Los Alamos National Laboratory

ENVIRONMENTAL RESTORATION

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Date: February 29, 1996
Refer to: EM/ER:96-086

Ms. Barbara Driscoll
NM Federal Facilities Section
Multimedia Planning and Permitting Division
U.S. Environmental Protection Agency
Region 6, 6PD-N
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

SUBJECT: RESPONSE TO THE NOTICE OF DEFICIENCY (NOD) FOR OPERABLE UNIT (OU) 1079

Dear Barbara:

Enclosed is the Los Alamos National Laboratory's response to the Environmental Protection Agency's (EPA's) NOD concerning potential release sites 32-001, 32-002(a,b), 32-003, and 32-004 of the OU 1079 Resource Conservation and Recovery Act Facility Investigation Report. A certification form signed by the appropriate officials is also enclosed. The NOD was received at the Los Alamos Area Office on November 28, 1995. The enclosed response repeats each comment from the NOD for convenience in reviewing.

Please contact Garry Allen at (505) 667-3394 or Bonnie Koch at (505) 665-7202 if you have any questions about this response to the NOD.

Sincerely,

Jorg Jansen, Program Manager
Environmental Restoration

Sincerely,

for Theodore J. Taylor, Program Manager
Los Alamos Area Office

JJ/TT/bp

CLEANUP LOS ALAMOS...
faster, better, cheaper

2184

Enclosures: Response to NOD for OU 1079
Certification

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GENERAL COMMENTS:

DEFICIENCY 1

Determination of the Extent of Contamination During Phase II Sampling

According to the RCRA Corrective Action Plan (CAP), enough data to determine the extent of contamination should be collected during the RFI (U.S. OSWER EPA 1994). The number and location of proposed samples for Phase II appears to be insufficient to accomplish this requirement. For example, LANL states that for PRSs 32-002(a) and 32-003, "...a minimum of four samples will be collected in each exposure unit (500 m2 for the residential scenario and 2,000 m2 for the recreational scenario). Additional samples may be collected if the variability of contaminants of potential concern (COPC) within the exposure units is greater than currently expected." The objective of a RFI is to determine the nature and extent of contamination associated with a release from a PRS, including contamination in an "exposure unit". Whether the contamination is confined to the "exposure unit" is, however, coincidental.

RESPONSE

The primary objective of the Phase II investigation at Technical Area (TA) 32 is to collect a sufficient number of samples from appropriate locations to define the nature and extent of contamination at each potential release site (PRS). To summarize the approach, the initial sample locations will be based on the most likely sediment accumulation areas adjacent to outfalls, and the locations of the PRSs. Quick-turnaround analytical methods will be used, and a screening assessment will be conducted. If the results indicate that the extent of contamination has not been determined, samples will be collected to bound the extent. The exposure unit approach quoted above is intended to be used as a secondary measure at those sites where a risk assessment needs to be performed [i.e., the septic tank and outfall areas at PRS 32-002(a), and the outfall areas at PRSs 32-002(b) and 32-004].

DEFICIENCY 2

Selection of Number and Locations of Septic System Trench Samples

For Phase II, LANL presents a subjective sampling plan to determine the number and locations of samples in the trenches associated with PRSs 32-002(a) and 32-002(b). The sampling plan

indicates that "these sample locations will be determined judgmentally." Also, the proposed number of samples per trench ranges from one to four. According to Figure 5-3, each of these drain lines is over 100 feet long. Based on this information, EPA does not agree that one to four samples are sufficient to assess the potential contamination of the subsurface soil in these trenches. EPA recommends that the Phase II sampling plan describe a statistically-based or grid-based approach for determining a sufficient sample size and appropriate sample locations for characterizing the contamination in these trenches.

RESPONSE

Los Alamos National Laboratory (LANL) would like to clarify that the trenches planned for the Phase II investigation at PRSs 32-002(a,b) will be excavated along existing drain lines to expose the remaining pipes. LANL intends to visually inspect the pipes for cracks and holes in order to identify locations where potential releases may have occurred. Samples will be collected from soil in areas adjacent to cracks or holes in the pipe, and also in areas adjacent to pipe joints. The number of samples collected will depend on the length of pipe remaining in place, and the sampling interval will not exceed 25 ft (assuming that the pipe segments are greater than or equal to 5 ft in length). Thus, the sampling plan will be biased to visual indications of contamination, with a minimum number of samples collected if no contamination is noted.

DEFICIENCY 3

Field Screening

Field screening of "gross" concentrations of radioactivity and volatile organic vapors as indicator parameters was used to identify sampling locations for target analyte list (TAL) metals and semivolatile organic compounds (SVOC). No evidence was provided indicating that this approach was appropriate. EPA found no evidence correlating "gross" concentrations of radioactivity and volatile organics with concentrations of TAL metals and SVOCs. Conversely, no evidence was provided correlating less-than-gross concentrations of radioactivity and volatile organic vapors with TAL metals and SVOCs.

According to EPA (U.S. EPA OSWER 1989, Page 3-21), indicator parameters are useful for large releases. Based on the historical information at the site, the extent of releases remains largely unknown. In addition, indicator parameters alone are not adequate to demonstrate the

absence of a release because of their relatively high detection limits and because they do not account for all classes of constituents that may be present. Indicator parameters should be used in conjunction with specific constituents. EPA recommends that Phase II include sampling for specific constituents to determine the nature and extent of contamination.

RESPONSE

During the Phase I investigation, field screening of gross concentrations of radioactivity and volatile organic vapors were not used as indicator parameters to identify sampling locations for target analyte list (TAL) metals or semivolatile organic compounds (SVOCs). Rather, as stated in Subsection 1.3 of the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Report for PRSs 32-001, 32-002(a,b), 32-003, and 32-004, if radioactivity were detected in any sample during the field screening, that sample was to be analyzed to identify individual radionuclides. If volatile organic vapors were detected in any sample during field screening, that sample was to be analyzed for volatile organic compounds (VOCs). All soil samples were analyzed for TAL metals and SVOCs regardless of the field screening results, and most of the samples were submitted for analysis of VOCs. Samples were not sent for fixed laboratory analysis of radionuclides, but LANL intends to correct this deficiency during the Phase II investigation. During the Phase II investigation, field screening results will be used in conjunction with fixed laboratory analyses for specific constituents to determine the nature and extent of contamination.

DEFICIENCY 4

Background Data Comparison Methodology

LANL stated that it followed the tolerance interval approach in EPA's "Statistical Analysis of Groundwater Monitoring Data" (U.S. EPA OSW 1989) for determining whether the concentration of a site constituent was statistically different from the background concentration. EPA recommends using a 95 percent coverage, however, the facility used 99 percent coverage. This approach results in a greater upper tolerance limit (UTL) value for background, compared to 95 percent coverage, and increases the likelihood that PRS contaminant concentrations will not be statistically different from background levels—that is, site contaminants will be screened out.

RESPONSE

LANL has agreed to use background upper tolerance limits (UTLs) calculated at the 95th percentile and 95% confidence in all future RFI reports. For this notice of deficiency (NOD) response, LANL has determined the differences resulting from using the new background UTLs in the screening assessments for TA-32. Five inorganic chemicals that were detected at levels below the UTLs used in the RFI report (based on the 99th percentile at 95% confidence) have concentrations greater than their new UTLs. These are barium, calcium, sodium, vanadium, and zinc.

Calcium and sodium have no screening action levels (SALs), but they are essential nutrients for human health. Neither calcium nor sodium are retained as chemicals of potential concern (COPCs) because they were detected at levels that are highly unlikely to have adverse health effects, as described below:

- Calcium was detected at a maximum concentration of 8 500 mg/kg at PRS 32-002(b). The recommended daily allowance for calcium is 800 mg per day for people of ages 1 to 10, and toxic concentrations are much higher (National Research Council 1989, 1251). The average soil intake for people of ages 1 to 10 is 200 mg per day. A person ingesting site soil of the highest calcium concentration at the average intake rate would ingest 1.7 mg of calcium per day, which is well below the recommended daily allowance.

- Sodium was detected at a maximum concentration of 1 100 mg/kg at PRS 32-002(b). The recommended daily allowance for sodium is 46 mg per day for infants, and toxic concentrations are much higher (National Research Council 1989, 1251). The average soil intake for infants is 200 mg per day. An infant ingesting site soil of the highest sodium concentration at the average intake rate would ingest 0.22 mg of sodium per day, which is well below the recommended daily allowance.

The remaining three analytes (barium, vanadium, and zinc) were detected at levels above their new UTLs, but below their SALs. However, the conclusions and recommendations do not change for any of the TA-32 PRSs as discussed below:

- At PRSs 32-002(a) and 32-004, no samples were collected during the Phase I investigation.

- At PRS 32-001, zinc is the only analyte detected at concentrations above the new UTL that was not already retained in the original background comparison. The maximum detected zinc concentration was 60 mg/kg, which is below the SAL of 23 000 mg/kg. When zinc is included in the multiple constituent evaluation (see Subsection 4.1.3.2 of the RFI report), the new total normalized sum is 0.002. Thus, the value is still below 1, indicating that potential adverse human health effects are unlikely. Therefore, zinc is eliminated as a COPC.

- At PRS 32-002(b), barium and vanadium are the only analytes detected at concentrations above the new UTL that were not already retained in the original background comparison. Barium was detected at a maximum concentration of 920 mg/kg, which is below the SAL of 5 300 mg/kg. Vanadium was detected at a maximum concentration of 59 mg/kg, which is below the SAL of 540 mg/kg. When barium and vanadium are included in the multiple constituent evaluation (see Subsection 4.4.3.2 of the RFI report), the new total normalized sum is 1.65. Because barium and vanadium are significant contributors to the total normalized sum, they are retained as COPCs along with cadmium, nickel, silver, and thallium, which were already retained as COPCs in the original multiple constituent evaluation. The only samples with concentrations of barium and vanadium above the new UTLs were samples AAA4705 and AAA4700. Both of these locations are already recommended for further investigation to bound the nature and extent of contamination. Therefore, the conclusions and recommendations for this PRS do not change when the new UTLs are used.

- At PRS 32-003, no analytes were detected at concentrations above the new UTL that were not already retained in the background comparison.

DEFICIENCY 5

Ecotoxicological Screening Assessment Methodology

EPA recommends that LANL revise its ecological screening action level (ESAL) methodology per discussions with EPA in September, 1995.

RESPONSE

LANL concurs. In accordance with conversations between LANL Environmental Restoration (ER) Project personnel and US Environmental Protection Agency (EPA) Region 6 officials, further ecological risk assessment at this site will be deferred until the site can be assessed as a part of the new ecological exposure unit (Ecozone) approach that is being developed by LANL in conjunction with EPA and the New Mexico Environment Department (NMED).

DEFICIENCY 6

Sample Chain of Custody

According to LANL, the only soil sample with a detected level of radiation (gamma) was inadvertently not transferred to a laboratory for isotopic analysis. To ensure that Phase II samples are not inadvertently discarded, EPA recommends that LANL develop, test, and implement improved sample chain of custody procedures—including sample disposal methods—for Phase II.

RESPONSE

During the Phase I investigation at TA-32, gamma radiation was detected in only one soil sample. As stated in the RFI report, this sample was inadvertently not transferred to a laboratory for isotopic analysis. This oversight is attributable to human error. Since the time of the TA-32 investigation, LANL has automated field data collection. Field screening results are now entered directly into a database where the data can be more easily evaluated for elevated field screening results. This should eliminate the type of error that occurred during the Phase I investigation at TA-32.

DEFICIENCY 7

Tables Comparing Screening Action Levels with Sample Values

LANL inadvertently omitted units for the SALs in tables throughout the report (such as Tables 4-1 and 4-2). In subsequent reports, LANL should be certain that all parameters have appropriate units.

RESPONSE

In all of the tables in the RFI Report for PRSs 32-001, 32-002(a,b), 32-003, and 32-004, the units for the SALs are the same as the units listed for the sample values (for example, if the sample value is reported in mg/kg, the SAL is also reported in mg/kg). To avoid any confusion in future reports, LANL will be certain that appropriate units are listed individually for all parameters.

SPECIFIC COMMENTS

DEFICIENCY 1

Section 3.2.1, Background Comparison Methodology, Inorganics, Page 15; and Table 3-2, List of UTLs for LANL Soil Background Data for Inorganic Analytes, Page 16

Following the approach recommended in "Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities" (U.S. EPA OSW 1989), the UTL values discussed on page 15 and presented in Table 3-2 could not be duplicated. EPA calculated UTL values with the EPA methodology for a one-sided 95 percent UCL with a coverage of 95 percent. Also, UTL values were calculated using other methods (Blank 1980; Sachs 1984). UTL values calculated with these methods were similar, but were generally less than the values presented in Table 3-2. For example, in Table 3-2, the UTL for aluminum is 123,000 milligrams per kilograms (mg/kg). Calculated values include the following:

- Aluminum value of 47,721 mg/kg, by using EPA methods with a one-sided 95 percent UCL and a coverage of 95 percent

- Aluminum value of 64,775 mg/kg, calculated by using methods described in Sachs (1984), with a two-sided 95 percent UCL and a coverage of 99 percent (although this procedure used a two-sided test instead of a one-sided test, it is conservative and produces a UTL value suitable for comparison).

- Aluminum value of 22,377 mg/kg, calculated by using methods described in Blank (1980), with a one-sided 95 percent UCL.

If the UTL values in Table 3-2 are wrong, EPA recommends that LANL revise the table and the data comparisons. Also, LANL should present the methodology that was used to calculate the UTLs including UTLs calculated on the 95 percent coverage.

RESPONSE

As stated in Subsection 3.2.1 of the RFI report, complete details on the calculation of the UTLs used in the RFI report are described in the LANL ER Project policy paper on background comparisons (Environmental Restoration Project Assessments Council 1995, 1218). Some of the inorganic chemicals had lognormal statistical distributions, and the data for these chemicals was log-transformed before calculating the UTL. Aluminum was one of these log-transformed chemicals, which explains the difficulty in reproducing the UTL calculation.

As described in General Deficiency 4, LANL has agreed to use UTLs calculated at the 95th percentile and 95% confidence in future RFI reports. The data used and the statistical methodology applied to calculate the revised UTLs are described in "Natural Background Geochemistry and Statistical Analysis of Selected Soil Profiles, Sediments, and Bandelier Tuff" (Longmire et al. 1995, 1266). As shown in the response to General Deficiency 4, there are no changes to the conclusions and recommendations for any of the TA-32 PRSs using the new UTLs.

DEFICIENCY 2

Section 3.2.1, Background Comparison Methodology, PAHs, p 15

EPA has already commented on the inappropriateness of using another study to define the background level of PAHs at LANL.

RESPONSE

The RFI Report for PRSs 32-001, 32-002(a,b), 32-003, and 32-004 was written prior to EPA's guidance regarding the inappropriateness of using another study to define the background levels of polycyclic aromatic hydrocarbons (PAHs) at LANL. The methodology used to address PAHs has been changed in reports prepared subsequent to EPA's guidance.

When background comparisons for PAHs are disregarded and the detected PAH levels are compared to their SALs, the results do not change for any of the TA-32 PRSs. The results for PAHs at each of the TA-32 PRSs are presented in Appendix A of the RFI report and are described below:

- At PRS 32-001, no PAHs were detected.
- At PRSs 32-002(a) and 32-004, no samples were collected.
- At PRS 32-002(b), PAHs were already carried through the SALs comparison, as explained in Subsection 4.4.3.1 of the RFI report.
- At PRS 32-003, all PAHs were detected at concentrations below their SALs. When the noncarcinogenic PAHs are included in the multiple constituent evaluation, the new total normalized sum does not change. When the carcinogenic PAHs are included in the multiple constituent evaluation, the new total normalized sum is still less than one, at 0.69.

DEFICIENCY 3

Table 3-2, List of UTLs for LANL Soil Background Data for Inorganic Analytes, Page 16

For UTL calculations, guidance requires that data be normally or log-normally distributed (U.S. EPA OSW 1989). However, for the calcium data presented in Table 3-2, the coefficient of variation (COV) is 2.16, indicating that the data are non-normally distributed. PRC recommends that LANL explain how the UTL calculation was performed. If the calculation was performed with nontransformed data, it should be revised by using log-transformed data.

RESPONSE

As stated in Subsection 3.2.1 of the RFI report, complete details on the calculation of the UTLs used in the RFI report are described in the LANL ER Project policy paper on background comparisons (Environmental Restoration Project Assessments Council 1995, 1218). Some of the inorganic chemicals had lognormal statistical distributions, and the data for these chemicals was log-transformed before calculating the UTL. Calcium was one of these log-transformed chemicals, which explains the difficulty in reproducing the UTL calculation.

DEFICIENCY 4

4. Section 4.1.1, Description of PRS 32-001, Page 21

LANL indicates that the disposition of incinerator ash is unknown. Potentially, ash could have periodically been disposed on the soil around the incinerator outside the building. In Phase II, LANL should (1) identify and discuss the reasonable scenarios for ash disposal and (2) devise a sampling strategy for characterizing the nature and extent of contamination due to ash disposal.

RESPONSE

The sampling plan for PRS 32-001 is described in Subsection 7.2.1 of the RFI Work Plan for OU 1079, which was approved by the EPA (LANL 1992, 0783). No sampling strategy was proposed in the work plan to address ash disposition.

However, LANL has reviewed the archival information related to the disposition of the incinerator ash at PRS 32-001, and has verified that the ash was not disposed of within the confines of TA-32 (Francis 1995, 06-0127). Rather, ash was removed from the incinerator by the Zia Company and hauled away from the site. Because the ash was removed from TA-32, contamination due to ash disposal is not a factor in the sampling strategy for this site.

DEFICIENCY 5

Section 4.1.2, Field Investigation and Sampling Activities at PRS 32-001, Page 21

LANL indicates that one soil sample was collected from near the base of the former incinerator, and one sample was collected downslope from the initial sampling location. The work plan indicated that a sample would be collected from immediately beneath the foundation of the

former incinerator. Because the liquid wastes would have a high potential to migrate below the foundation of the former incinerator, this would have been the most appropriate location at which to assess the potential of contamination. EPA recommends that LANL (1) explain why these locations were selected and why the soil beneath the former incinerator was not sampled, (2) identify sufficient numbers of appropriate sampling locations, and (3) collect additional samples.

RESPONSE

LANL concurs that there is the possibility of residual contamination below the former incinerator, PRS 32-001. It was LANL's intention to sample at the base of the former incinerator during the Phase I investigation. However, additional archival information surfaced during the development of the Phase II sampling plan, including previously undiscovered engineering drawings and aerial photos that contained conflicting information about the location of the former incinerator.

Recently, the available engineering drawings and aerial photos were used to more accurately determine the correct location of the incinerator. From the available information, the location could only be estimated and surveyed within a 10-ft radius. The results of the survey show that sample AAA4690 was collected from within the surveyed radius, and sample AAA1287 was collected just outside the radius. During the Phase II investigation, another sample will be collected from within the 10-ft radius to confirm the results of the Phase I investigation. This sample will be sent for a full suite of analyses. In addition, as described in Subsection 5.2.2.1 of the RFI report, samples will be collected to define the extent of the polychlorinated biphenyl (PCB) contamination detected during Phase I.

DEFICIENCY 6

Section 4.1.3, Human Health Screening Assessment Results for PRS 32-001, Pages 21-25

The results of LANLs human health screening assessment are invalid because samples were collected from the wrong location. In Phase II, LANL should conduct the screening assessment on data collected from the correct locations.

RESPONSE

Comment is noted. As described in the response to Specific Deficiency 5, additional archival information surfaced during the development of the Phase II sampling plan, suggesting that the samples collected during the Phase I investigation may have been collected from an incorrect location. However, using all of the available engineering drawings and aerial photographs, LANL has surveyed the correct location of the incinerator to within a 10-ft radius. During the Phase II investigation, another sample will be collected from within the 10-ft radius to confirm the results of the Phase I investigation. This sample will be sent for a full suite of analyses. In addition, as described in Subsection 5.2.2.1 of the RFI report, samples will be collected to define the extent of the PCB contamination detected during Phase I.

DEFICIENCY 7

Section 4.1.5, Conclusions and Recommendations for PRS 32-001, Page 26

In the Phase I investigation, LANL did not address the fate of incinerator ash. For Phase II, EPA recommends that LANL reformulate the conceptual site model for PRS 32-001 to include reasonable scenarios describing the fate of the incinerator ash, and characterize the nature and extent of contamination from all releases from PRS 32-001.

RESPONSE

The sampling plan for PRS 32-001 is described in Subsection 7.2.1 of the RFI Work Plan for OU 1079, which was approved by the EPA (LANL 1992, 0783). No sampling strategy was proposed in the work plan to address ash disposition.

However, LANL has reviewed the archival information related to the disposition of the incinerator ash at PRS 32-001, and has verified that the ash was not disposed of within the confines of TA-32 (Francis 1995, 06-0127). Rather, ash was removed from the incinerator by the Zia Company and hauled away from the site. Because the ash was removed from TA-32, contamination due to ash disposal is not a factor in the conceptual exposure model for this site.

DEFICIENCY 8

Section 4.2.1, Description of PRS 32-002(a), Page 26

a. LANL states that it found archival engineering drawings showing the location of the wood septic tank. In the OU 1079 RFI Work Plan, May 1992, LANL explained that it did not know the exact location of the tank and, at best, it could position it into a 30 foot by 40 foot area. The OU 1079 RFI Work Plan for PRS 32-002(a) indicated that one sample was to be collected from each of 15 foot-by-20 foot quadrants. The area of the septic tank is about 10 percent of the area of any of the four quadrants. However, the tank existed in only one of the four quadrants, so, in at least three of the four samples, there was a high probability of detecting no contaminants. EPA contends that this approach favors not finding a contaminant associated with a release from the septic tank unless most of the soil beneath the 30-feet by 40-feet area is contaminated.

Before implementing Phase II, EPA recommends that LANL (1) review all archival information related to PRS 32-002(a), (2) reevaluate the PRS 32-002(a) conceptual site model, including probable contaminant migration pathways, (3) identify data gaps, and (4) reformulate a sampling strategy for characterizing the vertical and horizontal nature and extent of contamination associated with PRS 32-002(a).

b. LANL does not discuss the location of the septic tank collection lines which, according to the OU 1079 RFI Work Plan, were supposed to have been excavated. In Phase II, if the septic lines are found during excavation, EPA recommends that LANL (1) visually inspect pipes for cracks and holes to identify sampling locations for potential releases from the pipes, and (2) collect samples of soil from areas adjacent to cracks or holes.

c. In the OU 1079 RFI Work Plan, LANL indicated that it planned on excavating (to a depth of 5 feet) to find the location of the septic tank collection system by digging perpendicular to the direction of the collection system pipes. Since septic system collection lines are positioned in the shallow subsurface soils, the chance of finding the lines is high. EPA recommends that if the pipes are located, LANL trace them to the septic tank location.

RESPONSE

a. The RFI Work Plan for Operable Unit (OU) 1079 did state that the exact location of PRS 32-002(a), structure TA-32-7, was unknown. However, further archival research was conducted and, as stated in Subsection 4.2.1 of the RFI report, additional archival engineering drawings were found identifying the location of PRS 32-002(a). These drawings, one of which is included as Fig. 1 of this NOD response, show that the septic tank was located on a topographic bench southeast of PRS 32-002(b), structure TA-32-8. During the Phase II investigation, the location of PRS 32-002(a) will be surveyed, and one sample location will be established in each of four quadrants of the septic tank footprint (an approximate 6 ft by 9 ft area). Samples will be collected according to the strategy presented in Subsection 5.2.3.2 of the RFI report.

EPA recommends that LANL 1) review all archival information, 2) reevaluate the conceptual site model, 3) identify data gaps, and 4) reformulate a sampling strategy for characterizing the vertical and horizontal nature and extent of contamination. These recommendations are addressed individually below:

1) All archival information related to PRS 32-002(a) has now been thoroughly reviewed, and the results of this review are described above.

2) The conceptual site model for PRS 32-002(a) has been reevaluated, and no alterations are necessary to the sampling strategy proposed in Subsection 5.2.3.2 of the RFI report.

3) There are no data available at this site. Samples were not collected during the Phase I investigation, nor in any known previous investigations. The data from the Phase II investigation will fill the data gap identified for this site. Quick-turnaround analyses from the Mobile Chemistry Analytical Laboratory (MCAL) will be used to guide the sampling activities.

4) The newly discovered engineering drawings show a more precise location for PRS 32-002(a), allowing for a much smaller sampling area (6 ft by 9 ft). Therefore, one sample will be collected in each of 4.5 ft by 3 ft quadrants in the known septic tank footprint. This sampling strategy will increase the probability of detecting any contaminants associated with the former septic tank.

b. LANL concurs with EPA's recommendation. If the septic lines are located during the Phase II investigation, LANL intends to visually inspect these lines for cracks and holes in order to identify locations where potential releases may have occurred. Samples will be collected from soil in areas adjacent to cracks or holes in the pipe, and also in areas adjacent to pipe joints. The objective will be to define the vertical and horizontal extent of contamination, if any. The number of samples collected will depend on the length of pipe remaining in place, and the sampling interval will not exceed 25 ft (assuming that the pipe segments are greater than or equal to 5 ft in length).

c. LANL concurs with EPA's recommendation. If the pipes are located during the Phase II investigation, LANL will trace them to the septic tank location.

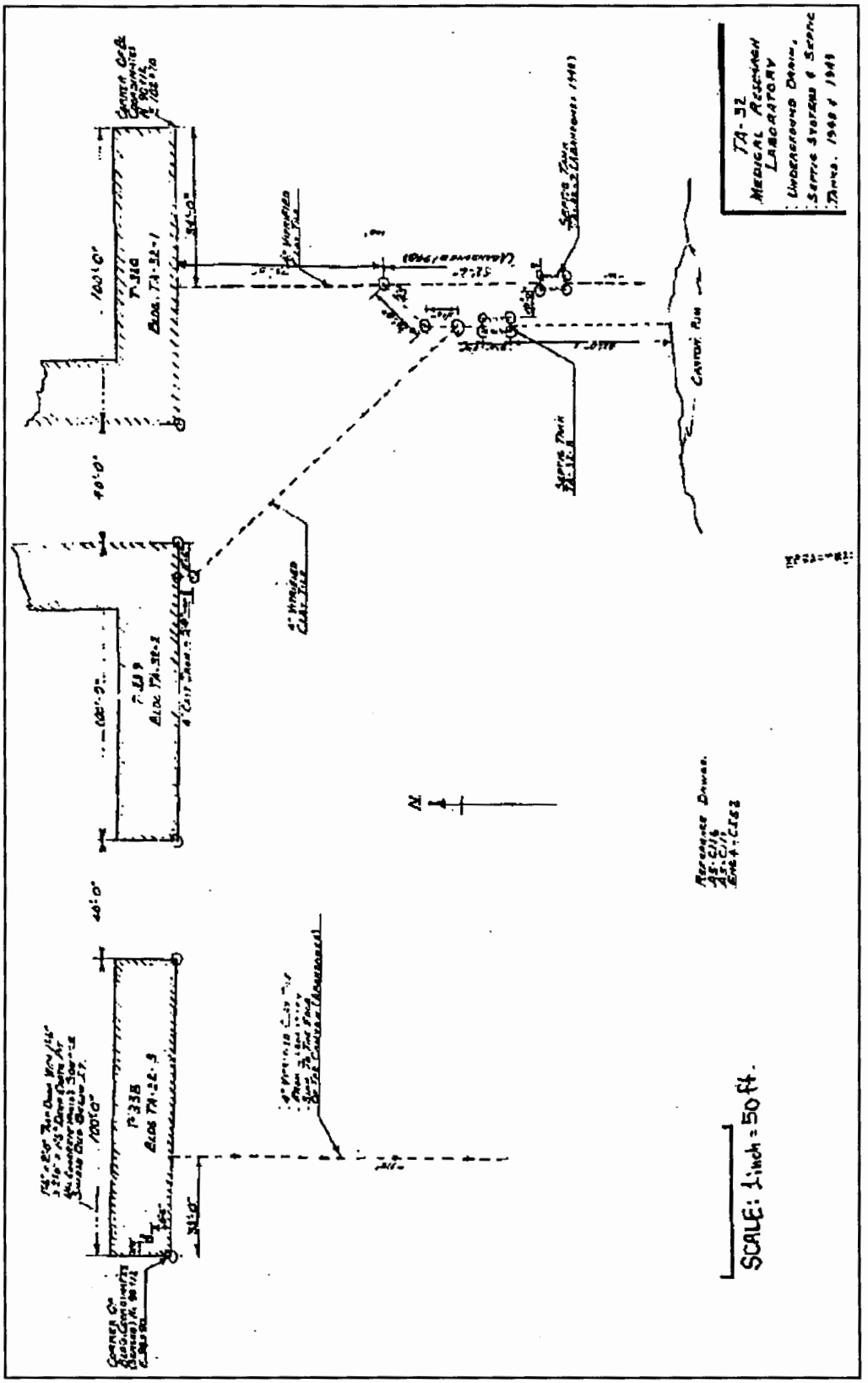

Fig. 1. Engineering drawing showing the correct location of PRS 32-002(a).

DEFICIENCY 9

Section 4.3.2, Field Investigation and Sampling Activities, Page 27

a. LANL indicates that two samples were collected "near" the wood debris pile. Also, "the former transformer location is currently beneath the asphalt parking area of the Los Alamos County Roads Division." Leaks or spills from the transformer would have contaminated the soil beneath the transformer, which is the most appropriate location to collect samples. EPA recommends that LANL explain why soils near the wood debris pile were selected and why the soil beneath the asphalt at the former transformer platform location was not sampled.

b. LANL indicates that several chemicals of potential concern were identified in sediment samples collected from the drainage channel leading from the site to the stream in Los Alamos Canyon. Because ecological receptors may inhabit the stream, EPA recommends that LANL collect sediment/soil samples from several locations in the stream, specifically at the confluence of the drainage channel of the stream and downstream of the confluence.

RESPONSE

a. As described in Subsection 4.3.1 of the RFI report, the location of the wood debris pile was originally believed to be the remains of PRS 32-002(a). However, archival engineering drawings and aerial photographs located after the Phase I investigation indicate that the wood debris pile is more likely the remains of the platform pad for the former transformer station, PRS 32-003 (Figs. 3 and 4). The archival engineering drawings indicate that PRS 32-002(a) is actually located on a topographic bench southeast of the wood debris pile.

While it was stated in the RFI report that the former transformer location is currently beneath the asphalt parking area of the Los Alamos County Roads Division, the new archival evidence shows that this statement is incorrect. Engineering drawing A5-C117 shows the transformer station to contain three barrel transformers on a wooden pad approximately 60 ft from the edge of Los Alamos Canyon (Fig. 2). A 1950 oblique aerial photograph looking northwest towards TA-32 clearly shows power poles near the mesa edge and a three pole transformer (a pad containing three barrel transformers) (Fig. 3). During a field reconnaissance visit on January 9, 1996, the power poles along the mesa edge, which had been cut off at or just above ground level, were located. In addition, the wood debris pile was found to be located within 7 ft of the base of three poles that were cut off and covered by heavy brush. All of this new information confirms that the location of the wood debris pile is the approximate location of PRS 32-003.

Because the Phase I samples were collected at appropriate locations to characterize PRS 32-003 and its outfall, Phase II sampling will focus on defining the extent of the PCB contamination detected during the Phase I investigation.

b. Comment is noted. However, in accordance with conversations between LANL ER Project personnel and EPA Region 6 officials, further ecological risk assessment at this site will be deferred until the site can be assessed as a part of the new ecological exposure unit (Ecozone) approach that is being developed by LANL in conjunction with EPA and NMED.

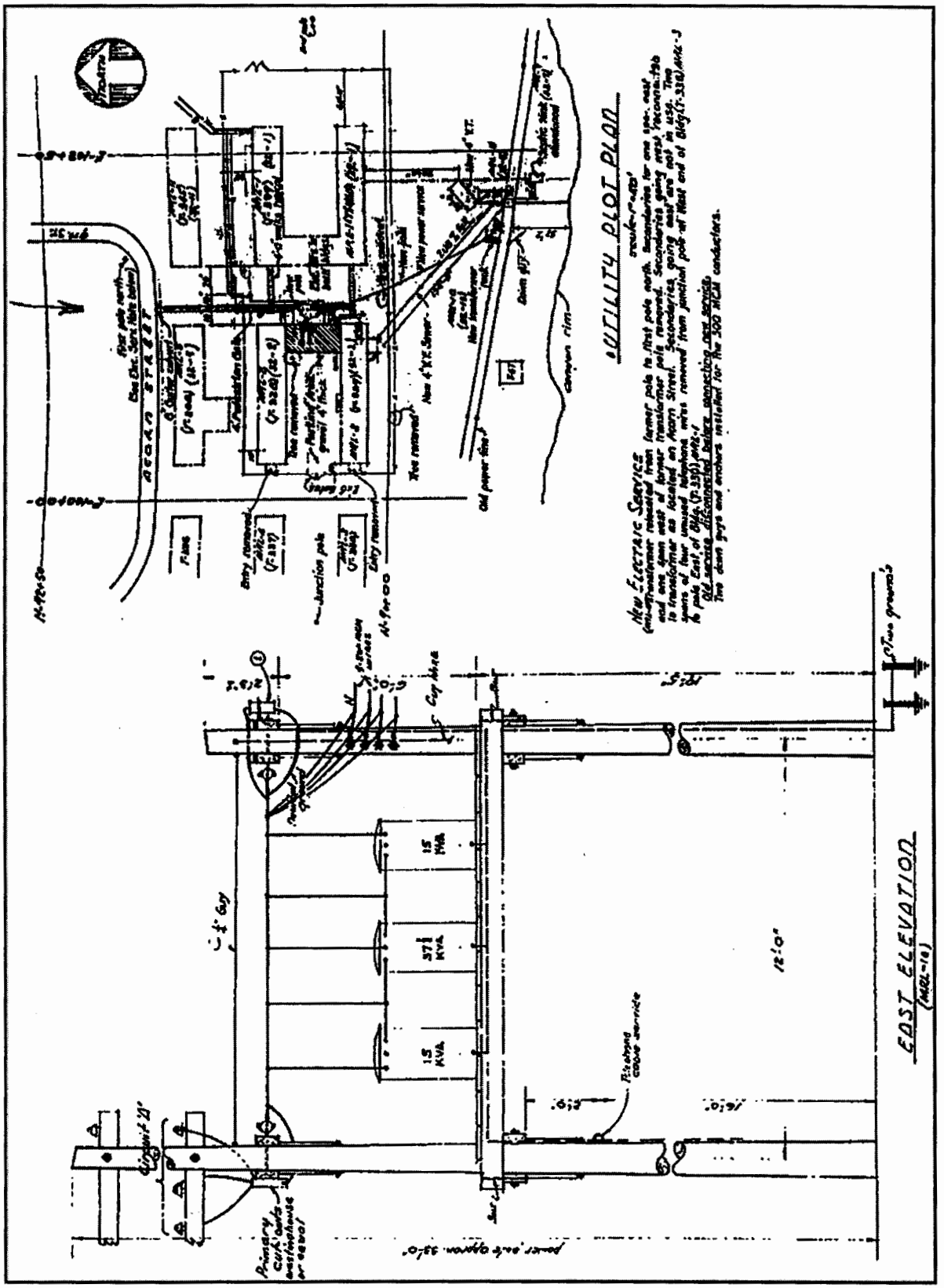

Fig. 2. Engineering drawing showing the correct locations of PRSs 32-003 and 32-002(a).

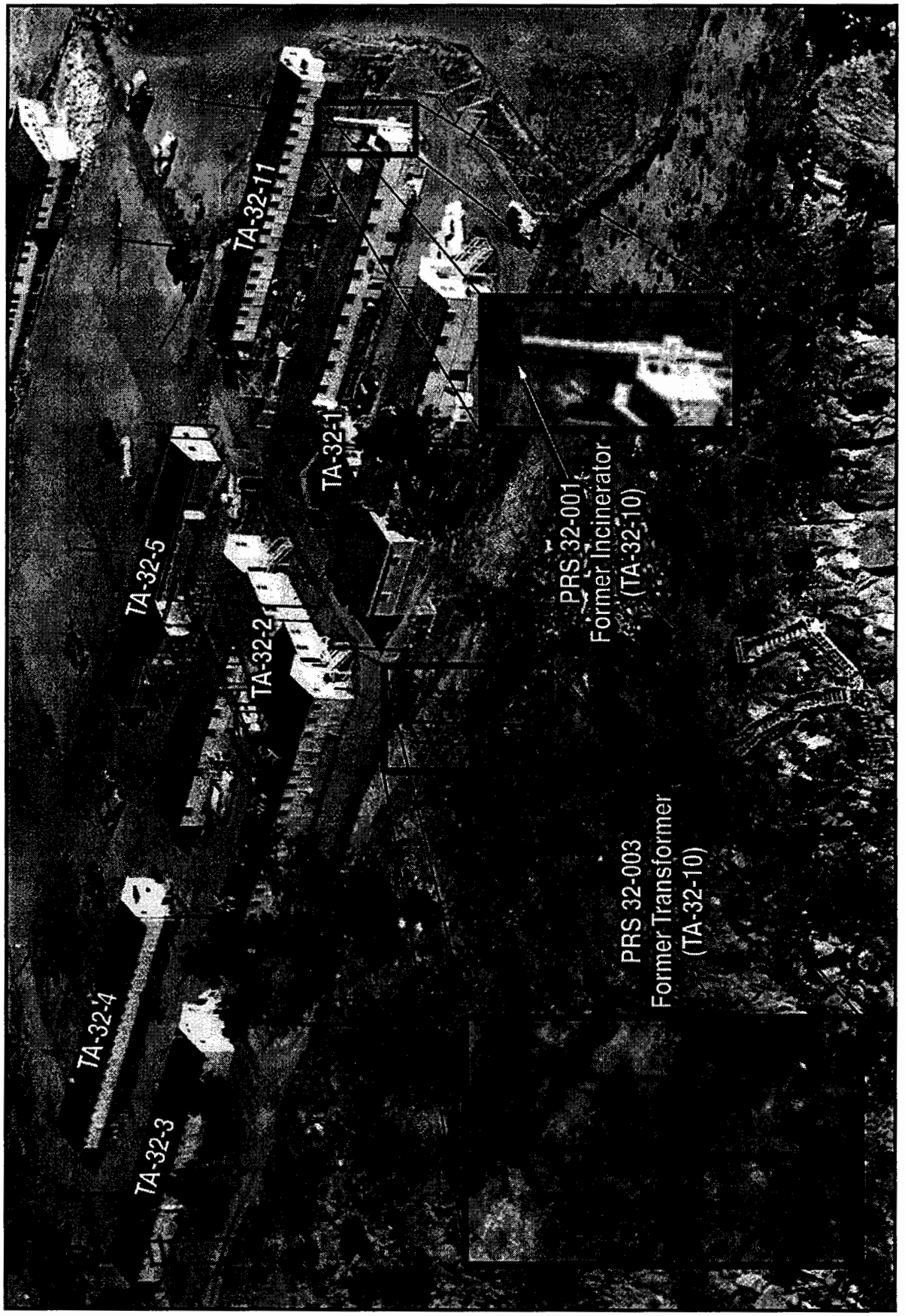

Fig. 3. 1950 oblique aerial photo looking northwest towards TA-32.

DEFICIENCY 10

Section 4.3.4.1, Ecological Screening Action Levels Comparison for PRS 32-003, Page 32

The facility identified lead, zinc, and Aroclor 1260 (PCB) as contaminants of potential ecological concern (COPEC), and stated that these contaminants could be transported to sensitive habitats in Los Alamos Canyon. However, the facility dismissed lead and zinc as COPECs because the concentrations "would be too low to have any impact." One objective of a screening level risk assessment is to identify contaminants of concern to carry through a risk assessment. Sufficient evidence to support this conclusion is not presented in this report. EPA recommends that LANL conduct a qualitative ecological risk assessment with zinc and lead, as well as Aroclor 1260, for ecological receptors inhabiting Los Alamos Canyon. If a ecozone approach is approved for LANL then this information should be carried forward to the ecozone evaluation.

RESPONSE

Comment is noted. However, in accordance with conversations between LANL ER Project personnel and EPA Region 6 officials, further ecological risk assessment at this site will be deferred until the site can be assessed as a part of the new ecological exposure unit (Ecozone) approach that is being developed by LANL in conjunction with EPA and NMED.

DEFICIENCY 11

Section 4.4.2, Field Investigation and Sampling Activities, Septic Tank Location, Page 37

Because additional information was discovered in the archives for PRS 32-002(a), EPA recommends that LANL thoroughly review archives for information on PRS 32-002(b) before implementing Phase II. This effort will help focus Phase II and maximize sampling efforts.

RESPONSE

Comment is noted. After the preparation of the RFI Work Plan for OU 1079, a retired engineer who was previously employed at the facility was identified. Through his private records and knowledge, LANL discovered more complete information about the processes and history of the TA-32 site. LANL has now thoroughly reviewed all relevant archival information related to both PRSs 32-002(a) and 32-002(b).

DEFICIENCY 12

Section 4.4.5, Conclusions and Recommendations for PRS 32-002(b), Page 50

In Phase II, EPA recommends that LANL sample the soils/sediments at the confluence of the drainage channels with the stream in Los Alamos Canyon and the stream sediments because contaminants may have migrated to these habitats which may support ecological receptors.

RESPONSE

As described in the Phase II sampling strategy in Subsection 5.2.3.3 of the RFI report, two samples will be collected in areas of sediment accumulation near the bottom of the canyon to bound the extent of contamination. These samples will be collected at the confluence of the drainage channels with the stream in Los Alamos Canyon.

Although LANL concurs that contaminants may have migrated to habitats in Los Alamos Canyon where ecological receptors may be present, samples will not be collected in the stream channel during this investigation. Rather, in accordance with conversations between LANL ER Project personnel and EPA Region 6 officials, further ecological risk assessment at this site will be deferred until the site can be assessed as a part of the new ecological exposure unit (Ecozone) approach that is being developed by LANL in conjunction with EPA and NMED.

DEFICIENCY 13

13. Section 4.4.5, Conclusions and Recommendations for PRS 32-002(b), Page 51

The facility states that "From an ecological perspective, this proposed sampling should aim towards determining the impact of any potential contamination to the biota. More generally, the proposed sampling should ultimately support a recreational risk assessment for the outfall area."

The meaning of, and the relationship between, these two statements is not clear. In Phase II, EPA recommends that LANL clarify these statements.

RESPONSE

The statement quoted above was intended to propose that the Phase II investigation aim towards defining the risk of any releases at PRS 32-002(b) to both ecological and human receptors. However, in accordance with conversations between LANL ER Project personnel and EPA Region 6 officials, further ecological risk assessment at this site will be deferred until the site can be assessed as a part of the new ecological exposure unit (Ecozone) approach that is being developed by LANL in conjunction with EPA and NMED.

Therefore, the Phase II investigation at PRS 32-002(b) will not address risk to ecological receptors. The objectives of the Phase II investigation at this site will be to 1) characterize the contents of the inflow lines and determine the extent of any releases that may have occurred, and 2) collect a sufficient number of samples from appropriate locations in the outfall area to bound the extent of the contamination detected during Phase I and support a human health risk assessment.

DEFICIENCY 14

Figure 5-2, Conceptual Site Model for TA-32, Page 56

According to LANL, "no apparent releases occur from perched groundwater to an exposure pathway." LANL did not report ground water data to support this claim. Also, LANL has not determined (1) whether perched groundwater underlies TA-32, or (2) the nature and extent of potential contamination associated with a perched aquifer.

RESPONSE

EPA is correct in asserting that LANL has not determined whether perched groundwater underlies TA-32. As stated in Subsection 2.3 of the RFI report, perched groundwater may or may not be present beneath TA-32. The closest site with available groundwater information is TA-21, which is approximately 1.1 miles east of TA-32.

At TA-21, there are two deep boreholes: LADP-3, which was drilled near the base of the slope leading into Los Alamos Canyon, and LADP-4, which was drilled on the mesa top. LADP-3 penetrated two aquifers: 1) a shallow alluvial aquifer in the alluvial canyon fill above the Bandelier Tuff in the bottom of Los Alamos Canyon, and 2) a perched aquifer 325 ft below the bottom of Los Alamos Canyon in the Guaje pumice bed at the base of the Bandelier Tuff (Broxton and Eller 1995, 1162). LADP-4 did not penetrate any aquifers, indicating that the aquifers detected in LADP-3 do not extend beneath the mesa at that location. The lateral continuity of the perched aquifer and the alluvial aquifer beyond TA-21 is not known.

If the alluvial aquifer detected in LADP-3 extends to the portion of Los Alamos Canyon beneath TA-32, it is possible that contaminants in the outfall areas could be released to this aquifer. The existence of contamination in the outfall areas at TA-32 will be determined during the Phase II investigation. If contamination is found in the outfall area, the extent of the contamination will be determined and a risk assessment will be performed, or a corrective action will be conducted.

If a perched aquifer, such as the one found in LADP-3, exists in the Bandelier Tuff beneath TA-32, contaminants could migrate to this aquifer via fractures in the Tuff. However, it is highly unlikely that such an aquifer would be used for domestic water supply (see the response to Specific Deficiency 15). Therefore, it is highly unlikely that any releases occur from perched groundwater to an exposure pathway.

DEFICIENCY 15

Section 5.2.1.1, Potential Human Exposure, Page 57

LANL indicates that "....although contaminants could migrate to perched groundwater via faults or fractures, such perched groundwater does not present a potential human exposure pathway because the main aquifer, at more (sic) 1,000 to 1,200 feet below the site, is the only aquifer used for domestic water supply." Information presented in this report is not sufficient to substantiate this statement. The report should be revised to include information sufficient to substantiate this statement, or the statement should be deleted.

RESPONSE

Subsection 2.5.2.2.3, page 2-30, of LANL's Installation Work Plan for Environmental Restoration, states that the main aquifer of the Los Alamos area is the only aquifer capable of large-scale municipal water supply (LANL 1995, 1275; Purtymun 1984, 0196). As stated in Subsection

3.5.1 of the RFI Work Plan for OU 1079, the potentiometric surface of the main aquifer lies at about 6 000 ft in elevation. At mesa-top sites such as TA-32, over 1 000 ft of unsaturated tuff and other volcanic rock separate the ground surface from the main aquifer (LANL 1992, 0783). As described in Subsection 2.5.2.4.1, page 2-37, of the Installation Work Plan, the characteristics of the Bandelier Tuff provide the main aquifer a substantial degree of protection from contaminant releases at mesa top sites such as TA-32 (LANL 1995, 1275).

It is possible that extensive perched aquifers might be used for independent domestic water supply. However, as discussed in Subsection 2.5.2.2.1, page 2-29, of the Installation Work Plan, available data suggest that most of the perched water systems in the Los Alamos area are of limited extent. For example, testing of the perched water system in mid-Pueblo Canyon depleted the perched groundwater after about an hour's pumping at 2 to 3 gallons per minute (LANL 1995, 1275; Weir et al. 1963, 0395). Also, the data from TA-21 discussed in the response to Specific Deficiency 14 show that a perched aquifer was detected 325 ft below Los Alamos Canyon in LADP-3, but was not detected in LADP-4, located approximately 1 320 ft to the north, which suggests that the extent of this aquifer is limited. Therefore, it is unlikely that any perched aquifers that may exist beneath TA-32 would be extensive enough to be used for domestic water supply.

DEFICIENCY 16

Sections 5.2.1.1.1—5.2.1.1.3, Continued Use by Los Alamos County Roads Division Scenario, Residential Scenario, and Recreational Scenario, Pages 57—60

For Phase II, LANL indicates that drinking water ingestion will not be evaluated as an exposure route. Since LANL plans on conducting a baseline risk assessment, EPA recommends that LANL evaluate all exposure routes.

RESPONSE

As discussed in Subsection 5.2.1.1 of the RFI report, drinking water ingestion is not a potential human exposure scenario at TA-32. Although contaminants could migrate to perched groundwater via faults or fractures, it would not be tapped for drinking water (see the response to Specific Deficiency 15). The main aquifer, which is the only aquifer used for domestic water supply, is separated from the mesa top at TA-32 by more than 1 000 ft of unsaturated tuff sediments. It is highly unlikely that contaminants, especially PCBs and inorganics, could migrate to this depth (see the response to Specific Deficiency 15). Therefore, drinking water ingestion is not a factor in the risk assessments for TA-32.

DEFICIENCY 17

Section 5.2.2, Data Needs and Data Quality Objectives, Pages 61—65

EPA contends that, because the amount of data collected in Phase I is not sufficient to characterize the nature and extent of contamination, no contaminants should be eliminated as COPCs from Phase II. While some of the Phase I data (such as PCB detections at PRSs 32-001 and 32-003) can be used to increase the focus of the investigation, EPA recommends that LANL adequately characterize the nature and extent of contamination at each PRS. EPA recommends that LANL revise its data quality objectives to reflect this objective. EPA also recommends that LANL use EPA guidance (U.S. EPA OSWER 1989) to develop a sampling plan.

RESPONSE

LANL concurs that the data collected in Phase I were not sufficient to characterize the nature and extent of contamination at all of the TA-32 PRSs. During the Phase II investigation, LANL intends to run a full suite of analyses at those sites where the nature of contamination was not fully defined during the Phase I investigation.

DEFICIENCY 18

Section 5.2.2.1, Data Quality Objectives for Phase II Investigation of PRSs 32-001 and 32-003, Page 62

According to the report, "...since PRS 32-001 and PRS 32-003 are both relatively small (approximately 20 feet in diameter), seven sampling locations will detect any spill that is 10 feet in diameter or larger." The report also indicates that the number of samples is based on EPA guidance (U.S. EPA OTS 1985). In Table 4 of "Verification of PCB Spill Cleanup by Sampling and Analysis," EPA recommends collecting 19 samples for sampling areas that range in size from 51 to 400 square feet. The sampling area reported by LANL is about 314 square feet. Consequently, LANL should collect 19 samples at PRS 32-001 and PRS 32-003.

RESPONSE

The sampling approach for PRSs 32-001 and 32-003 was developed using Table 2 of the EPA document "Verification of PCB Spill Cleanup by Sampling and Analysis" to determine an adequate number of sampling locations (EPA 1985, 1242). There are three reasons for initially selecting seven sampling locations. First, the intent of the sampling design is to determine if there has been a PCB release at PRSs 32-001 and 32-003, not to verify cleanup. The PCB spill verification document is used only as general guidance to determine grid spacing. Second, seven samples are proposed as a minimum number with the intention of taking more samples if contamination is detected. Third, as shown in Table 2 of "Verification of PCB Spill Cleanup by Sampling and Analysis," a design of seven locations is guaranteed to detect spills 10 ft in diameter (EPA 1985, 1242), which was judged to be a reasonable spill size for these PRSs.

More importantly, recent archival research and surveying has better located and determined the size of these PRSs. Specifically, PRS 32-001 is roughly 2.5 ft in diameter and has been located to within a 10 ft radius (see Specific Deficiency 5), and PRS 32-003 is roughly 6 ft in diameter and has been precisely located (see Specific Deficiency 9). Process knowledge therefore indicates that potential spills should be located in an area smaller than 10 ft in diameter for each PRS, which better justifies the grid spacing achieved with seven sampling locations. Thus, the seven sampling locations will be better focused on the most likely area where spills may have occurred. Therefore, LANL proposes that seven sampling locations and 14 analyses (two depths at each location) are adequate minimum numbers for these PRSs.

DEFICIENCY 19

Section 5.2.2.2, Data Quality Objectives for Phase II Investigation of Drain Lines at PRSs 32-002(a, b) and 32-004, Page 62

According to LANL, "...the number and locations of samples needed for characterization of the wastes that would be generated during removal of the drain lines are determined on the basis of professional judgement." Number and locations of samples should be determined by statistical procedures rather than subjective means, because little is known about these PRSs. Because there is little historical information on these PRSs, EPA recommends that LANL consult EPA guidance to develop a statistically-based sampling plan for characterizing the nature and extent of contamination of drain lines.

RESPONSE

The phrase quoted in the above deficiency reflects a strategy for characterizing the waste that will be generated if the drain lines and their contents are removed during Phase II; it is not intended to represent a sampling strategy for characterizing the nature and extent of contamination associated with the drain lines.

In order to characterize the nature and extent of any contamination in the drain lines at PRSs 32-002(a,b) and 32-004, LANL intends to visually inspect the pipes for cracks and holes in order to identify locations where potential releases may have occurred. Samples will be collected from soil in areas adjacent to cracks or holes in the pipe, and also in areas adjacent to pipe joints. The number of samples collected will depend on the length of pipe remaining in place, and the sampling interval will not exceed 25 ft (assuming that the pipe segments are greater than or equal to 5 ft in length).

DEFICIENCY 20

Section 5.2.2.2, Data Quality Objectives for Phase II Investigation of Drain Lines at PRSs 32-002(a,b) and 32-004, Page 62

LANL indicates that "...this judgement is based on the length and composition of the drain line, and on the Phase I toxicity characteristic leaching procedures (sic) (TCLP) metals data." LANL did not present any TCLP data in the Phase I RFI report for TA-32. EPA recommends that LANL present adequate data to support statements. EPA also recommends that LANL report all pertinent data that have been collected from TA-32.

RESPONSE

The phrase quoted in the above deficiency reflects a strategy for characterizing the waste that will be generated if the drain lines and their contents are removed during a corrective action; it is not intended to represent a sampling strategy for characterizing the nature and extent of contamination associated with the drain lines.

LANL would like to clarify the proposed waste characterization strategy. As stated in Subsection 5.2.2.2 of the RFI report, because the Phase I toxicity characteristic leaching procedures (TCLP) metals data do not indicate the presence of hazardous constituents, a limited number of samples will be used to verify the Phase I results during Phase II. The TCLP data, which were omitted from the RFI report, are presented in Table 1 of this NOD Response. The number and

locations of samples needed for characterization of the wastes generated during removal of the drain lines will depend primarily on the length of the lines remaining in place. Each major drain line section will be accessed via trenches at a minimum of three locations, and composite soil samples will be collected from the interior of the pipe. These samples will be screened for radioactivity and analyzed for TCLP metals.

TABLE 1

TA-32 PHASE I TCLP[a] METALS DATA

SAMPLE ID	METAL	RESULT (mg/L)	UNCERTAINTY (mg/L)	TCLP LIMIT (mg/L)
AAA1285	Lead	<0.03	–	5
AAA4680	Barium	1.8	0.2	100
AAA4680	Lead	0.04	0.02	5
AAA4694	Lead	<0.03	–	5
AAA4699	Silver	0.05	0.02	5
AAA4699	Cadmium	<0.003	–	1
AAA4699	Lead	<0.03	–	5
AAA4700	Lead	0.9	0.1	5
AAA4702	Lead	<0.03	–	5
AAA4703	Lead	0.07	0.02	5
AAA4704	Lead	0.23	0.06	5
AAA4705	Silver	0.03	0.01	5
AAA4705	Chromium	0.06	0.01	5
AAA4705	Lead	0.87	0.09	5
AAA4706	Lead	<0.03	–	5
AAA4716	Lead	<0.03	–	5
AAA4717	Lead	<0.03	–	5
AAA4719	Lead	<0.03	–	5

[a] TCLP = Toxicity characteristic leaching procedures.

DEFICIENCY 21

Section 5.2.2.2, Data Quality Objectives for Phase II Investigation of Drain Lines at PRSs 32-002(a,b) and 32-004, Page 62

According to LANL, "if no indications of leakage are detected, one sample per trench will be collected below the drain line and analyzed for hazardous constituents." Each of the drain lines is over 100 feet long. One sample per 100 feet of trench is not sufficient to assess the potential contamination of the subsurface soil. EPA recommends that LANL develop a statistical-based or grid-based sampling plan for characterizing the nature and extent of contamination associated with the drain lines.

RESPONSE

LANL would like to clarify that the trenches planned for the Phase II investigation at PRSs 32-002(a,b) will be excavated along existing drain lines to expose the remaining pipes. LANL intends to visually inspect these pipes for cracks and holes in order to identify locations where potential releases may have occurred. Samples will be collected from soil in areas adjacent to cracks or holes in the pipes, and also in areas adjacent to pipe joints. The objective will be to define the vertical and horizontal extent of contamination, if any. The number of samples collected will depend on the length of pipe remaining in place, and the sampling interval will not exceed 25 ft (assuming that the pipe segments are greater than or equal to 5 ft in length). Thus, the sampling plan will be biased to visual indications of contamination, with a minimum number of samples collected if no contamination is noted.

DEFICIENCY 22

Section 5.2.2.3, Data Quality Objectives for Phase II Investigation of Septic Tank and Outfall Areas at PRSs 32-002(a) and 32-003, Page 63

LANL indicates that "...a minimum of four samples will be collected in each exposure unit (500 m2 for the residential scenario and 2,000 m2 for the recreational scenario). Additional samples may be collected if the variability of COPCs within the exposure units is greater than currently expected." According to the RCRA CAP, data sufficient to determine the extent of contamination should be collected during the RFI (U.S. EPA OSWER 1994). EPA contends that the extent of contamination associated with these PRSs cannot be determined by limiting the sampling area to "exposure units." EPA recommends that LANL follow EPA RFI guidance in developing a statistically-based or grid-based plan for sampling these PRSs.

RESPONSE

As discussed in the response to General Deficiency 1, the primary objective of the Phase II investigation at TA-32 is to collect a sufficient number of samples from appropriate locations to define the nature and extent of contamination at each PRS. Extent will be determined relative to SALs but will be influenced by the pattern of contamination detected. For example, most of the proposed sampling will occur in the sediment drainage channel downgradient of the PRSs. There must be an adequate number of samples to document a decreasing trend along these channels and show that contamination is limited to these channels. Because a risk assessment is anticipated to be needed, LANL is also requiring that a minimum of four samples be collected in each exposure unit evaluated in the risk assessment.

The exposure unit approach quoted in the above deficiency is a statistically based approach. The basis for any statistical sampling approach is the variability of the contaminants within sampling subunits. In this case, the primary sampling subunits are the exposure units where risk will be calculated. LANL did not intend to suggest that samples would be collected within a single exposure unit; rather, the number of exposure units to sample will be based on the extent of the release (as discussed above). LANL intends to use field laboratory methods to help bound the release (which will determine the number of exposure units to sample) and to determine the variability of contaminants within exposure units (which will determine the density of samples to be collected in each exposure unit).

DEFICIENCY 23

Section 5.2.2.4, Data Quality Objectives for Phase II Investigation of the Outfall Area at PRS 32-002(b), Page 64

See Deficiency #22.

RESPONSE

As discussed in LANL's response to General Deficiency 1, the primary objective of the Phase II investigation at TA-32 is to collect a sufficient number of samples from appropriate locations to define the nature and extent of contamination at each PRS. Extent will be determined relative to SALs but will be influenced by the pattern of contamination detected. For example, most of the proposed sampling will occur in the sediment drainage channel downgradient of the PRSs. There must be an adequate number of samples to document a decreasing trend along these

channels and show that contamination is limited to these channels. Because a risk assessment is anticipated to be needed, LANL is also requiring that a minimum of four samples be collected in each exposure unit evaluated in the risk assessment.

The exposure unit approach quoted in the above deficiency is a statistically based approach. The basis for any statistical sampling approach is the variability of the contaminants within sampling subunits. In this case, the primary sampling subunits are the exposure units where risk will be calculated. LANL did not intend to suggest that samples would be collected within a single exposure unit. Rather, the number of exposure units to sample will be based on the extent of the release (as discussed above). LANL intends to use field laboratory methods to help bound the release (which will determine the number of exposure units to sample) and to determine the variability of contaminants within exposure units (which will determine the density of samples to be collected in each exposure unit).

DEFICIENCY 24

Section 5.2.2.5, Analytical Strategy for the Phase II Investigation, pages 64—65

The facility states that Level III analytical procedures will be used for confirmation samples. However, the facility has not stated what analytical level will be used to characterize the baseline nature and extent of contamination. EPA recommends that LANL indicate the level of quality of the Phase II characterization data. EPA recommends that, at a minimum, Level II data be collected in Phase II.

RESPONSE

During the Phase II investigation, Level I and II analytical procedures (i.e., field screening and mobile analytical laboratories) will be used to characterize gross levels of contamination. Level III analytical procedures will be used to verify the nature and extent of contamination.

DEFICIENCY 25

Section 5.2.3, Sampling Plan, Pages 65—76

In Section 5.2.2 (pg 61), LANL indicates that much of the Phase II data will be used to support risk assessments. In devising its sampling plan, the selection of sampling locations is critically important for developing a sound basis for a risk assessment (EPA 1990, pg. 27). For Phase II, EPA recommends that LANL collect an adequate number of samples from proper locations sufficient to support a baseline risk assessment.

RESPONSE

LANL recognizes that the selection of sampling locations is critically important for developing a sound basis for a risk assessment. In Subsection 5.2.2 of the RFI report, it is stated that the data from the investigations of 1) the septic tanks and outfalls associated with PRSs 32-002(a) and 32-003, and 2) the outfall associated with PRS 32-002(b) will be used to support risk assessments. The data quality objectives for these investigations are described in Subsections 5.2.2.3 and 5.2.2.4 of the RFI report.

It was LANL's intent to primarily take the pattern of contamination into account when selecting sampling locations. The working contaminant transport model for these PRSs is strongly based on sediment transport in the drainage channels downgradient of the PRSs. Thus, the expected pattern of contamination is quite patchy with elevated concentrations expected in drainages and sediment traps. LANL's intent was to gather information to either confirm this mechanism of contaminant transport or provide information for a revised contaminant transport model. Quick-turnaround analyses from the MCAL will be used to guide sampling activities.

In addition, sampling must also support the requirements of the risk assessment. The risk assessment will assume uniform utilization within each exposure unit and, therefore, exposure, to the entire hillside. Clearly, sample locations that are biased to the most elevated concentrations are not representative of the risk. Thus, the data in the contaminated zone must be weighted by the fraction of the exposure unit area impacted by the contamination. Conceptually this means that either the contaminated zone is clearly delimited by sampling, or that samples must be collected in areas between the drainage pathways to provide information that is more representative of the entire exposure unit. This is specifically how LANL intends to use the pattern of contamination to determine if an adequate number of samples has been collected for each exposure unit.

DEFICIENCY 26

Section 5.2.3.1, PRS 32-001: Former Incinerator Location, Page 65

See Deficiency #18.

RESPONSE

The sampling approach for PRSs 32-001 and 32-003 was developed using Table 2 of the EPA document "Verification of PCB Spill Cleanup by Sampling and Analysis" to determine an adequate number of sampling locations (EPA 1985, 1242). There are three reasons for initially selecting seven sampling locations. First, the intent of the sampling design is to determine if there has been a PCB release at PRSs 32-001 and 32-003, not to verify cleanup. The PCB spill verification document is used only as general guidance to determine grid spacing. Second, seven samples are proposed as a minimum number with the intention of taking more samples if contamination is detected. Third, as shown in Table 2 of "Verification of PCB Spill Cleanup by Sampling and Analysis," a design of seven locations is guaranteed to detect spills 10 ft in diameter (EPA 1985, 1242), which LANL judged to be a reasonable spill size for these PRSs.

More importantly, recent archival research and surveying has better located and determined the size of these PRSs. Specifically, PRS 32-001 is roughly 2.5 ft in diameter and has been located to within a 10 ft radius (see Specific Deficiency 5), and PRS 32-003 is roughly 6 ft in diameter and has been precisely located (see Specific Deficiency 9). Process knowledge therefore indicates that potential spills should be located in an area smaller than 10 ft in diameter for each PRS, which better justifies the grid spacing achieved with seven sampling locations. Thus, the seven sampling locations will be better focused on the most likely area where spills may have occurred. Therefore, LANL proposes that seven sampling locations and 14 analyses (two depths at each location) are adequate minimum numbers for these PRSs.

DEFICIENCY 27

Section 5.2.3.2, PRS 32-002(a): Septic Tank 32-7, Page 66

LANL indicates that "...samples will be collected at each location from the soil/tuff interface, which is expected to be less than 2 feet below ground surface (bgs)." On page 26, the RFI report indicates that the base of the septic tank was at least 4 feet bgs. EPA recommends that LANL collect additional soil samples from the soils below the base of the former septic tank to assess the potential of release and to determine the extent of any release.

RESPONSE

The RFI report states in Subsection 4.2.1 that PRS 32-002(a) was a septic tank that was 4 ft wide, 8 ft long, and 4 ft deep. LANL would like to clarify that this septic tank was aboveground. The 4-ft depth stated in the RFI report was the depth of the tank itself, not the depth of the base

of the septic tank below ground surface. As stated in the RFI report in Subsection 5.2.3.2, Phase II samples will be collected from soils in the footprint of PRS 32-002(a) at the soil/tuff interface, which is below the level at which the base of the former septic tank once rested.

DEFICIENCY 28

Section 5.2.3.2, PRS 32-002(a): Inflow Pipe, Page 68

LANL indicates that "...these sample locations will be determined judgmentally (Fig. 5-3)." According to Figure 5-3, the drain line is over 100 feet long and only two samples will be collected. Two samples are not sufficient to assess the potential contamination of the subsurface soil in this trench. EPA recommends that LANL develop a statistically-based plan for sampling soils around the piping.

RESPONSE

LANL would like to clarify that the trenches planned for the Phase II investigation at PRS 32-002(a) will be excavated along existing drain lines to expose the remaining pipes. LANL intends to visually inspect these pipes for cracks and holes in order to identify locations where potential releases may have occurred. Samples will be collected from soil in areas adjacent to cracks or holes in the pipe, and also in areas adjacent to pipe joints. The number of samples collected will depend on the length of pipe remaining in place, and the sampling interval will not exceed 25 ft (assuming that the pipe segments are greater than or equal to 5 ft in length). Thus, the sampling plan will be biased to visual indications of contamination, with a minimum number of samples collected if no contamination is noted.

DEFICIENCY 29

Section 5.2.3.3, PRS 32-002(b): Inflow Pipe(s), Page 70

See Deficiency #28.

RESPONSE

LANL would like to clarify that the trenches planned for the Phase II investigation at PRS 32-002(b) will be excavated along existing drain lines to expose the remaining pipes. LANL intends to visually inspect these pipes for cracks and holes in order to identify locations

where potential releases may have occurred. Samples will be collected from soil in areas adjacent to cracks or holes in the pipe, and also in areas adjacent to pipe joints. The number of samples collected will depend on the length of pipe remaining in place, and the sampling interval will not exceed 25 ft (assuming that the pipe segments are greater than or equal to 5 ft in length). Thus, the sampling plan will be biased to visual indications of contamination, with a minimum number of samples collected if no contamination is noted.

DEFICIENCY 30

Section 5.2.3.4, PRS 32-003: Former Transformer Location, Page 71

See Deficiency #18.

RESPONSE

The sampling approach for PRSs 32-001 and 32-003 was developed using Table 2 of the EPA document "Verification of PCB Spill Cleanup by Sampling and Analysis" to determine an adequate number of sampling locations (EPA 1985, 1242). There are three reasons for initially selecting seven sampling locations. First, the intent of the sampling design is to determine if there has been a PCB release at PRSs 32-001 and 32-003, not to verify cleanup. The PCB spill verification document is used only as general guidance to determine grid spacing. Second, seven samples are proposed as a minimum number with the intention of taking more samples if contamination is detected. Third, as shown in Table 2 of "Verification of PCB Spill Cleanup by Sampling and Analysis," a design of seven locations is guaranteed to detect spills 10 ft in diameter, which was judged to be a reasonable spill size for these PRSs (EPA 1985, 1242).

More importantly, recent archival research and surveying has better located and determined the size of these PRSs. Specifically, PRS 32-001 is roughly 2.5 ft in diameter and has been located to within a 10 ft radius (see Specific Deficiency 5), and PRS 32-003 is roughly 6 ft in diameter and has been precisely located (see Specific Deficiency 9). Process knowledge therefore indicates that potential spills should be located in an area smaller than 10 ft in diameter for each PRS, which better justifies the grid spacing achieved with seven sampling locations. Thus, the seven sampling locations will be better focused on the most likely area where spills may have occurred. Therefore, LANL proposes that seven sampling locations and 14 analyses (two depths at each location) are adequate minimum numbers for these PRSs.

DEFICIENCY 31

Appendix A, Table A-11, Summary of Non-Detected Analytes at TA-32, Page 1

The report indicates that the detection limit was greater than the SAL for m-benzidine; bis(2-chloroethyl)ether; dibenzo(a,h)anthracene; and n-nitrosodi-n-propylamine. EPA recommends that LANL explain how these contaminants were evaluated as COPCs.

RESPONSE

As stated above, m-benzidine, bis(2-chloroethyl)ether, dibenzo(a,h)anthracene, and n-nitroso-di-n-propylamine were not detected at TA-32, and the detection limit was greater than the SAL. EPA approved testing methods (specifically, SW-846 method 8270) were used for analysis of these chemicals, and none of the detection levels were artificially raised. Therefore, the detection levels were used as surrogate action levels for these analytes, and m-benzidine, bis(2-chloroethyl)ether, dibenzo(a,h)anthracene, and n-nitroso-di-n-propylamine are eliminated as COPCs at TA-32.

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