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

AUG 17 1994

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William K. Honker, Chief
RCRA Permits Branch
U. S. Environmental Protection Agency
Region 6
1445 Ross Ave., Suite 1200
Dallas, Texas 75202-2733

RE: Response to Notice of Deficiency (NOD) for OU 1082 RCRA Facility Investigation (RFI) Work Plan

Dear Mr. Honker:

Enclosed is the response to the NOD for the OU 1082 RFI Work Plan which was submitted to your office for review on July 16, 1993. Environmental Protection Agency (EPA) NOD comments were received at the Los Alamos Area Office on July 18, 1994.

A teleconference call to your staff was initiated on August 8, 1994. We have formulated many of our responses in accordance with the guidance we were given during this discussion, and we have referenced this dialogue, where applicable, within our responses. However, during this discussion, several items were identified as EPA concerns that would be more appropriately addressed at the programmatic level rather than specifically within this NOD response. These items have been identified in the enclosure and we are currently in the process of developing responses which will be delivered to EPA at a later date.

We are also required to deliver, within 60 days of the receipt of your NOD, sampling plans for the sumps sited in deficiency number 18. This material will be sent to you no later than September 16, 1994. You also requested that additional sampling plans and other material addressing deficiencies number 71 and 77 be provided within 90 days of receipt of the NOD. This material will be sent to you no later than October 16, 1994. Additionally, the sampling results for NPDES outfall number EPA05A056 will be sent to you as soon as they are received from the analytical laboratory. Pending your approval of all these deliverables, the revised work plan incorporating all changes outlined in our responses will be submitted to EPA by December 1, 1994.

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Should you have any questions or concerns, please call me at (505) 665-7203, or Bonnie Koch, Scientech, at (505) 665-7202.

Sincerely,

for Theodore J. Taylor
Program Manager
Environmental Restoration
Program

LAAMEP:2TT-009

Enclosure

cc w/enclosure:
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CERTIFICATION

I certify under penalty of law that these documents and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violation.

Document Title:

Response to NOD for RFI Work Plan for OU 1082

Name: _____ Date: 8/15/94

Dennis Erickson
Division Director
Los Alamos National Laboratory

Name: _____ Date: 8/16/94

Joseph Vozella, Chief
Environment, Safety, and Health Branch
DOE-Los Alamos Area Office

OU 1082 NOD RESPONSE

BOLD text is the EPA NOD comments.

General comments:

1. **The baseline risk assessment should use a residential scenario with a 10^{-6} risk until agreement is reached with stakeholders as to future land use scenarios.**
LANL concurs. LANL realizes that it is required to have stakeholder input in order to apply land use scenarios other than the residential scenario with a 10^{-6} risk in the baseline risk assessment. The OU 1082 work plan will be revised to reflect this point.

2. **LANL should note that identification of potential contaminants of concern below screening action levels does not automatically lead to a determination of no further action. The extent of any release must be identified, and if this does not occur in Phase I sampling then it should in Phase II.**
Per our conversation of August 8, 1994, this comment is being addressed on a project-wide basis.

3. **The format used for the HE sumps is very poor. The sampling plans or figures should be included with the description of each sump. In addition, text skips back and forth between different figures and sump numbers which adds confusion in reading the text. For example, all the SWMUs associated with Figure 5-4 should be discussed together rather than split up.**
LANL will reorganize the HE sump subsection to improve the presentation of the sampling plans and figures. In particular, based on our conversation of August 8, 1994, LANL will provide additional copies of location or sampling figures to improve document readability.

4. **More emphasis should be placed on the actual sampling plans rather than on the data quality objectives. The sampling plans are the most important part of the work plan, and yet there is little detail in the work plan related to this. All work plans should be third party executable.**
LANL concurs. LANL is currently developing a field implementation plan for OU 1082 RFI Phase I sampling and analysis. This field implementation plan is scheduled to be complete before the readiness review for late spring field activities. As we discussed in the August 8, 1994 conference call, we will not submit this implementation plan. LANL will submit the revised work plan by December 1, 1994 per our discussion of August 8, 1994.

5. **Engineering surveys for locating sampling points should have been conducted prior to writing the work plan. Actual sampling points should be included in the work plan.**
Per our conversation of August 8, 1994, LANL did conduct extensive field surveys before writing the work plan. These field surveys were essential in developing sample numbers and locations for all sites. The work plan includes actual sampling points, with the exception of Chapter 5 subsection 4. The work plan will be revised to emphasize that detailed field surveys have been done.

6. Approval of any portion of this work plan by EPA does not constitute approval of a voluntary corrective action at any SWMU. LANL shall provide a work plan for each proposed VCA.
LANL concurs. LANL will submit a VCA work plan per the technical assumptions document and other negotiated agreements between LANL and EPA, and any indications to the contrary in the text will be corrected.

7. LANL should provide dates (as available) for when MDA's, lagoons, pits, outfall, etc. become abandoned or inactive. LANL shall indicate whether units are permitted (RCRA, NPDES etc.) or are interim status.
In cases where such information is not already included, LANL will provide dates when various SWMUs or AOCs became abandoned or inactive. In cases where exact dates are not available, LANL will explicitly state that archival reviews and interviews did not provide exact dates that sites became inactive. LANL will also indicate the status of permitted or interim status SWMUs.

8. Discrete rather than composite samples should be collected in the following sections of the work plan: Section 5.4.4.3 (p.5-110), Section 5.14.4.2 (p.5-258), and Section 5.16.4.2 (p.5-278).
See responses to specific sampling plans below:
LANL will take discrete samples for septic outfalls (Subsection 5.4.4.3)
LANL will submit discrete samples from the bottom core or soil-tuff interface in the absence of positive field indicators (Subsection 5.14.4.2).
See response to specific comment 66a (Subsection 5.16.4.2).

9. All figures of SWMUs with sampling locations or which denote the locations of SWMUs should have contour lines.
LANL concurs. LANL will produce revised septic sampling figures, which will have contour lines depicted. For some of the septic systems there are no engineering drawings that indicate the location of drain fields. In these cases, locations of soil cores in the drain field will be made after field trenching documents locates the drain lines. LANL will verify that all other sampling figures have contour lines.

Specific comments:

1. Executive Summary, p. ES-6 Milestone Chart - Does the five years for completion of the RFI field work include completion of field work for the additional work plans being submitted in July 1994 and 1995? In addition, the HSWA permit requires submittal of the final CMS report within 10 years of issuance of the permit which is the year 2000. LANL's schedule shows a final CMS report in May 2002 twelve years after the effective date of the permit. In a letter dated June 27, 1994, EPA requested updated and revised schedules for all OUs, LANL may include their response to this question in the August 5, 1994 response.
The plan to update the schedule matrix has been submitted by the Project Office on August 5, 1994, and will be further discussed during your August visit to LANL.

2. 1.3 Description of OU 1082, p. 1-10 (last paragraph) - EPA's approval of this work plan does not demonstrate concurrence with the Laboratory units that are proposed for no further action (NFA). EPA will indicate which units do not need to be added to the permit for an RCRA Facility Investigation (RFI) and which may be requested for removal from the permit following a Class III permit modification.
LANL concurs. LANL will modify text to "these SWMUs will be proposed for a permit modification and formal EPA approval will occur when the permit modification is accepted."

3. Figure 3-1, p. 3-3 - It is unclear where the inset map (MDA P) belongs in this figure. LANL should indicate on the map where the inset is located.
LANL concurs. The location of the inset map will be shown more clearly on Figure 3-1.

4. 3.4.3.2 Soil, p. 3-10 - The soil-tuff interface on the Pajarito Plateau has not been sufficiently characterized for LANL to state that an impermeable clay zone often forms there.
LANL concurs. The paragraph will be deleted.

5. Table 4-1, p. 4-8 - Are the background concentrations listed specific to this OU, or are they general for the laboratory?
Background concentration data are general for LANL; however, some background samples were collected at TA-16. Footnote (7) on p. 4-8 will be modified to clarify this point.

6. 4.2.3 Voluntary Corrective Actions, p. 4-7 - EPA will approve VCA's on a site-by-site basis. All VCA's which are final remedies will require a Class III permit modification.
LANL concurs. LANL will submit a Class III permit modification as the mechanism of EPA approval of the VCA as a final remedy, and any indications to the contrary in the text will be corrected.

7. 4.2.4 Active Sites, p. 4-13 - EPA will evaluate corrective actions at active sites on a case-by-case basis. Inactive sites under active sites will be required to be characterized as is appropriate and may not automatically be deferred to decommissioning.

LANL concurs. Per our conversation of August 8, 1994, this determination will be made on a case-by-case basis and any indications to the contrary in the text will be revised.

8. 4.3.1 Potential Contaminants of Concern, p. 4-15 - What is the significance of an high explosive compound being used at TA-16 in quantities greater than 10,000 lbs? Were compounds not considered which were used in volumes lower than 10,000 lbs?
All compounds will be identified (via GC scans), but the compounds that were more commonly used (e.g., >10,000 lbs) will be identified and quantified when possible. Many of the less commonly used compounds listed in Table 4-1 do not have toxicological data and cannot be quantified using SW-846 methods. The text will be modified to clarify this point.

9. 4.3.3.1 Conceptual Site Model, p. 4-18 - The upper two feet are considered the surface soils for purposes of the RFI investigation and not the upper 6 inches as stated in this text. LANL shall revise text accordingly.
LANL concurs. Text will be modified to indicate that surface soil is generally 24 in., but samples will be taken to represent the soil horizon that is most likely to contain contaminants. Note that LANL soils are generally thin (< 3 ft.) so in many cases 0-24 in. will extend to the soil-tuff interface.

10. 4.4.1 Criteria for Recommending NFA, p. 33 - No further action (NFA) requests should follow the baseline risk assessment scenarios agreed to by the Technical Assumptions Task Force of 10^{-6} for carcinogens.
LANL concurs. See response to general comment 1. The text will be modified.

11. Table 4-9, Sample Sizes for Reconnaissance Sampling, p. 4-41 Until LANL can provide the standard operating procedure (SOP) for use of this table, and an explanation of how consistency in usage will be maintained, EPA cannot approve this sampling method. A review of the work plan shows that there is no consistency in use of the table; rather it appears that LANL chooses a number of samples they want to analyze and then goes to the table to determine the probability and fraction of site affected.
Per our conversation of August 8, 1994, within 90 days, LANL will provide a guidance document on the development of sample sizes for reconnaissance sampling using the nomogram table. The information in this document will ultimately be incorporated into the IWP.

12. 4.7.3 Analytical Laboratory Methods, p. 4-48 - LANL shall provide rationale for using a subset of metals from the SW-846 6010 analysis for metals. LANL shall provide an explanation for all the analysis tables which indicate that for "E Semivolatiles (SW 8270), a full suite is PAH". LANL must request a reduction in analysis from 40 CFR Part 261 Appendix IX and provide the basis for that request prior to the initiation of field work.
Based on an extensive review of H-Division reports, X-Division reports, GMX-Division reports, and WX-Division reports, LANL has direct evidence for the use of the following metals in processes at TA-16: barium, beryllium, cadmium, chromium, copper, lead nickel, silver, thallium, zinc and mercury (mercury was added during our research for Addendum I). LANL had proposed a reduced metal suite to control QA/QC and data validation costs relative to the full suite of 6010 metals. The ICP data for the other

metals (i.e. arsenic, selenium, tin) will be collected, but these data will not be extensively validated. Unless you advise otherwise, LANL will formally provide such a request for a reduction in QA/validation on select metals to EPA prior to initiation of field work.

The "full suite is PAH" statement is misleading. LANL's intention was to emphasize that PAHs are included on the analyte list for SW-846 Method 8270. This text will be clarified and the footnote with PAHs as a parenthetical note will be revised. This deletion will affect the sampling-analysis tables for aggregates 5.8, 5.9, 5.10, and 5.11.

5.1.1.1 Description and History, p 5-1:

13. SWMU 16-001(c), p. 5-4 - LANL shall provide the dimensions of this tank.
LANL concurs. Engineering drawing ENG-C-28874 shows TA-16-541, a blow-down tank, as 7 ft. long and 4 ft. in diameter. The volume of this tank is approximately 650 gals. The text will be modified to incorporate this information.

14. SWMU 16-001(d), p. 5-5 -

a. LANL shall provide information related to when this dry well was abandoned and when the floor grooves of building TA-16-208 were plugged if available.
The date that dry well was abandoned is not known. The discharge from the floor grooves was plugged in May 1993, following the Tiger Team visit. This information will be added to the text.

b. Were pesticides ever stored in TA-16-208? If pesticides were stored in this building then they need to be added to the analytical suite.
Pesticides were not stored in this building based on our archival research. It was a solvent/petroleum products storage building. Specific pesticide storage buildings existed at TA-3; it is unlikely that the operating group would have had any occasion to use pesticides at TA-16 inasmuch as pesticide application was a lab-wide activity.

15. Figure 5-4, p. 5-22 - SWMU 16-003(b) (6 inch VC pipe) is not shown on this figure. LANL shall provide a figure with the approximate location of this unit.
SWMU 16-003(b) is shown on Figure 5-1 as cited, but as a part of response to general comment 3 an additional copy of Figure 5-1 will be provided in this subsection.

16. 5.1.4 Sampling and Analysis Plans, p. 5-11 - Text indicates that SOPs for some field screening methods are in preparation. All SOPs should be finalized prior to initiation of field work.
LANL concurs. SOPs will be finalized before initialization of field work. Note the LANL-ER-AP-1.06 "Approval Process for External Procedures Used in the Environmental Restoration Program" is a mechanism for facilitating approval of other organization's SOPs as ER SOPs. We plan to use this procedure to finalize SOPs for the HE spot test and the field-based XRF.

17. 5.1.4.3 Sampling, p. 5-13 - LANL shall choose a minimum of three surface samples for laboratory analysis.

LANL concurs. The number of surface samples will be increased to three samples, and the design criteria will be modified to reflect that each blowdown tank will have a minimum of one surface sample each. The sampling Figure 5-3 and the sampling Table 5-3 will be modified.

18. 5.2 HE Sumps and Outfalls, SWMUs 16-003(a-j, l-o), 16-026(b-e, v, h2,j2), 16-029(a-g), 16-001(e), p. 5-16 - LANL shall sample all sumps and outfalls especially active sumps which may continue to discharge hazardous constituents to the environment. LANL may not wait until these units become inactive. LANL shall submit sampling plans for the active outfalls and all sumps within 60 days of receipt of this NOD, and sampling shall occur in FY95.

Per our conversation of August 8 1994, LANL will sample all outfalls (active and inactive). If contamination is detected in the outfall, then all sumps upstream of that outfall will be sampled. Sampling of sumps upgradient to contaminated outfalls will include a visual inspection of the interior of the sump and a single angle coring under the sump. LANL will submit revised sampling figures and plans for these SWMUs for EPA consideration by September 16, 1994.

19. 5.2.1.1 SWMU Descriptions and Histories, SWMU 16-029(g), p. 5-39 - When LANL is using archival information such as an interview from a former lab employee, a location of their work place and dates worked there should be indicated. Text states "Richard Daly, a longtime employee at S-site and past group leader of WX-3 states that no plating operations were ever conducted in the building". The building in question (TA-16-450), was constructed in the early 1950's. Was Mr. Daly employed at S-Site during the early 1950's and later?

Mr. Daly began working as a staff member with GMX-3 at S-Site in 1956. He was promoted to Deputy Group Leader in 1977 and Group Leader in 1980. He retired in 1983. The text will be modified to reflect this information.

20. 5.2.2 Remediation Decisions and Investigation Objectives, Problem Statement (DQO 1), p. 5-57 - Sampling at NPDES outfalls is conducted in order to determine if surface water quality is being impacted. If an outfall was being used prior to being permitted then there were no limits on discharges at that time. Sampling at the outfall does not take into consideration the accumulation of material in the soil at or below an outfall. This material is not sampled under the NPDES permit, and there is no corrective action authority for cleaning up contamination under the NPDES permit. How does the outfall for TA-16-340 relate to the sampling done in Water Canyon?

LANL concurs that NPDES effluent sampling is not adequate to characterize the soil located at locations which received discharge prior to NPDES permitting. The currently permitted discharge is adequately sample and monitored per LANL's NPDES permit. Please note that TA-16-340's monitoring adequately characterizes the discharge from the outfall. LANL will be sampling the historically potentially impacted sediments and soils at many NPDES outfalls (see response to specific comment 18 above). Sampling in Water Canyon was mentioned to show that there is no off-LANL migration of contaminants released from TA-16. The text will be clarified.

21. Decision Logic (DQO Step 5), p. 5-61 - LANL has shown no correlation between the deposition of high explosives (HE) and other hazardous constituents.

If LANL removes portions of the drainage based only on the HE content then additional contamination may be missed. LANL shall define the extent of the contamination.
The strategy behind the sampling and analysis plans for these drainages may not have been clear. First, the HE spot test will define the portion of the drainage that is HE contaminated. Existing data shows only HE contamination. Second, LANL will propose a mini-VCA for the HE-contaminated portion of the drainage. Third, sampling will occur in the portions of the drainage adjacent to the VCA (mostly downgradient) and below the remediated area. The laboratory sampling will be based on the complete list of PCOCs for each sump/drainage SWMU (see Table 5-20), enabling LANL to evaluate other hazardous constituents on the portion of each drainage that was not remediated during the VCA. LANL will add one (for a total of two) subsurface core in the contaminated zone to further define the concentrations of potential contaminants with migration properties different from HE. This strategy assumes that there will be no waste disposal or treatment issues relating to the HE-contaminated zone. The DQOs and sampling plans will be clarified to reflect this decision process. These five lab samples in the surface drainage and two cores in the subsurface should define the extent of all PCOCs in each drainage. (These sampling plans were designed in support of the potential VCAs).

22. 5.2.4 Sampling and Analysis Plans, p, 5-62 -

a. How will samples be collected (spade and scope)? This should be indicated in the text and the SOP should be cited.
LANL concurs. LANL will modify Table 5-19 to include spade and scoop (LANL ER-SOP 06.09), and references to the type of surface samples taken by each SOP will be clarified.

b. On page 5-80, first paragraph the fourth sentence indicates that all sample locations will be analyzed for HE, metals, semivolatile organics and radionuclides. Does this mean all samples which are field screened, or does this mean the samples which are defined as clean through the HE screening? By comparing text with the analytical charts it is not clear where samples will be taken for laboratory analysis.
LANL concurs. LANL will clarify the text. The intention is to analyze five surface samples downgradient of where there are no positive HE spot test readings in the laboratory (3 plus 2 as described in the text).

c. Will the three samples taken in the auger core be analyzed for HE, metals, semivolatile organics and radionuclides?
The auger samples will be analyzed for HE, metals, VOCS, SVOCs, and radionuclides (the latter in drainages from buildings handling uranium). LANL will modify text to be more consistent with Table 5-20 where organics refers to volatile and semivolatile organic compounds.

23. 5.2.4.2 Sampling, p. 5-79 - SWMU 16-029(g) samples are listed for radiation screening in Table 5-20, p. 5-66, but not listed in the text. LANL shall clarify.
LANL concurs. LANL will add SWMU 16-029(g) to the text on pg. 5-79 for radionuclide analyses.

24. 5.3.2 Remediation Decisions and Investigations Objectives, p. 5-87 -

a. This area is highly contaminated and sampling should not be delayed until the line is plugged. LANL shall sample this area in FY95, and this includes the sampling of the sumps and especially the feeder troughs.
Per our discussion of August 8 1994, in FY 1995 LANL will sample the portion of the TA-16-260 outfall where there is no water flowing. The major goal of this effort is to determine if characterization of contamination is adequate (we know HE and barium are present, but other constituents are poorly characterized). This sampling will also address waste disposal and remediation data needs. We will also propose five angle samples under TA-16-260 sumps and five under troughs in support of a baseline risk assessment for these units using a construction worker scenario. The locations will be based on visual inspection for cracks and flaws in the units.

b. LANL shall sample and analyze the effluent from the NPDES outfall permitted as EPA05A056 for all the parameters as required under permit number NM0028355. LANL shall also analyze this sample and determine the concentrations present of TNT, RDX, HMX, acetone, methyl ethyl ketone, n-butyl acetate and toluene. LANL shall indicate which methods are being used for analysis and the detection limits of those methods. Sampling should occur within thirty-days of receipt of this NOD, and the results shall be sent to EPA upon receipt from the laboratory.
LANL concurs. A sample was collected on August 3, 1994, and the request information is provided on Attachment A. N-butyl acetate is not a standard SW-846 analyte, and thus probably cannot be analyzed. We should see a peak for it on the gas chromatograph for volatiles if it is present. N-butyl acetate is not particularly toxic. According to LANL CST-9 (the environmental chemistry group), the detection limit for acetone by a gas chromatographic method (SW 846 8240) is 20 ppb, that for toluene is 5 ppb, and that for methyl ethyl ketone is 20 ppb. According to LANL DX-16 (the explosives development group), the detection limits for HE by HPLC (SW 846 8330 or equivalent) are: TNT = 0.068 µg/l (ppb) RDX = 0.27 µg/l (ppb) and HMX = 0.21 µg/l.

25. 5.3.4.2 Sampling, p. 5-94 - LANL shall revise their sampling plan to include full laboratory analysis for VOCs, SVOCs, metals and HE and its by-products for every 20 feet until 100 feet from the HE pond. Then a surface sample (0-6 inches) should be collected every 60 feet for full laboratory analysis.

Also, samples deeper than 6 inches should be taken in the drainage where sediment may have accumulated. LANL should also take three samples at the 6 inch to 2 foot depth within the first 100 feet from the pond, and analysis should include VOCs, SVOCs, metals and HE products and by-products.
Per our conversation of August 8 1994, LANL will collect samples every 20 ft. until 100 ft. beyond the pond and then collect surface samples every 60ft.. In addition we will take 3 samples at the 6 in. to 2 ft. depth within 100 ft. from the pond. Surface samples will be analyzed for SVOCs, metals, HE and HE by-products. Subsurface samples will be analyzed for VOCs, SVOCs, metals, HE, and HE by-products. The text will be modified to reflect these changes.

26. 5.4.1 Background, SWMU 13-003 (a,b), p. 5-97 - Action will not be deferred until decommissioning and demolition (D&D). Should sampling in the

drain field or outfall indicate contamination then the rest of the system will be required to be sampled prior to D&D.
The septic tank was removed in 1951 (see history on p. 5-98), and other statements that call the removal of the tank into question will be revised (problem statement on p. 5-103). The former location of the septic tank is partly beneath a walkway, a transformer station, and a parking lot, which should prevent migration of any potential releases from the tank. In addition, the historic removal of the tank eliminates the primary source of potential contamination for this portion of the septic system. Therefore action for the decommissioned system should be deferred until D&D. The drain field [SWMU 13-003(b)] is scheduled for sampling during RFI Phase I. Per our conversation of August 8 1994, LANL will provide a drawing that shows the SWMU and the surrounding buildings and transformer station. (see Attachment B).

27. 5.4.1.1 Description and History, p. 5-97 - Figure 5-52 does not show the drain lines from TA-11-4 and TA-11-1. Only the drain field is indicated in the figure. LANL shall revise the figure to indicate the location of the drain lines, and septic tanks to the drain field. In the future, it would also be helpful that if a figure was not located with text, the page number of the figure would be included in the text (e.g. Figure 5-52, p. 262).
LANL concurs. LANL will include drain lines and the tank on the figure if their locations can be determined. Figure 5-52 will be revised to show this drain line and sampling points. In the future if figures are not located in the same subsections as text, then the relevant page numbers will be cited.

28. Design Criteria (DQO Step 6) p. 5-104 through 5-107 - The explanation for the drain field for these units is incomplete. Are the lines in the drain field perforated so that material flows out along the line, or does it only flow out at the end of the line? The size of each drain field is not included in this work plan; therefore, LANL shall submit a figure for each drain field indicating the locations samples will be collected. EPA cannot evaluate if the sampling proposed is adequate based on the information presented. LANL may propose a similar sampling approach for these systems, but enough information should be provided for EPA to determine that the sampling proposed is adequate.
LANL concurs. LANL will add details on the construction of the septic systems where available. Sampling figures for each drain field will be provided.

29. 5.4.4.1 Engineering Surveys, p. 5-107 - All geomorphic mapping should have been completed prior to submittal of the work plan. Actual sampling locations should be in the work plan.
LANL concurs. Where possible, the proposed sampling locations will be added to sampling figures. See responses to general comment 5 and specific comment 28.

30. Outfalls, p. 5-110 - An additional sample should be collected at each outfall from the soil/tuff interface and analyzed for VOC, SVOCs, metals, HE and HE by-products.
LANL concurs. LANL will collect an additional sample at the soil-tuff interface where there is more than 6 inches of soil. LANL will modify the design criteria to indicate that some PCOCs (i.e. VOC) will not occur at the surface and historic releases may have degraded from the surface.

31. 5.5.4.1 Engineering Surveys, p. 5-117 - Site mapping should have occurred prior to submittal of the work plan. A detailed figure should be included with sampling locations indicated.
See response to general comment 5.

32. 5.5.4.2 Sampling, p. 5-117 - One sample is not adequate for this site. An additional sample should be collected five feet from the first sample. The sample should be collected to the soil/tuff interface and analysis should be for metals, VOCs, SVOCs, and cyanide.
LANL concurs. An additional soil core will be taken at a 5 ft. downgradient location. The purpose of this additional sample will be to collect a sample that is representative of the more mobile potential contaminates, and the design criteria will be revised to reflect this reasoning. If more than 6 in. of sediment are present, then two samples will be collected for laboratory analysis per core. The surface samples will be analyzed for metals, SVOC and cyanide. The second sample (>6 in. taken at the soil-tuff interface) will be analyzed for metals, VOCs, SVOCs, and cyanide.

33. 5.6.1.2.1 Nature and Extent of Contamination, p. 5-122, second paragraph - Explain the meaning of this sentence, "Silver concentration in the soils followed a much more erratic pattern and was always lower in silver than the sediment". In addition, the data from this report (Kasunic et al., 1985) should be included in the work plan.
LANL concurs. The sentence is not clearly written, and will be edited to state the following "Silver concentration in the soils followed a much more erratic pattern, but silver concentration was typically lower in the soil than the associated sediment."
LANL will provide the Kasunic data in tabular form in the work plan. See Attachment C to this NOD response.

34. 5.6.4.2 Sampling, p. 5-130 - The proposed sampling plans do not adequately delineate the extent of the contamination. Data excerpted from Kasunic et al. (1985) indicates that at 33 ft down channel the concentration of silver at 3-ft depth was 182 ppm. Sampling should be conducted so that a clean zone beneath the contaminated zone is delineated. Additional corings are required and samples should be collected at the surface (0-6 in.), at 3 feet depth, and at 5 feet depth beginning at the outfall and continuing every 25 feet for the first 100 feet of channel.
LANL concurs. Samples will be collected at 0 ft., 25 ft., 50 ft., 75 ft., and 100 ft. from the outfall. Samples will be collected at the surface, 3 ft depth, and 5 ft depth.

35. 5.6.4.3 Laboratory Analysis, p. 5-130 - How does LANL know that silver and cyanide are the only constituents of concern? Were any solvents used in the photoprocessing? What type of acids were used? LANL shall provide an explanation.
LANL concurs. It is not known whether solvents were used. A 1955 encyclopedia lists commercial film developers as including organic reducing agents such as phenols and amines. VOCs and SVOCs will be added to the analyte list for this SWMU. Acids used in TA-16-222 included: acetic acid, boric acid, and sulfuric acid.

36. 5.7.3 Data Needs and Data Quality Objectives, DQO Step 4,

p. 5-141 - LANL should consider a slant boring approach underneath most of these structures in order to determine if the soil has been impacted by past releases.
The waste water treatment plant is now entirely decommissioned, so there is no longer any reason to hesitate to sample under the units in the most effective way possible. Slant borings are not required. LANL will coordinate the D&D activities with the characterization activities proposed in the work plan. If D&D has occurred prior to field work (and LANL will attempt to ensure that this happens), then LANL will take a 5 ft. core in the excavation produced by removal of each unit. Locations of these cores will be biased by field screening and/or visual indication of cracks/leaks. If D&D has not occurred, then LANL will drill a vertical borehole through each unit to a depth of 5 ft. beneath each unit. The core location would be biased to any zones of obvious cracking/staining based on visual inspection following pumping our water in the units. Following any boring through a unit, each borehole will be plugged with cement to prevent any mobilization of constituents. The text will be modified to reflect this approach.

37. 5.7.4.1 Engineering Surveys, p. 5-145 - LANL shall provide figures with the field surveyed SWMUs and sampling locations. This should have been done prior to submittal of the work plan.
See response to general comment 5.

38. 5.7.4.2 Sampling, p. 5-145 -

a. LANL indicates that cored samples will be taken, and then indicates that these samples will be collected at 0-6 in. These statements are contradictory, LANL shall take an additional sample at the soil turf interface or at 2 feet depth which ever comes first.
LANL concurs. Text will be clarified. We will add an additional analysis for the core segment at the soil-tuff interface or at 2 ft., if there are more than 6 in. of sediment.

b. Page 5-147, 1st paragraph - EPA does not understand the reasoning for drilling to three-quarters of the thickness of the Imhoff tank. If LANL is concerned that the tank has leaked then they should drill through the tank or slant drill under the tank. If LANL is concerned that the tank has absorbed hazardous material and is hazardous then, a chip from the first several inches of the bottom of the tank should be analyzed to see if the tank needs to be disposed as hazardous waste. What does LANL mean by the entire core sample will be sent to the laboratory for analysis? LANL shall provide an explanation.
LANL concurs. LANL proposed drilling 3/4 of the way through the tank to avoid providing a pathway for migration to the subsurface (This was a concern when the system was active). LANL was analyzing the tank to determine if it was hazardous waste. The 'entire core' sample was deemed to provide an adequate amount of material for all required lab analyses. LANL will use the D&D SOP (SOP # not known) for sampling concrete, and the revised work plan will cite this SOP.

c. Page 5-147, 2nd paragraph - LANL shall explain the rational behind Table 5-43. Randomization of samples is not appropriate for this area. Any samples which are to be analyzed for VOCs should be field screened and collected in a manner so as to not drive off the VOCs.

The samples submitted for laboratory analysis were identified through randomization where there are no positive field screening indicators. It is extremely unlikely that randomization will be used. LANL will clarify this point in the text. This procedure will not impact the collection of VOC samples (LANL-ER-SOP-01.02, R0), which are collected in such a manner as to not drive off the energetic VOCs.

39. 5.8.1.1 Description and History, Figure 5-34, p. 5-150 -LANL shall include the location of all the active units which are listed as SWMUs on this figure.
LANL concurs. LANL will include all active units that are listed as SWMUs on this figure.

40. 5.8.1.2 Conceptual Model, p. 5-156 -

a. Page 5-156, paragraph one - LANL shall clarify the portion of the text which refers to the barium concentrations in the drainage from SWMU 16-016(c) and in the southern drainage. If available the sampling locations should be included on a figure and the results of all the samples indicated rather than a range.
LANL concurs. LANL will include a table and figure with the actual data for SWMU 16-016(c) and the southern drainage in the revised work plan. See Attachment D to this NOD response for a list of the data.

b. Paragraph two - LANL shall provide the actual data from the single soil sample rather than indicating if SALs were exceeded (Raper and Brown et. al.).
LANL concurs. LANL will include the actual data.

41. 5.8.2 Remediation Decisions and Investigation Objectives, p. 5-156- LANL indicates that the open burn/open detonation units are operating under a permit. Technically these units are interim status and are not permitted yet.
LANL concurs. The words "interim status" will be added to the text on p. 5-156.

42. 5.8.3 Data Needs and Data Quality Objectives, p. 5-161 - EPA does not agree with assumption number 3 [that the secondary contaminants of concern (semivolatiles, metals other than barium) do not have a different deposition and transport mechanisms than HE, uranium, and barium so field screening for these three contaminants will allow LANL to locate probable high concentrations of other potential contaminants of concern]. This assumption is not valid and may not be used.
LANL concurs. Assumption 3 is deleted and the following assumption is made in its place "HE and barium are the most likely constituents to present a health risk and screening for these constituents may help define the location of the highly contaminated zone."

43. 5.8.3 Sampling, SWMU 16-010(i), p. 5-164 - LANL should also take a sample from below the buried pipe at the end of the pipe's length.
LANL concurs. The text has been revised to indicate that a sample will be collected from below the buried pipe at the end of the pipe's length.

44. 5.8.4.2 Sampling, p. 5-167 through 5-171 -

a. SWMU 16-010(a) -

i. LANL shall collect samples at the following depths at the locations with the three maximum barium values: 0-6 inches, two feet and five feet. These samples shall be analyzed for semivolatiles, metals, HE and cyanide. LANL shall provide information on the correlation between field screening for barium using the XRF and laboratory analysis.
LANL concurs. LANL will modify the text, sampling table, and sampling figures to indicate that subsurface samples will be collected. Per our discussion of August 8 1994, the detection limit for the field XRF is 10 ppm (see Attachment E), the laboratory detection limit is 0.2 ppm (method 6010), and the SAL for barium is 5600 ppm.

ii. Table 5-46 - LANL shall indicate what analysis shall occur for the ten additional samples which may be collected based on HE screening (only 3 samples are indicated in this table).
LANL concurs. LANL will indicate in Table 5-46 that the same analyses will be conducted on all of these samples.

b. SWMU 16-016 (c) -

i. LANL shall provide a figure indicating the location of MDA P in relation to the drainage and samples to be collected.
LANL concurs, LANL will add the boundary of MDA-P to the sampling figure for SWMU 16-016(c).

ii. Table 5-46 - LANL shall provide an explanation why the two out of four potential samples located in this unit are not be analyzed for semivolatiles and cyanide as are the samples in SWMU 16-016(a). In addition, the table shows 8 samples being analyzed. If field screening indicates barium may have been stored at this area then LANL shall take core samples at 2 feet and 5 feet and analyze for semivolatiles, metals, HE and cyanide.
LANL concurs. LANL will add semivolatiles and cyanide as analytes to all eight samples for SWMU 16-016(c). The text will be clarified to remove the suggestion that only four samples will be taken. Per our discussion of August 8 1994, LANL will collect a deeper additional sample, where field screening indicates barium contamination. Thus, if barium contamination is detected at the surface, then an additional sample will be collected at 2 ft., and then an additional sample will be collected at 5 ft. if barium contamination is detected at 2 ft.

iii. LANL shall extend the area of sampling to the intersection with Cañon de Valle rather than stopping at 210 feet. A sample should be sent for full laboratory analysis every 30 feet until this intersection occurs. Field screening may be used to potentially determine the lateral extent of barium contamination in the drainage ditch; however full delineation of the extent of contamination, including depth, will be required. Therefore, for the three highest field screened areas for barium within the ditch, LANL shall collect samples at the two foot depth and conduct full laboratory analysis.

LANL concurs. LANL will collect these additional samples downgradient to the Canon. Also, LANL concurs with taking additional depth samples in the ditch. The text and figures will be modified to reflect this change.

c. SWMU 16-010 (h), p. 5-169 - It is unclear from the diagrams and text here and in the rest of the chapter where the potential release of contaminants occurred. Text on page 5-152 indicates that the HE residues were emptied into a floor drain located on the south end of the building which went to the troughs. Is LANL sampling under the connections to the drainage troughs? LANL should provide a better explanation for their sampling rationale. In addition, several samples should be taken deeper than 0-6 inches.
Possible release points are: 1) the one existing trough exit on the south side of the building, 2) the three filled trough exits on the south side of the building, and 3) the stained holes in the building wall on the south side of the building. This additional detail will be added to the work plan. LANL is sampling under the drainage trough connections. We will modify the description of sampling to indicate that in the absence of positive field screening results, the laboratory samples will include the sampling points beneath the troughs and beneath the holes in the building. The laboratory samples will be taken from the surface and a depth of 3 ft or the soil-tuff interface (if the soil-tuff interface is less than 3 ft deep). Two laboratory analyses will be submitted per sampling location.

d. SWMU 16-010(l), p. 5-170 - LANL shall conduct full laboratory analysis at a minimum of ten sites rather than a minimum of three sites. At the three samples with the highest field screening results an additional sample should be collected at two feet or the soil/tuff interface (3 samples at 2 feet) and undergo full laboratory analysis.
Per our discussion of August 8 1994, LANL will collect a minimum of three samples with additional samples submitted for laboratory analysis given positive HE field screening. No subsurface samples will be directly allocated to this trough. Rather, they will be distributed per the original plan among all the troughs based on field screening.

e. South drainage, p. 5-171 - At the three locations where sediment traps are sampled, a deeper sample at the sediment to tuff interface should also be analyzed for SVOCs, metals, HE and cyanide.
LANL concurs. LANL accepts additional samples at depth, and will also change sampling tables and figures.

<u>Cañon de Valle</u>

45. 5.9.3 Data Needs and Data Quality Objectives, p. 5-178 - LANL shall explain what is meant by "realistic exposure scenarios".
LANL concurs. The text will be rewritten to the following "but the risk to human health remains to be quantified."

46. Design Criteria (DQO Step 6), p. 5-181 - Text in the first paragraph indicates that 30 samples are adequate for an initial baseline risk assessment while text in the second paragraph indicates that only 10 samples will be submitted for laboratory analysis. In addition, Table 5-52 indicates that 40 sediment samples will be sent for laboratory analysis. LANL shall clarify how many samples are actually being taken and submitted for laboratory analysis.

LANL concurs. The design criteria paragraph 1 has been clarified to the following: "A total of 40 laboratory samples [30 0 to 6 in. and 10 deep-surface/subsurface samples (6-12 in. or 12-18 in. or soil-tuff interface)] from Cañon de Valle will be submitted for laboratory analysis. The purpose of surface sampling Cañon de Valle is to obtain information about contaminant migration and transport. The samples will be located to provide approximately uniform coverage of the region of interest. Geomorphologic mapping will provide information on the heterogeneity of sediments and rock outcrops in the canyon bottom. In Cañon de Valle, 30 sediment traps and associated water will be selected so that a sample for laboratory analysis is taken approximately every 200 ft. These samples of sediment traps will be selected to provide adequate coverage of the diversity of sediments in the canyon, based on the geomorphologic mapping. Professional judgment suggests that 30 samples will be adequate for a baseline risk assessment."

47. 5.9.4.2 Sampling Cañon de Valle, p. 5-184 - Text here and under Decision Logic (DQO Step 5) indicate that subsurface sampling is being performed. The sampling indicated is not considered subsurface by EPA. The top two feet are considered surface soils. LANL shall revise text in response to this comment. It is unclear from the text how many samples will be selected from below the 0-6 inch depth. LANL shall provide clarification.
LANL concurs. LANL agrees with EPAs definition of subsurface soil, and samples deeper than 6 in. will be considered deep-surface samples. This will be clarified in the text. LANL will rewrite the section describing selection of the samples from below 0-6". The hierarchy of biasing is: 1st) samples with positive HE field screening results; 2nd) the highest Ba samples by field screening to a total of 10 samples below 0-6".

MDA R, SWMU 16-019

48. 5.10.1.1 Description and History, p. 5-186 - LANL shall provide a figure of the site based on the 1984 aerial photographs or indicate on Figure 5-41 the location of the original three burning areas.
LANL concurs. LANL will indicate the approximate former location of the three burning pits in MDA R.

49. 5.10.1.2.1 Nature and Extent of Contamination, p. 5-187 -Why are the potential contaminants of concern (PCOC) different than the contaminants of concern listed (e.g. semivolatiles, fuel oil). Table 5-53 should include these potential contaminants. LANL shall revise the table to include all contaminants of concern.
LANL concurs. LANL will revise Table 5-53 to include semivolatile organics.

50. Design Criteria (DQO Step 6), p. 5-193 -

a. Paragraph two - The probabilities for the statistical analysis are low; EPA would like to see a probability of 90% if 10% of the site was contaminated for the surface. Therefore, LANL shall take 22 near surface samples.
LANL concurs. LANL will modify the text and the sampling figures and tables to indicate that 22 near-surface samples will be collected.

b. Paragraph three - The probabilities for the statistical analysis seem low; therefore, EPA would like to see a probability of 90% if 15% of the site is contaminated or 15 samples from the drainage.
Per our discussion of August 8 1994 on the likely homogeneity of the potential contamination in the drainages, LANL will not modify the original sampling plan for the drainages.

51. 5.10.4.2 Sampling, p. 5-197 -

a. Second paragraph, - EPA recommends that of the randomized samples six become biased samples which will be collected at obvious drainages near the canyon rim and the topographic depressions within MDA-R. In addition, if the bottom 6 inch interval is above background for radiation, barium or HE then it should be submitted for laboratory analysis.
LANL concurs. LANL will modify the text to indicate the approximate location of these biased samples. LANL will also indicate in the revised text that if the bottom interval is above background, then this interval will be submitted for lab analysis.

b. Fourth paragraph, Eight drill cores - If LANL only takes one of the 1-6" samples for analysis then the actual vertical extent of contamination will be hard to define. Rather, if one of the segments other than the bottom 6 inch segment has a positive reading then LANL shall also submit the bottom segment for laboratory analysis. If the bottom segment of the core segment has a positive reading then LANL shall core deeper, and take an additional sample every two feet until no positive readings are made for HE, radiation or barium. LANL shall also sample and analyze the 15 randomized three-foot cores in the same manner, thereby defining the depth of any contamination.
LANL concurs. LANL will submit an additional core segment for laboratory analysis where there is a positive field reading. We will core deeper if the bottom segment has a positive reading and take an additional sample every 2 ft. until no positive readings are found. This approach holds for both 3 ft. and deep cores. The appropriate text for this aggregate will be modified.

52. 5.10.4.3 Laboratory Analysis, p. 5-199 - LANL shall submit a list of the semivolatile organics for which analysis is being conducted.
LANL is proposing to analyze the full complement of SW-846 Method 8270 semivolatile organics. The reference to PAHs in Table 5-55 will be deleted.

<u>5.11 Surface Waste Disposal Areas, SWMUs 16-009 and 16-016(a,b)</u>

53. 5.11.1.1 Description and History, p. 5-202 - SWMU 16-016(b) - What types of HE contamination were found in the CEARP field survey and at what amounts?
The release site data base mentions HE as a COC and cites CEARP. LANL has no information on the specific types and amounts of HE used, but we hypothesize that the indication of HE was a positive HE spot test.

54. 5.11.4.3 Sampling, SWMU 16-009, p. 5-210 -

a. Three samples over this area (approximately 180,000 sq. ft.) is not adequate. LANL shall analyze a minimum of twenty samples from this area. If a surface soil sample indicates radioactivity or barium levels above background then the

bottom portion of the 3 foot interval should also be sent in for analysis. This extra sample should be in addition to the minimum of twenty samples required. In addition, LANL does not know that this area was not used for burning HE; therefore fifty percent of the samples should at least be field screened for HE. If field screening indicates positive results then laboratory analysis should occur for those samples.
Per our discussion of August 8 1994, LANL will apply a 25 ft grid over the location of highest expected contamination, the former 100 by 100 ft bermed area. From these 25 field screening locations five laboratory samples will be selected based on field screening results for barium and radiation. Per our discussion, we will not use the HE spot test on these samples. This revised sampling plan will also indicate that in the case of positive screening hits on the surface, the bottom portion of the 3 ft. cores will be sent for separate lab analysis.

b. LANL shall provide a better explanation of how samples will be collected from this area. Are 6-inch sections from each three foot core being screened as in other parts of the work plan, and then will that 6 inch sample be sent for analysis if field screening indicates barium or radioactivity above background? How and over what interval will the samples be homogenized?
LANL proposes to screen three 6-in. core segments (one per foot), and field screening results will be used to select one core segment for laboratory analysis. If there are no positive field screening indications, then LANL will submit the 12 to 18 in. core segment for laboratory analysis. The text will be clarified.

c. SWMU 16-016(b), p. 5-213 - Any surface samples with positive HE field screening results should be submitted for laboratory analysis.
LANL concurs. The text will be rewritten to indicate that all positive HE screening results will be submitted for laboratory analysis.

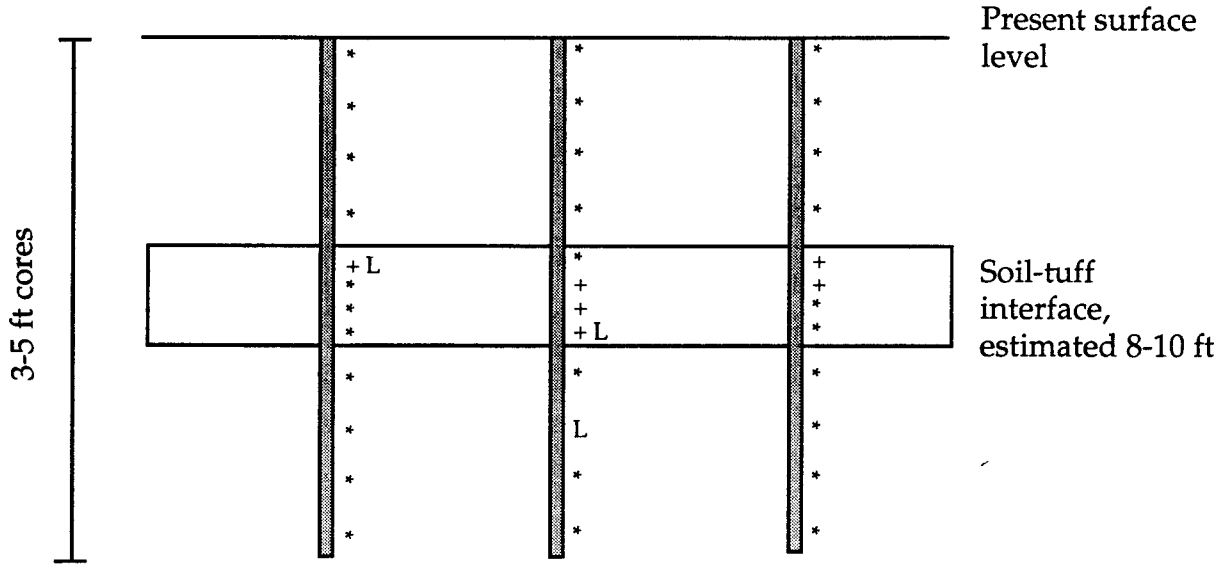
<u>TA-16 Waste Water Ponds Aggregate, SWMU 16-007(a) and SWMU 16-008(a)</u>

55. 5.12.4.2 Sampling, p. 5-222 - SWMU 16-007(a) -

a. LANL shall not homogenize over the 5 ft. core interval for one sample. LANL shall obtain samples from 6 inches or less of core. This will allow for less dilution of the sample and make it easier to determine the depth of any contamination.
LANL concurs. LANL will screen the 5-ft. cores at 6 in. intervals.

b. The original description of these ponds indicates that material was probably deposited between 8 and 10 feet depth from the surface; therefore, cores to a depth of 10 feet may not adequately define the possible contamination. LANL shall core to a depth of 15 feet at each sampling location. Should field screening not indicate any potential contaminants of concern then LANL shall submit a sample from the 8-10 ft. depth for two out of the three cores drilled in each pond. This will make a total of 8 samples sent for laboratory analysis.
LANL concurs. LANL will core to 15 ft and take 12 field screening samples per core and 3 laboratory analyses per pond (total of 108 field screening and 12 laboratory analyses for the SWMU). Details of this plan will be provided in the work plan revision.

Modified Sampling Plan with Example Biasing Results



* = field screening locations

+ = positive field screening locations

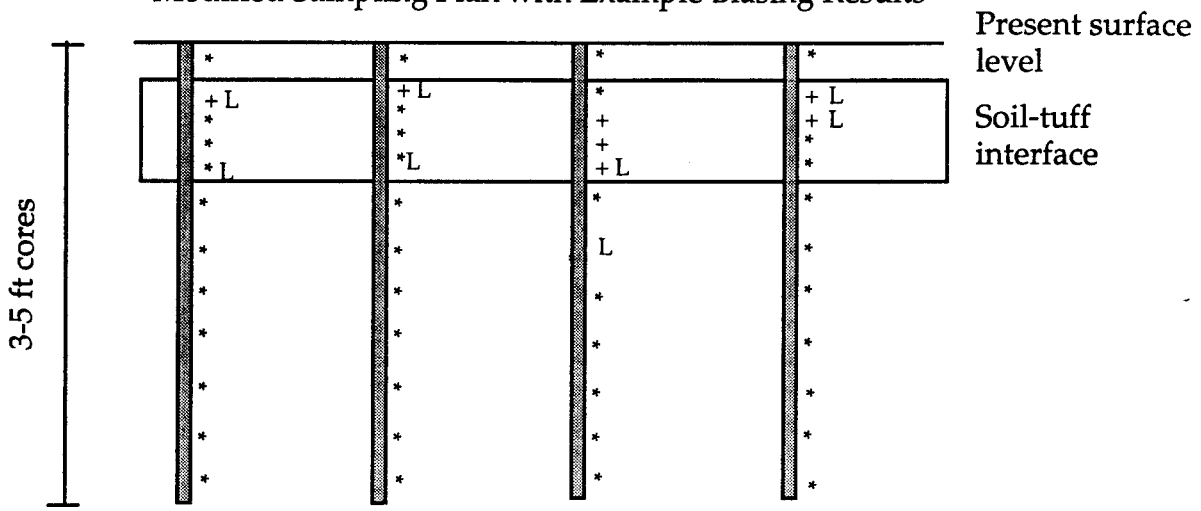
L = samples submitted for laboratory analysis, given this pattern of field screening hits

56. SWMU 16-008(a), p. 5-224 -

a. LANL shall not homogenize over the 5 ft. core interval as above, but should obtain samples from 6 inch intervals. Should the bottom 6 inches of core indicate potential contaminants of concern (PCOC) then the depth of contamination should be delineated and an additional 5 ft. core should be taken. This core should also be screened and an additional sample analyzed where any PCOC are indicated. If no PCOC are indicated then the sample 2 ft. below the last positively field screened interval for PCOC should be submitted for analysis.

LANL concurs. The general strategy for these cores will be similar to that described for SWMU 16-007(a). LANL will collect 6 in. core segments through field screening (12 per core for a total of 48 with emphasis on the pond bottom/soil-tuff interface) and submit two core segments for laboratory analysis per core based on screening (total of 8 laboratory analyses for the SWMU). In cases where the bottom 6 in. indicate contamination, the cores will be continued so that a 'clean' sample can be collected. Details of this plan will be provided in the revised work plan.

Modified Sampling Plan with Example Biasing Results



* = field screening locations

+ = positive field screening locations

L = samples submitted for laboratory analysis, given this pattern of field hits

b. A comparison of Figure 5-46 and text for sampling of this SWMU is confusing. LANL shall explain the total number of cores that will be taken and field screened for PCOC.
LANL concurs, and the text will be clarified. See response for 56a.

<u>TA-13 (P-Site), SWMUS 13-001, 13-002, 13-004, 16-035, 16-036</u>

57. 5.13.1.1 Description and History, p. 5-229 - LANL shall provide an explanation or better history description for SWMUs 16-035 and 16-036. Why does LANL suspect contamination beneath the bunkers?
LANL will expand the historical description of SWMUs 16-035 and 16-036. LANL suspects historic contamination because of several memos (written by Buckland in the late 1940s) that suggested polonium contamination in the bunkers. Since polonium has a short half-life (138 days), this contamination would have decayed in the intervening years. Other constituents are likely to be of minor importance. This information will be clarified in the work plan. In summary, LANL does not expect current contamination at these SWMUs.

58. Design Criteria (DQO Step 6), p. 5-234 - SWMUs 13-004, 16-035, and 16-036 - What percentage of these SWMUs is anticipated to be contaminated? LANL indicates two very different levels of contamination and probability of detecting that contamination. LANL shall provide an explanation for the sampling size. In addition, EPA would prefer to see a minimum of 90% probability of determining if contamination is present.
Given the historical information provided in response to specific comment 57, LANL does not expect any significant contamination within these SWMUs. As discussed on August 8, 1994 we view this as a 'not very serious' SWMU that doesn't warrant 90%

certainty. Therefore, the samples represent an extensive sampling of these units to test this assumption.

59. 5.13.4.3 Sampling, p. 5-239 -

a. Figure 5-48 does not show the location of the drainage or drainage samples. LANL shall provide a figure with this information.
Figure 5-48 does show the drainages in detail. The figure will be revised to show these features more clearly (as was done for drainages in Figure 5-41).

b. In addition the survey grid (Figure 5-48) does not cover the entire SWMU 13-002. LANL shall provide an explanation for this.
The boundary for SWMU 13-002 was drawn based on the cleared area in a 1948 aerial photograph. Visual inspection of the SWMU shows an area of high concentration of boulders about 200 ft from the firing point. We hypothesize that this is the limit of the bulldozed area. Sampling is not designed to continue beyond this point for SWMU 13-002 (the additional samples are for SWMU 13-001). This information will be added to the text.

c. It is unclear from text how the 38 samples for laboratory analysis will be selected from this firing site. Shallow surface sampling (0-18 inches) in prominent drainages and topographic lows could be used to supplement the grid samples.
LANL concurs. LANL will rewrite to clarify the text. Rather than collecting samples at randomized grid locations, samples will be biased to prominent drainages and topographic low points. The proposed samples in the north and south drainage channels will be collected to represent the 0 to 18 in. soil profile (in 6 in. increments) rather than the 0 to 6 in. layer.

d. SWMUs 13-004, 16-036, and 16-035, p. 5-240 - Based on the response to the questions on DQO Step 6 and Description and History above, EPA may determine that additional samples will be required.
SWMU 13-004 has not been located with any certainty. Since the potential contamination at SWMUs 16-035 and 16-036 was likely to be polonium (with a half-life of 138 days), LANL requests that the number of samples remain at four for these SWMUs. Note that these samples are being analyzed for metals, uranium, SVOCS, asbestos, and HE - so other constituents will be found if they are present.

5.14 TA-11 Firing Site Aggregate, PRSs 11-001 (a,b), 11-002, 11-003(b), 11-004(a-f), 11-006(a-d), C-11-001, p. 5-242 -

60. 5.14.1.1 Description and History -

a. SWMU 11-001(a), p. 5-245 - What type of HE was used in experiments in the firing pit? LANL shall provide a better description of the activities which occurred at this unit.
Since this was a WWII site, the primary HE used would have likely been Comp B (TNT and RDX) and Baratol (TNT and barium nitrate). This firing pit was built in early 1945 and abandoned by early 1950. Memo 11-00002 (no author 1944) states that blast pressures of 7 000 psi (476 atm) could be expected against the nose cones of TA-11-2 and TA-11-3. The firing pit was built almost immediately after those buildings were

built. Given that they were abandoned within five years, it is likely that testing nose cones occurred only for a few years until they determined the optimum nose cone structure for the buildings. This information will be added to the text.

b. LANL shall provide a figure with more detail of the SWMUs, as Figure 5-49 is good for an overall picture, but does not have the detail required to examine SWMU size and locations.
LANL concurs. LANL will provide a more detailed map of K-Site as a new figure.

c. SWMU 11-001(b), p. 5-245 - What type of HE was used at this site?
Since this was a WWII site, the primary HE used would have been Comp B (TNT and RDX) and Baratol (TNT and barium nitrate). This information will be added to the text.

d. SWMU 11-004, p. 5-247 - What type of HE has been used at this SWMU?
Because this drop tower was constructed in 1956, the primary HE used would have been plastic-bonded explosives (containing primarily HMX, TNT, RDX, TATB). This information will be added to the text.

e. SWMU 11-002, p. 5-248 - Has this unit been used since 1992? Does the unit have interim status and will it receive a permit?
According to the current ESA-1 Group Leader, Paul Smith, the burn pit is currently used. The building manager of TA-11-24 states that the pit has been used in the last year or two and will be used extensively during the next three years. The pit is not used for waste disposal, rather it is an experimental unit - individual experiments are permitted by the state. Attachment F is the cover page of a recent permit application for a series of experimental tests to simulate transportation accidents involving fuel, high explosives, depleted uranium, and polyurethane.

61. 5.14.1.2.2 Potential Pathways and Exposure Routes,
p. 5-250 - What is the schedule for use of this site? What is the date for decommissioning this site? LANL shall submit work plans for the subsurface potential release sites within 90 days of receipt of this NOD. Based on the response to the above questions work on subsurface units may or may not be deferred until the site is decommissioned.
Per our discussion of August 8 1994, this site is used for experimental drops at most 4 times a year. The burn pit currently is used more often (36 burns scheduled for the next three years). LANL will submit sampling plans for these subsurface sites within 90 days. Per our discussion of August 8 1994, a single coring under the asphalt will be collected for each site.

62. 5.14.4.2 Sampling, p. 5-258 -

a. The drainage area from SWMU 11-006(c) should also be sampled and undergo analysis for the full suite of analytes.
LANL concurs. The majority of the area within the SWMU boundary is a cement trough that originally discharged 10 ft from the south drainage. However, this trough is breached 50 ft from the drainage, and an erosion channel has developed. LANL will take two 0 to 6 in. surface samples, one at the sediment trap beneath the trough breach, and one at the sediment trap 10 ft from the south drainage. These samples will be analyzed for the full suite of analyses.

b. North and South drainages - All the samples should be submitted for a full suite laboratory analysis not just the first and last.
LANL concurs. The DQOs and sampling plans will be updated to reflect this change.

5.15 TA-11 Outfalls Aggregate, SWMU 11-005(c), SWMUs 11-011(a-c)

63. 5.15.1.1 Description and History, p. 5-260 - LANL should provide the dates of operation for all these outfalls.
As stated in the work plan, all of the outfalls except SWMU 11-005(c) are still active. SWMU 11-005(c) was installed in 1944 to serve TA-11-2. A field visit in February 1992 showed that the drain for SWMU 11-005(c) had been plugged at an unknown date. TA-11-30 [associated with SWMU 11-011(b)] was built in 1959, the addition of TA-11-30A [associated with SWMU 11-011(c)] was built in 1956 according to the structure list. The text will be revised to incorporate this information.

64. 5.15.4.2 Sampling, p. 5-268 -

a. Outfalls on moderate slopes - LANL shall collect an additional sample for laboratory analysis 4-6 feet away from the outfall discharge point.
LANL concurs. An additional soil core will be taken 5 ft downgradient from the outfall. If there are more than 6 in. of sediment, then deep samples will be also be collected in each outfall for laboratory analysis. The surface samples will be analyzed for metals, SVOCs, and cyanide. The second sample (>6 in. taken at the soil-tuff interface) will be analyzed for metals, VOCs, SVOCs, and cyanide.

b. Paragraph four - Text indicates that two samples with the highest filed screening readings will be selected for laboratory analysis. This contradicts text in Design Criteria (DQO Step 6) on page 5-266 which indicates that "three samples per core will be submitted for full laboratory analysis". LANL should clarify what analysis will be conducted.
LANL concurs. LANL will clarify the text on p. 5-266 to indicate that field screening will be used to select two of the three core segments that will be submitted for laboratory analysis.

5.16 TA-11 Potential Surface Contamination Aggregate, SWMU 1-001(c), SWMU 11-012(a-d), C-11-002

65. 5.16.1.1 Description and History, C-11-002: TA-11-12, p. 5-274 - LANL shall provide additional information on this unit. Is it visible in any of the aerial photographs reviewed. Based on the information provided it should probably be included as a SWMU and be included in the permit.
TA-11-12 is present on the July 15, 1954 version of Engineering drawing R-128 and is listed as a laboratory building. It is shown on utility map R-646 dated July 30, 1958, but no utility lines are shown servicing this building. According to the structure list, it was a wooden frame building (7 ft wide x 9 ft long x 8 ft high) built in December 1944. It is not noted in 1983 or later drawings. TA-11-12 is visible on an oblique photograph of the airgun target range and appears to be a construction shack. It was removed to salvage in March 1959. Photos from March 11, 1958, indicate that TA-11-12 was located on a poorly maintained dirt road.

TA-11-5 was the other laboratory building at this site. TA-11-5 was built in 1944 and removed in 1956. TA-11-5 was 6 ft wide x 32 ft long x 8 ft high.
The CEARP report notes a 1950 memo that reported a chemistry building with "active" samples Ogle (1950, 15-11-011). This memo cannot refer to TA-11-12, since the memo refers to unsatisfactory hoods and poorly lit entrances and exits. TA-11-12 is too small to have multiple hoods and an entrance and exit door. This additional information will be added to the work plan. LANL contends that TA-11-12 was not a major laboratory facility, and should not be upgraded to a SWMU.

66. 5.16.4.2 Sampling, p. 5-278 -

a. LANL shall clarify the sampling procedures to be used. Will the entire 18 inches of core be analyzed as one sample. Why are 300 ml of core required?
LANL will analyze the entire 18-in. core segment, which will be collected using LANL-ER-SOP-06.10, R0. The reason for collecting an 18-in. segment is that these structures have been decommissioned and bulldozed, which will have redistributed PCOCs from the surface to a shallow depth. 300 ml is estimated to be an adequate volume of material for all required analyses. The investigation boundary on p. 5-277 will be updated to reflect this information.

b. For SWMU 11-001(c) which is a former burn pit, sampling should occur to 3 feet in depth. LANL shall take at least two samples per core.
LANL concurs. LANL will collect a 3-ft core segment or to the soil-tuff interface if it is shallower. The investigation boundary and the sampling plan for this unit will be updated.

5.17 Decommissioned Waste Storage Area, SWMU 16-013

67. 5.17.1.2.1 Nature and Extent of Contamination, p. 5-286 -LANL shall describe what is meant by the area has been cleaned. What does this include?
LANL concurs. LANL will include a brief description of the cleanup which included removing the empty boxes and cans.

68. 5.17.4.2 Sampling, p. 5-289 - Any areas of staining should be preferentially sampled. If no samples have a positive screening for PCOC's then LANL shall send 2 samples collected from obvious down gradient portions along the edge of the asphalt pad for laboratory analysis.
Based on a field visit, there is no staining visible in the north drainage. This information will be added to the text. There are two obvious downgradient sampling locations along the north end of the storage area. These locations are at the eastern sampling points on Figure 5-57. Samples submitted for laboratory analysis will be preferentially chosen from these locations in the absence of positive field screening.

69. 5.17.4.3 Laboratory Analysis, p. 5-291 - Why is LANL conducting laboratory analysis for VOCs when samples are being taken from the top 6 inches?
LANL concurs. LANL will remove VOC sampling from Table 5-78.

Chapter 6

70. Table 6-1, p. 6-1 - EPA does not necessarily agree with the criteria for no further action or deferred action. Each unit will be evaluated separately. Undergoing voluntary corrective action is not a reason for deferral.
LANL understands that the regulators review each site that LANL proposes for NFA or DA on a case-by-case basis. These criteria are used by LANL to create consistency within the ER Project and to facilitate review of these sites by EPA. We understand that new criteria are proposed for EPA consideration in a draft letter, dated June 24,1994, written in response to NOD comment 9 for the OU 1157 RFI Work Plan. OU 1082 has used the criteria that were current when each work plan was written.

71. 6.1.1.1.1 Background, p. 6-3 -

a. EPA does not approve deferral of any site which is beneath one of the open burn/detonation units (16-005(g)). These units must be sampled and a work plan submitted within 90 days detailing the sampling of these units. Removal of the interim status units which will receive a permit will be approved with concurrence of NMED.
Per our discussion of August 8 1994, LANL will take one angled boring beneath the active open burn unit. A sampling plan for this unit will be provided within 90 days. The closure plan for the TA-16 open burn units that was requested in the August 8 conference call is presented in Attachment G.

b. SWMU 16-010(d), p. 6-4 - Has this unit also been converted to a burn table and is it currently active?
This burn slab has been converted to a burn table, and the text will be clarified to reflect this change.

72. 6.1.2.1.2 Rationale for Recommendation, Inactive Surface Impoundment. p. 6-7 - Has NMED approved the actual closure of this unit? With concurrence from NMED, LANL may request removal from the permit via a Class 3 permit modification.
NMED has recently approved the closure of this unit (SWMU 16-008(b) the hypalon pond), and a copy of this letter (dated June 7, 1994) has been attached to this response (Attachment H). The text will be modified to reflect this information.

73. 6.1.3.1.1 Background, SWMU 16-010(g) - LANL may request removal of this unit from the permit by a Class 3 permit modification. If this unit did not handle or manage solid waste then it should not be listed as a SWMU.

With approval from NMED, LANL may request removal of the following units by a Class 3 modification from the HSWA portion of the permit:

16-012 (d,i,j,l,m,n,t,u,x)
16-012(p)
16-012(a2)
11-011(c)
16-006(f)
LANL will include these units in the next Class 3 permit modification. Approval from NMED will also be requested.

74. MDA P - NMED has the lead for this unit and all activities should be covered under closure requirements. LANL may request removal of this unit from the HSWA portion of the RCRA permit by a Class 3 permit modification.
This unit is currently undergoing regulatory approval. LANL will include this unit in a future Class 3 permit modification with approval from NMED. LANL recently submitted a revised closure plan for this unit. NMED issued an NOD on the initial plan and LANL is currently responding.

75. 6.1.5.1.3 Rationale for Recommendation, SWMU 11-007
p. 6-14 - The reason to recommend this unit for no further action should be that it does not meet the definition of a SWMU. LANL may request removal of this unit from the permit by a Class 3 permit modification.
LANL concurs. The text will be modified to indicate that the unit does not meet the definition of a SWMU. LANL will include this unit in the next Class 3 permit modification.

76. 6.1.5.2 MDA S, SWMU 11-009, p. 6-14 - What procedures are in place to ensure there will be no release of materials from this SWMU. If the SWMU is defined by the area of the fence then investigation of this site may be deferred until completion of the experiment.
The buffer zone around the experimental pots ensures that no release from the unit, which is defined by the fence, will occur.

77. 6.1.5.3.1 SWMU 16-005(n), p. 6-16 - Archival information does not appear sufficient to no further action this SWMU. This unit should be investigated and a sampling plan should be submitted within 90 days.
Per our discussion of August 8 1994, LANL will submit a sampling plan to collect a sludge sample from this tank within 90 days.

78. 6.1.5.4.1 SWMU 16-005(o), p. 6-17 - Was there ever any other use for building TA-16-101 other than a guard house? If this unit only served a guard house then EPA concurs that no further action is required.
There was never any use for TA-16-101 other than a guard house, and the text will be rewritten to indicate this fact. LANL will include this unit in a future Class 3 permit modification. Approval from NMED will also be requested.

79. 6.1.5.5.2 Recommendation SWMU 16-006(b), p. 6-18 - Why is this listed as an active septic system when the guard house it serves is inactive? LANL may request removal of this unit from the permit.
The guard house is used periodically as an alternate access point for construction equipment. LANL will include this unit in a future Class 3 permit modification. Approval from NMED will also be requested.

80. 6.1.5.7 Rest Houses SWMUs 16-012 (a-z) and 11-010(a),
p. 6-19 - What is the function of the drains associated with the rest houses? Why do the drains lead to high-explosive sumps if there is no problem with the handling of HE at these sites. LANL needs to provide additional information prior to consideration of no further action by EPA. Figures should be provided.
Per our discussion of August 8 1994, LANL will provide a better description of these rest houses in support of the NFA proposal rather than provide figures. Of the SWMUs

listed, only SWMUs 16-012(k,r,s) have exterior drains, and the sumps associated with these SWMUs will be sampled as described in aggregate 5.2 of this work plan.

81. The following units do not need to be added to the permit:

SWMU 16-007(b)
SWMU 11-003(a)
SWMU 11-008
SWMU 11-010(b)
SWMU 37-001
C-11-003

LANL concurs.