lists the location and sample numbers for the supplementary sampling, the sample-specific LOQs, and the detected constituents with levels of detection.

Analytical results of the initial sampling show that only benzoic acid and bis(2-ethylhexyl)phthalate were detected, and only bis(2-ethylhexyl)phthalate was detected in the soil

samples. This constituent was detected at levels below action levels in all cases and therefore will not be discussed here. Table 2 shows that 23 of the 44 soil samples have LOQs of 330 ppb. This is less than the action levels for the three constituents listed above. When both sampling events are combined, in 26 of the total 53 soil samples taken the three constituents listed above had LOQs less than the action levels. This confirms that in about half of the samples the three SVOCs are not present in concentrations above the health-based action levels. Figures 2 through 4 illustrate the previous sampling locations.

The LOQs for 19 of the 20 samples collected from corehole sampling at depths of 5 to 55 feet were 330 ppb and nothing was ever detected (see Table 2). This indicates that no contamination attributable to the surface impoundment was detected at depth, and the LOQs for SVOCs of concern are below action levels.

3. Absence of Downgradient SVOC Contamination

The supplemental sample locations were selected by NMED and the Laboratory/DOE as the most likely areas to receive contamination resulting from releases from the surface impoundment. As shown on Figure 1, PF-35-1 is the sample location closest downgradient to the surface impoundment and would be most likely to have the highest concentrations of constituents released from the unit. Based on the topography in the area, PF-35-7 is the sample location furthest downgradient from the unit. Therefore, these two locations bound the area with the highest likelihood of contamination.

Samples analyzed from locations PF-35-1 and -7 have LOQs of 330 ppb (see Table 2) which is less than the calculated health-based action levels for 3,3-dichlorobenzidine, 2,6-dinitrotoluene, and hexachlorobenzene. In addition, these three constituents were not detected at the two sample locations. Although the sample locations between PF-35-1 and -7 had LOQs greater than the action levels for the three SVOCs, there is no route for the constituents to reach these locations without passing PF-35-1. Therefore, it is highly unlikely that SVOCs exist at these locations.

4. Facility Knowledge of Process

A comparison of the KOP and the semivolatile constituents m-benzidine, n-nitrosodimethylamine, and n-nitrosodi-n-propylamine was included in the initial Closure Certification Report approved by the NMED in the letter dated September 29, 1992. This discussion did not include 3,3-dichlorobenzidine, 2,6-dinitrotoluene, and hexachlorobenzene.

In the first Closure Certification Report, the Laboratory/DOE stated that analytical results for three semivolatile constituents had LOQs that were greater than the calculated health-based action levels for those constituents: m-benzidine, n-nitrosodimethylamine, and n-nitrosodi-n-propylamine. Because analytical results could not confirm the absence of these SVOCs below health-based action levels, KOP was used to demonstrate that the constituents were not a part of the processes associated with the surface impoundment. The Laboratory/DOE understands that NMED accepted the KOP rationale for these constituents when it approved partial closure of the surface impoundment on September 29, 1992.

The analytical results of the supplementary sampling effort in Ten Site Canyon identified three additional semivolatile constituents for which the LOQs were greater than the calculated health-based action levels: 3,3-dichlorobenzidine; 2,6-dinitrotoluene; and hexachlorobenzene.

Discharges to the TSL-125 surface impoundment originated in Building 125, which is used for developing and testing electron guns and related laser assemblies/equipment for a laser technology research program at the Laboratory. The laser equipment that was present in Building 125, concurrent with the use of the TSL-125 surface impoundment, included the laser system, associated equipment, and a supporting machine shop, all of which were first employed in late 1979 or early 1980. The entire building was utilized to support the testing of an Antares laser system, which required the use of a dielectric insulating oil, Shell DIALA(R) OIL AX. No other brands of oil were used during this time. Other chemicals used in the building included freon TF solvent; ethyl alcohol; methanol; 2-propanol; cupric sulfate, anhydrous (dilute solution); ammonium chloride (dilute solution); rhodamine dye; and DODCI dye. A review of the MSDSs for these chemicals indicates that none of these chemicals include the SVOCs of concern to NMED.

Information as to whether the SVOCs were used in Building 125 was provided by Jerry Umphres of the Laboratory's CLS Division, who was involved with the operations at TA-35 TSL-125 during the active life of the surface impoundment. Mr. Umphres has first-hand experience in all aspects of the operations at Building 125 since the inception of site activities. According to Mr. Umphres, none of the SVOCs with LOQs exceeding action levels were used in the processes in Building 125.

Summary

In summary, based on the discussions above, the sample analyses of SVOCs with LOQs that exceeded the calculated health-based action levels should not be interpreted as contaminated. The LOQs in most cases met or exceeded the EPA SW-846 constituent specific EQLs. The analyses performed by the Laboratory utilized gel permeation chromatography to obtain the lowest possible LOQs, which were even lower than the LOQs obtained for the split samples analyzed by the NMED contract laboratory. The analytical results of both the initial and supplementary sampling indicate none of the SVOCs were ever detected. Additionally, the results show that 26 of the 53 soil samples analyzed achieved LOQs for 3,3-dichlorobenzidine; 2,6-dinitrotoluene; and hexachlorobenzene that were below respective action levels. The supplementary sampling results, including those for the most likely downgradient location for contamination from surface impoundment releases, showed no detection of these three constituents at LOQs below action levels. Furthermore, the KOP comparison indicates that the SVOCs were not previously used in the processes and operations in Building 125 and supports the absence of these constituents.

Therefore, the following has been demonstrated:

(1) M-benzidine, n-nitrosodimethylamine, and n-nitrosodi-n-propylamine have already been eliminated through the KOP comparison included in the partial closure certification accepted by NMED in their letter of September 29, 1992.

(2) The other three SVOCs — 3,3-dichlorobenzidine, 2,6-dinitrotoluene, and hexachlorobenzene — are not present above health-based action levels based on

(a) they were not detected in any of the 53 soil samples, (b) the LOQs were below action levels in 26 of 53 samples, (c) they were not detected above action levels in the locations most likely to be affected by releases from the unit, and (d) based on KOP, they were never used in the operations or processes associated with the site.

Therefore, it is requested that the clean closure equivalency demonstration for the unit be granted and interim status terminated.

REFERENCES

EPA SW-846, Third Edition, Revision 1, July 1992.

The Merck Index, 11th ed., Merck & Co., Inc., 1989, pgs. 482, 740.

Hawley's Condensed Chemical Dictionary, 12th ed., revised by Richard J. Lewis, Sr., 1993, p. 424.

Closure Certification Report, TA-35 TSL-125 Surface Impoundment for Los Alamos National Laboratory, Benchmark Environmental Corporation, 1991.

Closure Certification Report, Amended April 22, 1993, TA-35 TSL-125 Surface Impoundment for Los Alamos National Laboratory, Benchmark Environmental Corporation, 1993.

Process Knowledge and Chemical Use at TA-35 TSL-125 Supplement to the TA-35 TSL-125 Surface Impoundment Closure, Letter from Rita Carnes and Barbara Graves of Benchmark Environmental Corporation to Larry Maassen of Los Alamos National Laboratory, April 14, 1992.

Table 1 (Page 1 of 4)

LOQs and EQLs for Semivolatiles for Supplemental Samples

Constituent	Sample Location[A]	Sample Number	LOQ[B] (ppb)	EQL[C] (ppb)
3,3-Dichlorobenzidine	PF-35-1	92.33183	330.	1300.
	PF-35-4	92.33187	1300.	1300.
	PF-35-5	92.33188	330.	1300.
	PF-35-6	92.33189	1300.	1300.
	PF-35-7	92.33190	330.	1300.
	PF-35-8	92.33191	1300.	1300.
2,4-Dinitrotoluene and 2,6-Dinitrotoluene mixture	PF-35-1	92.33183	330.	660.
	PF-35-5	92.33188	330.	660.
	PF-35-7	92.33190	330.	660.
Hexachlorobenzene	PF-35-1	92.33183	330.	660.
	PF-35-5	92.33188	330.	660.
	PF-35-7	92.33190	330.	660.
N-Nitrosodi-n-propylamine	PF-35-1	92.33183	330.	660.
	PF-35-5	92.33188	330.	660.
	PF-35-7	92.33190	330.	660.

LOQs and EQLs for Semivolatiles for Soil Samples Directly Below Impoundment Liner

Constituent	Sample Location[A]	Sample Number	LOQ[B] (ppb)	EQL[C] (ppb)
3,3-Dichlorobenzidine	125L-7	89.13346	330.	1300.
	125L-9	89.13348	330.	1300.
	125L-12	89.13351	330.	1300.
2,4-Dinitrotoluene and 2,6-Dinitrotoluene mixture	125L-7	89.13346	330.	660.
	125L-9	89.13348	330.	660.
	125L-12	89.13351	330.	660.
Hexachlorobenzene	125L-7	89.13346	330.	660.
	125L-9	89.13348	330.	660.
	125L-12	89.13351	330.	660.
N-Nitrosodi-n-propylamine	125L-7	89.13346	330.	660.
	125L-9	89.13348	330.	660.
	125L-12	89.13351	330.	660.

Table 1 (Page 2 of 4)

LOQs and EQLs for Semivolatiles for Soil Samples of Ten to Fifteen Foot Depth

Constituent	Sample Location[A]	Sample Number	LOQ[B] (ppb)	EQL[C] (ppb)
3,3-Dichlorobenzidine	125FS-1	89.17609	330.	1300.
2,4-Dinitrotoluene and 2,6-Dinitrotoluene mixture	125FS-1	89.17609	330.	660.
Hexachlorobenzine	125FS-1	89.17609	330.	660.
N-Nitrosodi-n-propylamine	125FS-1	89.17609	330.	660.

LOQs and EQLs for Semivolatiles for Corehole Samples

Constituent	Sample Location[A]	Sample Number	LOQ[B] (ppb)	EQL[C] (ppb)
3,3-Dichlorobenzene	125-1-5'	90.19759	330.	1300.
	125-1-10'	90.19760	330.	1300.
	125-1-15'	90.19761	330.	1300.
	125-1-25'	90.19763	330.	1300.
	125-1-30'	90.19764	330.	1300.
	125-1-35'	90.19765	330.	1300.
	125-1-40'	90.19766	330.	1300.
	125-1-45'	90.19767	330.	1300.
	125-1-50'	90.19768	330.	1300.
	125-2-5'	90.19781	330.	1300.
	125-2-10'	90.19782	330.	1300.
	125-2-15'	90.19783	330.	1300.
	125-2-20'	90.19784	330.	1300.
	125-2-25'	90.19785	330.	1300.
	125-2-30'	90.19786	330.	1300.
	125-2-35'	90.19787	330.	1300.
	125-2-40'	90.19788	330.	1300.
	125-2-50'	90.19790	330.	1300.
	125-2-55'	90.19791	330.	1300.
2,4-Dinitrotoluene	125-1-5'	90.19759	330.	660.
	125-1-10'	90.19760	330.	660.
	125-1-15'	90.19761	330.	660.
	125-1-25'	90.19763	330.	660.
	125-1-30'	90.19764	330.	660.
	125-1-35'	90.19765	330.	660.
	125-1-40'	90.19766	330.	660.

Table 1 (Page 3 of 4)

LOQs and EQLs for Semivolatiles for Corehole Samples
(Continued)

Constituent	Sample Location[A]	Sample Number	LOQ[B] (ppb)	EQL[C] (ppb)
	125-1-45'	90.19767	330.	660.
	125-1-50'	90.19768	330.	660.
	125-2-5'	90.19781	330.	660.
	125-2-10'	90.19782	330.	660.
	125-2-15'	90.19783	330.	660.
	125-2-20'	90.19784	330.	660.
	125-2-25'	90.19785	330.	660.
	125-2-30'	90.19786	330.	660.
	125-2-35'	90.19787	330.	660.
	125-2-40'	90.19788	330.	660.
	125-2-50'	90.19790	330.	660.
	125-2-55'	90.19791	330.	660.
2,6-Dinitrotoluene	125-1-5'	90.19759	330.	660.
	125-1-10'	90.19760	330.	660.
	125-1-15'	90.19761	330.	660.
	125-1-25'	90.19763	330.	660.
	125-1-30'	90.19764	330.	660.
	125-1-35'	90.19765	330.	660.
	125-1-40'	90.19766	330.	660.
	125-1-45'	90.19767	330.	660.
	125-1-50'	90.19768	330.	660.
	125-2-5'	90.19781	330.	660.
	125-2-10'	90.19782	330.	660.
	125-2-15'	90.19783	330.	660.
	125-2-20'	90.19784	330.	660.
	125-2-25'	90.19785	330.	660.
	125-2-35'	90.19787	330.	660.
	125-2-40'	90.19788	330.	660.
	125-2-50'	90.19790	330.	660.
	125-2-55'	90.19791	330.	660.
Hexachlorobenzene	125-1-5'	90.19759	330.	660.
	125-1-10'	90.19760	330.	660.
	125-1-15'	90.19761	330.	660.
	125-1-25'	90.19763	330.	660.
	125-1-30'	90.19764	330.	660.
	125-1-35'	90.19765	330.	660.
	125-1-40'	90.19766	330.	660.
	125-1-45'	90.19767	330.	660.
	125-1-50'	90.19768	330.	660.
	125-2-5'	90.19781	330.	660.
	125-2-10'	90.19782	330.	660.

Table 1 (Page 4 of 4)

LOQs and EQLs for Semivolatiles for Corehole Samples
(Continued)

Constituent	Sample Location[A]	Sample Number	LOQ[B] (ppb)	EQL[C] (ppb)
	125-2-15'	90.19783	330.	660.
	125-2-20'	90.19784	330.	660.
	125-2-25'	90.19785	330.	660.
	125-2-30'	90.19786	330.	660.
	125-2-35'	90.19787	330.	660.
	125-2-40'	90.19788	330.	660.
	125-2-50'	90.19790	330.	660.
	125-2-55'	90.19791	330.	660.
N-nitrosodi-n-propylamine	125-1-5'	90.19759	330.	660.
	125-1-10'	90.19760	330.	660.
	125-1-15'	90.19761	330.	660.
	125-1-25'	90.19763	330.	660.
	125-1-30'	90.19764	330.	660.
	125-1-35'	90.19765	330.	660.
	125-1-40'	90.19766	330.	660.
	125-1-45'	90.19767	330.	660.
	125-1-50'	90.19768	330.	660.
	125-2-5'	90.19781	330.	660.
	125-2-10'	90.19782	330.	660.
	125-2-15'	90.19783	330.	660.
	125-2-20'	90.19784	330.	660.
	125-2-25'	90.19785	330.	660.
	125-2-30'	90.19786	330.	660.
	125-2-35'	90.19787	330.	660.
	125-2-40'	90.19788	330.	660.
	125-2-50'	90.19790	330.	660.
	125-2-55'	90.19791	330.	660.

Notes:

(A) Sample locations are presented on Figures 1-4.
(B) Limit of Quantitation
(C) Estimated Quantitation Limit (from SW-846, Method 8270, Table 2)

Table 2 (Page 1 of 2)

Summary of Semivolatile Sampling Results for TA-35 TSL-125

Supplemental Samples

Location No.[A]	Sample No.	LOQ[B] (ppb)
PF-35-1	**92.33183[C]**	**330.**
PF-35-2	92.33184	2700.
PF-35-2R	92.33185	2600.
PF-35-3	92.33186	2600.
PF-35-4	92.33187	1300.
PF-35-5	**92.33188**	**330.**
PF-35-6	92.33189	1300.
PF-35-7	**92.33190**	**330.**
PF-35-8	92.33191	1300.

bold =

Initial Samples

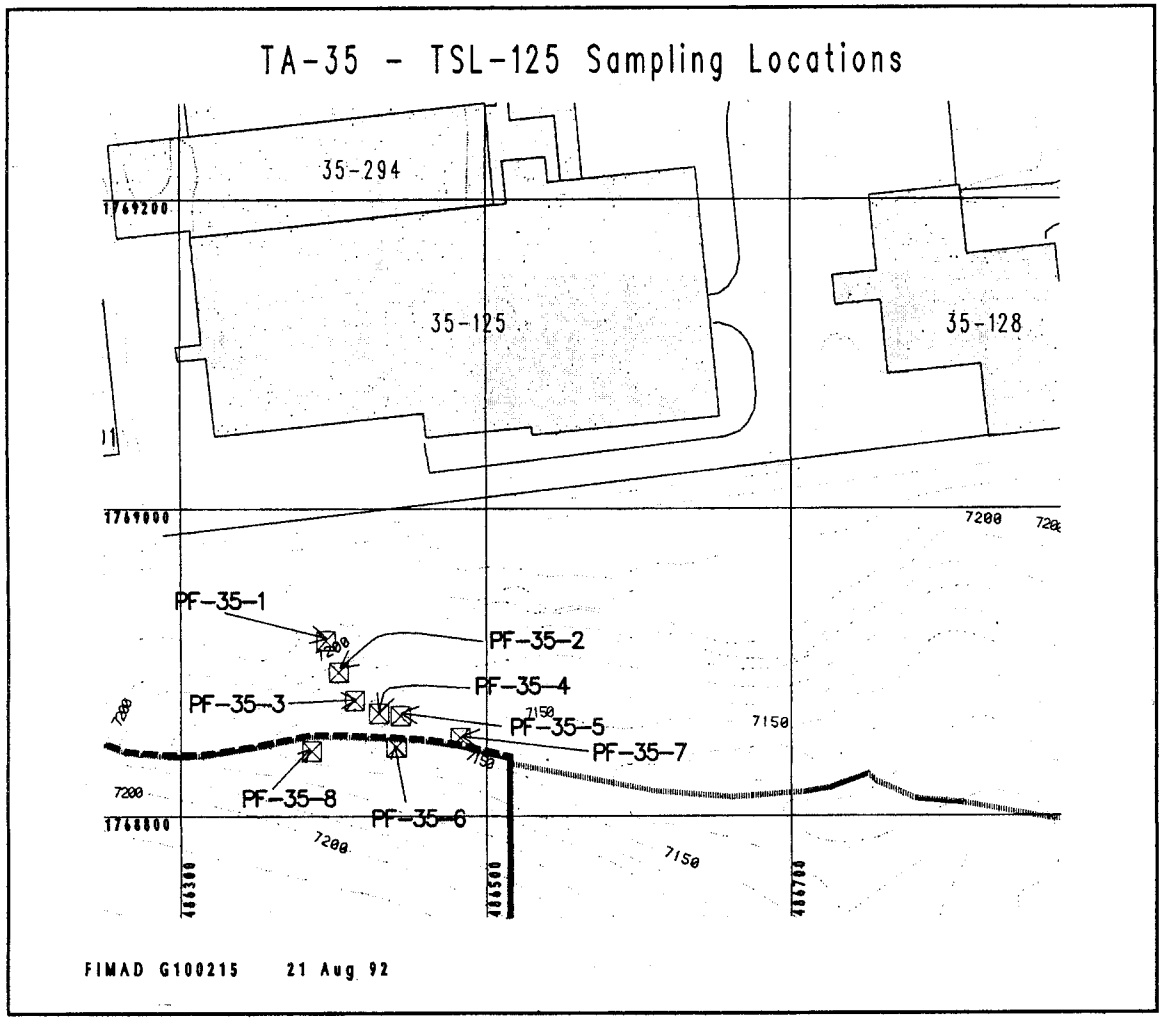
Location No.[A]	Sample No.	LOQ[B] (ppb)
125BH-5[D]	89.17467	10.
125BH-6[D]	89.17468	10.
Decon. Water	89.18188	1100.
125TD-1[D]	89.14190	10.
125TD-2[D]	89.14191	10.
125TD-3[D]	89.14192	10.
125TD-4[D]	89.14193	10.
125L-1	89.13340	13200.
125L-2	89.13341	6600.
125L-3	89.13342	33000.
125L-4	89.13343	33000.
125L-5	89.13344	33000.
125L-6	89.13345	6600.
125L-7	**89.13346**	**330.**
125L-8	89.13347	6600.
125L-9	**89.13348**	**330.**
125L-10	89.13349	6600.

Table 2 (Page 2 of 2)

Initial Samples (Continued)

Location No.[A]	Sample No.	LOQ[B] (ppb)
125L-11	89.13350	6600.
125L-12	**89.13351**	**330.**
125FS-1	**89.17609**	**330.**
125FS-2	89.17610	1716.
125FS-3	89.17611	6600.
125FS-4	89.17612	16995.
125FS-5	89.17613	33000.
125FS-6	89.17614	6699.
125FS-7	89.17615	6699.
125FS-8	89.17616	6699.
125FS-9	89.17617	6699.
125FS-10	89.17618	2706.
125FS-11	89.17619	2706.
125FS-12	89.17620	2706.
125-1-5'	**90.19759**	**330.**
125-1-10'	**90.19760**	**330.**
125-1-15'	**90.19761**	**330.**
125-1-20'	90.19762	265000.
125-1-25'	**90.19763**	**330.**
125-1-30'	**90.19764**	**330.**
125-1-35'	**90.19765**	**330.**
125-1-40'	**90.19766**	**330.**
125-1-45'	**90.19767**	**330.**
125-1-50'	**90.19768**	**330.**
125-2-5'	**90.19781**	**330.**
125-2-10'	**90.19782**	**330.**
125-2-15'	**90.19783**	**330.**
125-2-20'	**90.19784**	**330.**
125-2-25'	**90.19785**	**330.**
125-2-30'	**90.19786**	**330.**
125-2-35'	**90.19787**	**330.**
125-2-40'	**90.19788**	**330.**
125-2-50'	**90.19790**	**330.**
125-2-55'	**90.19791**	**330.**

(A) Sample locations are presented on Figures 1-4.
(B) Limit of Quantitation
(C) Sample numbers in bold face type have LOQs less than action levels for 3,3-dichlorobenzidine, 2,6-dinitrotoluene, and hexachlorobenzene. The action levels for these SVOCs are 1,560 ppb, 1,030 ppb, and 483 ppb, respectively.
(D) Samples are equipment decontamination verification samples.



LEGEND

- Boundary; OU
- Boundary, TA
- Contours, 10 foot
- Fence, Security
- Roads, Paved
- Sampling Location

NORTH, NM State Plane NAD27

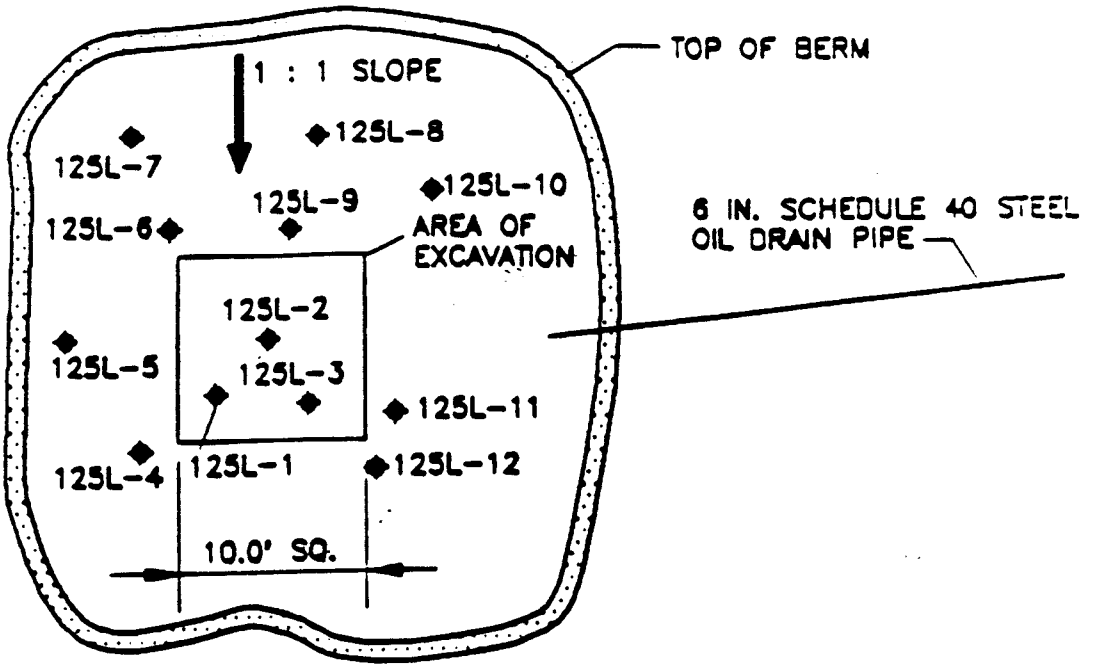
Grid provides NMSP coordinates

Grid interval, in feet: 200

0 125 250 ft

NOTICE: Information on this map is provisional and has not been checked for accuracy.

Figure 1



PLAN VIEW

Figure 2

SOIL SAMPLE LOCATIONS
IMMEDIATELY BELOW GUNITE LINER

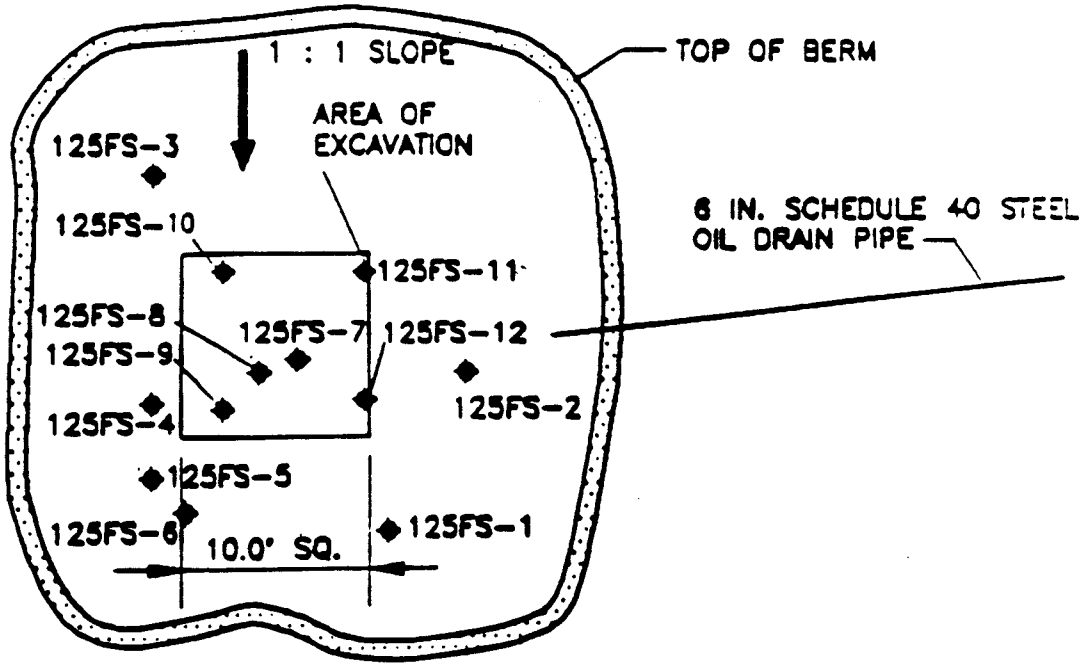
TA-35-TSL-125
SURFACE IMPOUNDMENT

PREPARED FOR

LOS ALAMOS NATIONAL LABORATORY
LOS ALAMOS, NEW MEXICO

10 5 0 10 FEET
APPROXIMATE SCALE

BENCHMARK
ENVIRONMENTAL CORPORATION



PLAN VIEW

Figure 3

SOIL SAMPLE LOCATIONS
FINAL SOIL VERIFICATION SAMPLES

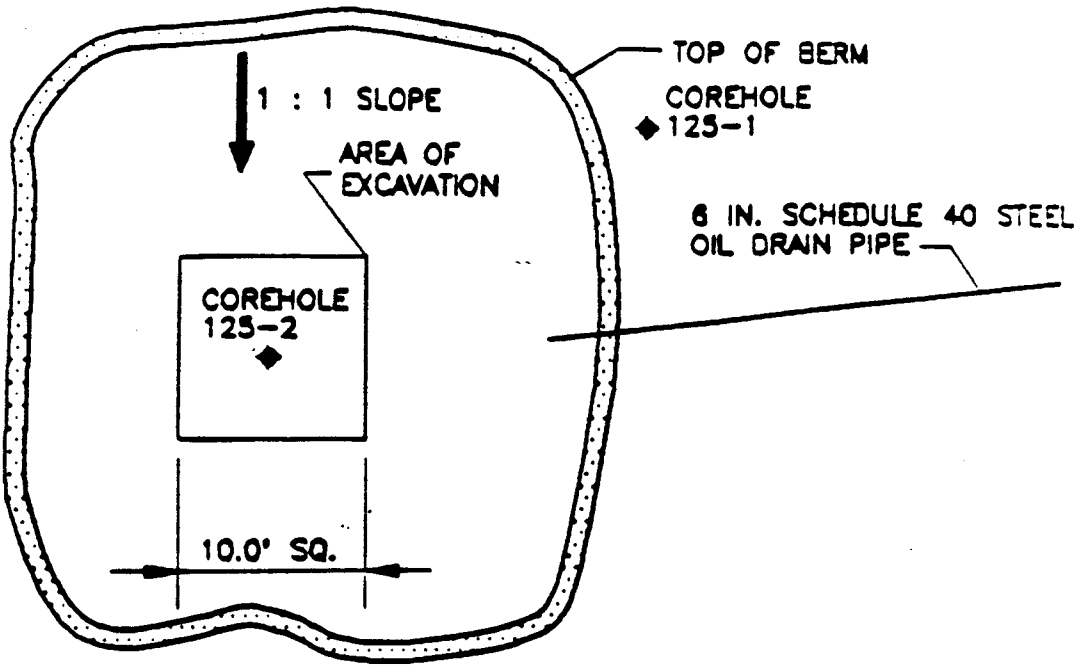
TA-35-TSL-125
SURFACE IMPOUNDMENT

PREPARED FOR

LOS ALAMOS NATIONAL LABORATORY
LOS ALAMOS, NEW MEXICO

10 5 0 10 FEET
APPROXIMATE SCALE

BENCHMARK
ENVIRONMENTAL CORPORATION



PLAN VIEW

DRAWN BY | SBM | CHECKED BY | APPROVED BY | DRAWING NO.

Figure 4

COREHOLE LOCATIONS

TA-35-TSL-125
SURFACE IMPOUNDMENT AND
PROPOSED TEST HOLE LOCATIONS

PREPARED FOR

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LOS ALAMOS, NEW MEXICO

10 5 0 10 FEET
APPROXIMATE SCALE

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