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U. S. Department of Energy
 Los Alamos Area Office, MS A316
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 Los Alamos, New Mexico 87544
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Date: May 2, 1997
 Refer to: EM/ER:97-145

Mr. Benito Garcia
 NMED-HRMB
 P.O. Box 26110
 Santa Fe, NM 87502

SUBJECT: RESPONSE TO THE NOD FOR RFI REPORT FOR PRSs IN TAs-18 AND 27, (FORMER OPERABLE UNIT 1093)

Dear Mr. Garcia:

Enclosed is a copy of the Los Alamos National Laboratory's response to the New Mexico Environment Department's Notice of Deficiency (NOD) concerning the Resource Conservation and Recovery Act Facility Investigation Report for potential release sites in Technical Areas 18 and 27. A certification form signed by the appropriate officials is also enclosed. The enclosed response repeats each comment verbatim from the NOD for convenience in reviewing.

Please contact Gene Gould at (505) 667-0402 or Mike Gilgosh at (505) 667-5794, if you have any questions regarding the response to the NOD.

Sincerely,

Jorg Jansen, Program Manager
 LANL/ER Project

Sincerely,

Theodore J. Taylor, Program Manager
 DOE/LAO

JJ/TT/ss

- Enclosures: (1) Response to the NOD for RFI Report in TAs-18, 27 (Former Operable Unit 1093)
 (2) Certification

TZ



Cy (w/ encs.):

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N. Naraine, DOE-HQ, EM-453
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CERTIFICATION

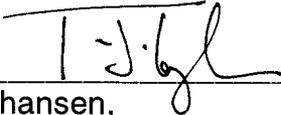
I certify under penalty of law that these documents and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage 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 the NOD for RFI Report in TAs-18, 27 (Former OU 1093)

Name:  Date: 5-2-97
Jorg Jansen, Program Manager
Environmental Restoration Project
Los Alamos National Laboratory

or

Tom Baca, Program Director
Environmental Management
Los Alamos National Laboratory

Name:  Date: 5/2/97
Mathew Johansen,
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Environment Restoration Program
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**RESPONSE TO NOD FOR
RFI REPORT FOR POTENTIAL RELEASE SITES IN
TECHNICAL AREAS 18 AND 27**

INTRODUCTION

The Los Alamos National Laboratory has reviewed the subject Notice of Deficiency (NOD), and has prepared the attached responses to the comments presented in the NOD.

In the process of preparing the responses, Laboratory representatives met with Ms Kim Hill, of the New Mexico HRMB, on April 21, 1997. The meeting was very helpful for clarifying some comments.

The subject RFI Report was submitted in November 1995, during a time when the format for RFI Reports was in transition. As indicated by many of our responses, the Laboratory recognizes and will abide by agreements made with HRMB to update information and analysis presented in the report so as to be consistent with the format in our current RFI Framework Policy; particularly with regard to applying screening action levels and site-wide background values that have been revised since this RFI report was submitted.

The attached response provides specific replies, and we believe resolves, a large number of issues raised by the NOD. However, a number of items such as those described above will require additional time to prepare a complete response. We have proposed a date of July 15, 1997 for the submission of a response that will address the outstanding issues.

The Laboratory acknowledges that RFI data indicate the presence of potential contaminants in shallow groundwater at TA-18. However, these data do not support the assertion made in your letter of February 24 that significant and systemic ground water contamination exists in the shallow aquifer. Further investigation of groundwater to resolve this issue is proposed in this response. Additional related groundwater investigations are proposed in the Hydrogeologic Work Plan, submitted to HRMB in December 1996.

**RESPONSE TO ATTACHMENT A (SUMMARY OF CONCLUSIONS) OF NOD FOR
RFI REPORT FOR POTENTIAL RELEASE SITES IN TECHNICAL AREAS 18 AND 27**

The following table summarizes the detailed responses provided in LANL's response to Attachment B.

PRS	LANL's PROPOSED ACTION	DOES HRMB CONCUR	HRMB's RATIONALE	LANL's RESPONSE
18-002(a)	NFA	No	Discreet samples not obtained; holding times exceeded for contaminants of concern; additional information sampling required.	Composite samples were proposed in the approved RFI work plan. Statistical evaluation of results support use of composite samples. Effect of exceeding holding times will be documented. Additional groundwater sampling proposed to support NFA.
18-002(b)	NFA	No	Discreet samples not obtained; holding times exceeded contaminants of concern; additional information sampling required.	Composite samples were proposed in the approved RFI work plan. Statistical evaluation of results support use of composite samples. Effect of exceeding holding times will be documented. Additional groundwater sampling proposed to support NFA.
18-002(c)	NFA	No	Discreet samples not obtained; holding times exceeded for contaminants of concern.	Composite samples were proposed in the approved RFI work plan. Statistical evaluation of results support use of composite samples. Effect of exceeding holding times will be documented. Additional groundwater sampling proposed to support NFA.
18-003(a)	AC	No	Contaminants of potential concern (COPCs) > Screening Action Levels (SAL)s; no baseline risk assessment conducted; additional information/sampling required.	COPCs detected in contents of settling pit. Interim action conducted to empty tank in summer 1996. Additional TA-18-wide groundwater sampling proposed to support NFA proposal.
18-003(b)	AC	No	COPCs > SALs; no baseline risk assessment conducted; additional information/sampling required.	COPCs>SAL will be compared to industrial PRGs.. Interim action conducted to empty tank in summer 1996. Additional TA-18-wide ground water sampling proposed to support NFA proposal.

NFA - no further action.

AC - accelerated cleanup.

PRS	LANL's PROPOSED ACTION	DOES HRMB CONCUR	HRMB's RATIONALE	LANL's RESPONSE
18-003(c)	AC	No	COPCs > SALs; no baseline risk assessment conducted; additional information/sampling required.	COPCs>SAL will be compared to industrial PRGs. Interim action conducted to empty tank in summer 1996. Additional TA-18-wide groundwater sampling proposed to support NFA proposal.
18-003(d)	AC	No	COPCs > SALs; no baseline risk assessment conducted; additional information/sampling required.	COPCs detected in contents of septic tank. Interim action conducted to empty tank in summer 1996. Additional TA-18-wide groundwater sampling proposed to support NFA proposal. Corrective action initiated in December 1996 to address nature and extent of groundwater contamination.
18-003(e)	NA	NA	Not applicable: accelerated cleanup performed August 1995.	Expedited cleanup performed August 1995.
18-003(f)	NFA	No	COPCs > SALs; no baseline risk assessment conducted; additional information required.	COPCs>SAL compared with industrial PRG. Risk acceptable. Existing data support NFA proposal
18-003(g)	AC	No	COPCs > SALs; no baseline risk assessment conducted; additional information/sampling required.	COPCs detected in septic tank. Interim action conducted to empty tank in summer 1996. Additional TA-18-wide groundwater sampling proposed to support NFA proposal
18-003(h)	NFA	No	Site inadequately characterized.	No COPCs detected in tank; no basis for additional sampling. Existing data support NFA proposal.
18-004(a)	NFA	No	Additional information/sampling required.	No media to sample in accessible portion of pipe; sampling will be deferred until site decommissioning.
18-004(b)	NFA	No	Site inadequately characterized; additional information/sampling required.	PRS could not be located for sampling without excavation, which is not possible for operational/security reasons. Sampling will be deferred until site decommissioning.
18-005(a)	NFA	No	Additional information/sampling required.	Sampling conducted in accordance with approved RFI work plan at locations that characterize site. Data adequate to support NFA proposal.

NFA - no further action.

AC - accelerated cleanup.

PRS	LANL's PROPOSED ACTION	DOES HRMB CONCUR	HRMB's RATIONALE	LANL's RESPONSE
18-008	NFA	No	NFA proposed based on PRS not located; PRS recently located.	PRS located after RFI report was submitted. Site remediated in accordance with UST requirements. NFA justified.
18-010(b)	NFA	No	Additional information/sampling required	Sampling conducted in accordance with approved RFI work plan. Documentation for elimination of COPCs supplied in this response. Existing data support NFA proposal.
18-010(c)	NFA	No	Additional information/sampling required.	Sampling conducted in accordance with approved RFI work plan. Documentation for elimination of COPCs supplied in this response. Existing data support NFA proposal.
18-010(d)	NFA	No	PAHs > SALs	Sampling conducted in accordance with approved RFI work plan. Documentation for elimination of COPCs supplied in this response. Existing data support NFA proposal.
18-010(e)	NFA	No	PAHs > SALs	Sampling conducted in accordance with approved RFI work plan. Documentation for elimination of COPCs supplied in this response. Existing data support NFA proposal.
18-010(f)	NFA	No	Additional information/sampling required.	Sampling conducted in accordance with approved RFI work plan. Documentation for elimination of COPCs supplied in this response. Existing data support NFA proposal.
18-011	NFA	No	Additional information/sampling required.	Sampling conducted in accordance with approved RFI work plan. This response clarifies sampling locations. Existing data support NFA proposal.
18-012(a)	NFA	No	Additional information/sampling required.	Sampling conducted in accordance with approved RFI work plan. Clarification of basis for elimination of COPCs supplied in this response. Existing data support NFA proposal.

NFA - no further action.

PRS	LANL's PROPOSED ACTION	DOES HRMB CONCUR	HRMB's RATIONALE	LANL's RESPONSE
18-012(b)	NFA	No	PAHs > SALs; additional information/sampling required.	Sampling conducted in accordance with approved RFI work plan. Inorganic COPCs>SAL compared with industrial PRGs; risk acceptable. Documentation for elimination of organic COPCs supplied in this response. Existing data support NFA proposal.
18-012(c)	NFA	No	Site inadequately characterized; additional information/sampling required.	Sample locations adequately characterize site. Existing data support NFA proposal.
18-013	NFA	No	COPCs > SALs; used industrial PRGs as SALs; no baseline risk assessment conducted.	COPCs>SAL (based on Subpart S) compared with industrial PRGs; risk acceptable. Existing data support NFA proposal.
27-002	NFA	No	Discreet samples not obtained; holding times exceeded contaminants of concern; additional information/sampling required.	Composite samples were proposed in the approved RFI work plan. Statistical evaluation of results support use of composite samples. Effect of exceeding holding times will be documented. Additional groundwater sampling proposed to support NFA.

NFA - no further action.

**RESPONSE TO ATTACHMENT B (NOTICE OF DEFICIENCY COMMENTS) OF
NOD FOR RFI REPORT FOR POTENTIAL RELEASE SITES
IN TECHNICAL AREAS 18 AND 27**

1. GENERAL COMMENTS

1.a Approach/Conceptual Model

Comment 1.a.i. *LANL shall treat Potential Release Sites (PRSs) within close proximity of one another and affecting the same media as non-isolated units. For instance, information gathered for one PRS should be used in the assessment of other nearby PRSs. [Concept similar to collective drainage approach]*

LANL Response:

A meeting held with HRMB on April 21 clarified that the comment requests aggregation of data from proximate PRSs that have a potential for affecting the same media. LANL believes this concept can be applied to two situations within TA-18—outfalls that discharge near or into the stream channel in Pajarito or Threemile canyons and the combined effects of all PRSs on groundwater quality in the shallow alluvial aquifer within and down-gradient from TA-18.

The combined effects of outfall discharges were explicitly addressed through the collection of multiple sediment samples down-gradient from the eastern-most outfall at TA-18—PRS 18-003(e). The data for these samples were presented in the RFI report, but there was no explicit discussion of the implications of the data regarding combined effects. That discussion will be added to Section 4.4.3.4, Data Interpretation, for that PRS.

Modified text will be submitted to HRMB by July 15, 1997.

The combined effects of multiple PRSs on groundwater are addressed in the response to Comment 1.a.ii.

Comment 1.a.ii. *NMED has a regulatory interest not only in the PRSs themselves, but also in any ground water contamination beneath them. This RCRA Facility Investigation (RFI) report recommends no further action for many PRSs based on the observation that the PRS being investigated is not the source of identified contaminant concentrations in ground water. New Mexico Environment Department (NMED) cannot support the No Further Action (NFA) recommendation proposed for these sites without adequate commitment from LANL to assess the cumulative risk to ground water.*

LANL Response:

The groundwater characterization to date in the area addressed by the RFI report for former OU 1093 has been in accordance with that proposed in the approved RFI work plan. LANL acknowledges that data resulting from the RFI indicates the presence of some contaminants at levels above the respective MCL, and in one instance [PRS 18-003(d)] above the New Mexico Water Quality Commission standards for groundwater. LANL has implemented a corrective action at PRS 18-003(d) to better define the nature and extent of contamination. The RFI data also indicate the presence of high explosive (HE) constituents in groundwater or springs upgradient from TA-18. HE constituents were detected in groundwater within and down-gradient from TA-18 and in water samples from wetland areas within and down-gradient from TA-18. The reported concentrations are significantly below the screening action levels (SALs) in use when the RFI report was prepared. The significance of the reported HE concentrations will be re-evaluated as part of summarizing the effect of replacing previous SALs with EPA Region 9 preliminary

remedial goals (PRG) and applicable water quality standards. LANL believes that existing groundwater data do not support the HRMB conclusion, as presented in the transmittal letter for the NOD, that "significant and systemic groundwater contamination exists in the shallow alluvial groundwater."

However, as noted previously, the existing data do indicate the presence of low concentrations of potential contaminants and are not sufficient to establish the source of these constituents. The Hydrogeologic Workplan (LANL 1996, 1378) proposes the construction and sampling of nine alluvial wells and one piezometer transect upgradient from, within, and down-gradient from TA-18 in Pajarito and Threemile canyons. The general objectives of these wells, as described in Section 4.3.2.4 of the Hydrogeologic Workplan, is to determine the nature and extent of contaminants in the alluvial groundwater in Pajarito and Threemile canyons and to obtain information related to water budget and recharge to deeper aquifers. There was no schedule provided in the Hydrogeologic Workplan for construction of these wells. In order to address HRMB's concerns regarding the nature and extent of groundwater contamination within former OU 1093, LANL proposes to construct and sample these wells as soon as agreement can be reached with HRMB regarding the proposed location and purpose of each well. LANL will write a sampling plan, which will include data quality objectives for these wells and additional sampling, such from as stream sediments, surface water or springs. LANL believes these wells and associated sampling will provide the data required to augment the general understanding of the source of contaminants and potential contaminants upgradient from and within TA-18.

A detailed sampling plan will be submitted to HRMB by July 15, 1997.

Reference:

LANL (Los Alamos National Laboratory), December 6, 1996. "Hydrogeologic Workplan," Revision 1.0, Los Alamos National Laboratory Report, ER ID No. 55430, Los Alamos, New Mexico. (LANL 1996, 1378)

Comment 1.a.iii. *LANL must determine the source and extent of contamination for those PRSs whose analytical results exceeded background and Screening Action Levels (SALs). The New Mexico Water Quality Control Commission (WQCC) regulations, among others focus on presence of contaminants rather than on specific PRSs. Under these regulations, LANL has the responsibility to investigate further to ensure that no other areas of significant contaminant concentrations exist.*

CONTAMINANTS EXCEEDING BACKGROUND AND SALs	PRSs ADDRESSED IN THIS RFI REPORT
<i>High Explosives</i>	2(a)
<i>Inorganics</i>	3(a-c, f),
<i>Organics</i>	3(a-c, d, g), 10(d-e), 12(b-c), 13
<i>COPCs < SALs based on this RFI</i>	HSWA: 2(b-c), 3(h), 4(a), 5(a), 27-002 NON-HSWA: 4(b), 8, 10(b-c, f), 11, 12(a)

LANL Response:

LANL will replace the SAL values used in this report for evaluation of groundwater quality with water quality standards, where applicable, including those promulgated by the New Mexico Water Quality Commission (see response to Comment 1.a.v). The summary of the changes, if any, resulting from the use of new SAL values will be evaluated.

Additional proposed investigation of the alluvial groundwater will provide information regarding the extent of any groundwater contamination in the area addressed by this RFI report (see response to Comment 1.a.ii).

LANL believes that concurrence must be reached with HRMB, the NMED Ground Water Quality Bureau, and LANL as to the extent of any investigations required by the New Mexico Water Quality Commission regulations.

Comment 1.a.iv. *LANL shall recalculate upper tolerance limits based on the 95th confidence level of the 95th percentile of distribution. LANL shall respond to this comment by providing a summary of the newly calculated Upper Tolerance Limits (UTLs), the former UTLs, and any effects it has on the data comparisons made in this report.*

LANL Response:

The background UTLs have been recalculated based on the 95% upper confidence limit of the 95th percentile of the distribution (Ryti et al. 1996, 1298). A summary table presenting the current and former background UTLs as well as any effect the current UTLs may have had on the data comparisons will be provided. In addition, replacement of the estimated site-specific background values with the current site-wide background values will be evaluated and included in this summary. Similar comparisons and effects summaries will be done by replacing the site-specific sediment values with the current site-wide sediment UTLs. Replacement of soil background UTLs with site-wide sediment UTLs will also be done, where appropriate, because sediment UTLs were not available at the time this RFI report was written. Background comparisons using the current UTLs will not be done with the sludge or liquid samples from the septic tanks as such comparisons are not appropriate for waste materials.

The summary table evaluating the effects of using the new UTLs will be submitted to HRMB by July 15, 1997.

Reference:

Ryti, R., P. Longmire, and E. McDonald, March 29, 1996. "Application of LANL Background Data to ER Project Decision-Making, Part I: Inorganics," Los Alamos National Laboratory Report LA-UR-96-1534, Los Alamos, New Mexico. (Ryti et al. 1996, 1298)

Comment 1.a.v. *LANL shall clarify which land use scenarios were used to generate SALs for each of the Multiple Chemical Evaluations (MCEs) performed in this report. LANL shall base its SALs on US Environmental Protection Agency (USEPA) Region IX residential Potential Remediation Goals (PRGs). LANL may, in addition to performing the MCE based on residential risk, present an evaluation of risk based on a most likely exposure scenario. In response to this Notice of Deficiency (NOD) comment, LANL shall submit a table of revised SALs, SALs applied in the RFI report, and discuss any resulting differences which may affect the decisions made in this RFI report. For those SALs absent from the USEPA Region IX PRGs, LANL shall calculate the SAL using Subpart S guidance. LANL shall provide an explanation of the methodology and the calculations used to derive the SALs.*

LANL Response:

The soil screening action levels (SALs) for non-radiological chemicals currently in use are based on the EPA Region 9 preliminary remediation goals (PRGs) for residential soil (EPA 1996, 1351). These replace SALs in use when the RFI report was prepared that were based on methodology presented in Subpart S of 40 CFR 264. It should be noted that under the current approach, there are no screening values for water that are explicitly equal to EPA Region IX PRGs. Instead, reported constituent concentrations in water will be compared to the appropriate and/or applicable water quality standard(s) for a given analyte.

The Region 9 PRGs are derived by incorporating current EPA toxicity values [i.e., reference doses (RfDs) and carcinogenic slope factors] from the IRIS (EPA 1994, 1167) or HEAST (Miller 1994, 1169) databases

as well as from EPA's National Center for Environmental Assessment with standard exposure parameters to estimate contaminant concentrations in environmental media that are protective of humans over a lifetime. The PRGs correspond to a fixed level of risk (10^{-6}) for carcinogens and a non-carcinogenic hazard quotient of one. For those chemicals for which Region 9 PRGs are not available, SALs will be calculated using the methodology in EPA's "Corrective Action for Solid Waste Management Units," Subpart S (EPA 1990, 0432) provided that sufficient, adequate, and approved toxicity data are available to calculate RfDs or cancer slope factors. For those chemicals that do not have sufficient, adequate, and approved toxicity data to calculate an RfD or cancer slope factor, a surrogate will be used to obtain a SAL, based on similarity in structure and/or toxicology. For example, phenanthrene has no SAL available, but because it is similar in structure to pyrene, the SAL for pyrene will be used in the data comparison for phenanthrene. SALs are updated annually as new toxicity information and/or applicable or relevant and appropriate requirements (ARARs) become available.

A summary table comparing old SALs (those in the RFI report) and new SALs (Region 9 residential PRGs) and others as described previously for soils at each PRS will be provided along with a discussion as to changes in the data comparison and conclusions. A summary table comparing groundwater data to the old SALs and the most recent applicable and appropriate water quality standards (New Mexico or federal) will also be provided along with a discussion of changes in the conclusions. Septic tank contents will not be included in the summary because comparison of constituent concentrations in waste (septic tank sludge and water) to SALs or water quality standards is not appropriate.

The summary table described above will be submitted to HRMB by July 15, 1997.

References:

EPA (US Environmental Protection Agency), August 1, 1996. "Region 9 Preliminary Remediation Goals (PRGs), 1996," San Francisco, California. (EPA 1996, 1351)

EPA (US Environmental Protection Agency), May 1994. "Integrated Risk Information System (IRIS)," Office of Science and Technology, National Technical Information Service, Springfield, Virginia. (EPA 1994, 1167)

EPA (US Environmental Protection Agency), July 27, 1990. "Corrective Action for Solid Waste Management Units (SWMUs) at Hazardous Waste Management Facilities," proposed rule, Title 40, Parts 264, 265, 270, and 271, Federal Register, Vol. 55., pp. 30798-30884 (EPA 1990, 0432)

Miller, I. C., March 1994. "Health Effects Assessment Summary Tables Annual Update, FY-1994," 9200.6-303(94-1), EPA 540-R-94-020, prepared by Oak Ridge National Laboratory for the Environmental Protection Agency, Oak Ridge, Tennessee. (Miller 1994, 1169)

Comment 1.a.vi. *LANL must perform a baseline risk assessment (BRA) for those PRSs where contaminant concentrations exceed SALs. The potential for human health or ecological risk due to additive inputs from multiple, nearby sources should be considered; many sites within TA18 may present carcinogenic, non-carcinogenic, or radiological risks which, in total, may present an unacceptable human health or ecological risk. Consideration should be given to whether additive effects will be sufficiently evaluated either within an ecological risk assessment or within the Watershed Management Plan, or by some other means. See comment 1. a.iii above.*

LANL Response:

The stated objectives of the RFI were to determine the presence or absence of contamination at each PRS under investigation, and if contaminants were detected, to evaluate the need for further investigation

or remediation. Sampling locations were selected to present a high probability of detecting the maximum concentration of potential contaminants. No baseline risk assessment was planned or conducted using the Phase I RFI data. For all sites where reported concentrations of potential contaminants were above the respective SALs, the maximum concentrations were compared with a preliminary remedial goal based on industrial land use. These comparisons were made in lieu of a baseline risk assessment. For all PRSs within former OU 1093, these comparisons indicated that the maximum risk was in the range of 10^{-4} to 10^{-6} and the hazard ratio was less than 1.0. However, these comparisons used previously calculated SALs and PRGs. LANL will re-evaluate these conclusions using Region 9 residential PRGs in place of SALs and Region 9 industrial PRGs in place of the former calculated values. (See response to Comment 1.a.v.) LANL believes that this approach satisfies the need to assess the human health risk associated with each individual PRS.

Ecological risk was evaluated for individual sites using the methodology existing when the RFI report was prepared. However, LANL has developed an eco-risk screening methodology that considers the effect of multiple sites over a habitat range. That will be applied to the PRSs addressed by the RFI report for former OU 1093.

The results of the eco-risk screening will be reported in an addendum to the 1093 RFI Report by September 30, 1997.

Comment 1.a.vii. *LANL obtained unfiltered inorganic ground water samples for this RFI report using the procedures set out in Section 3.2.2 Comparison with Screening Action/Other Standards*

"For surface water or groundwater, the SALs are based on regulatory levels...The SALs for surface water and groundwater are maximum contaminant levels (MCL) promulgated under the Safe Drinking Water Act...the State of New Mexico Water quality regulations (which take precedence over the Clean Water Act) stipulate that filtered samples shall be used for the comparison of inorganic concentrations against state water quality standards. In accordance with this, only the organic results from filtered samples were used in the SAL comparison for surface water and groundwater samples."

Because these samples were unfiltered, the concentrations of contaminants were deemed "NC" or not comparable with the New Mexico WQCC standards. LANL, however, did not continue the evaluation by comparing the concentrations with any other standard applicable to unfiltered samples, such as the Safe Drinking Water Act's (SDWA) Maximum Contaminant Levels (MCLs). LANL must, at a minimum, compare the unfiltered samples to SDWA MCLs and Region IX PRGs.

LANL Response:

The intent of the Safe Water Drinking Act (SDWA) is to test the quality of treated drinking water for public consumption. Because the treated drinking water undergoes filtration before distribution to the public, filtration of samples for inorganic analysis should be done unless the water samples are collected at the point of distribution. The water samples collected from wells at TA-18 were not from the point of distribution so that the comparison of the non-filtered samples to inorganic maximum contaminant levels (MCLs) under the SDWA is inappropriate. However, for information purposes, the inorganic results of the non-filtered samples will be compared to SDWA MCLs and Region 9 PRGs for tap water and provided in a summary table as requested. This information will be included in the summary table described in the response to Comment 1.a.v.

Comment 1.a.viii. *This RFI report does not include an assessment of ecological risk. An evaluation of risk posed to ecological receptors must be assessed prior to recommending No Further Action (NFA) for a PRS.*

LANL Response:

See response to Comment 1.a.vi.

1.b Supporting Documentation

Comment 1.b.i. *LANL shall include pertinent information such as a tabulated summary of Photo ionization Detector Flame ionization Detector (PID/FID) readings, auger logs, boring logs, well construction diagrams, well development methodology, and log books in the RFI report.*

LANL Response:

Documentation provided with the RFI report is generally consistent with that specified in the approved RFI report framework policy. LANL will provide copies of boring logs and well construction details for all monitoring wells placed as part of the RFI. Boring logs were not recorded for other auger holes. LANL will provide copies of the field log book entries made during the RFI. Copies of the boring logs and logbooks will be provided to HRMB by July 15, 1997.

At PRSs 18-003(a, b, c, and d), PID/FID readings were used to determine whether or not VOC analyses should be performed. In the response to Comment 1.c.iii, LANL acknowledges HRMB's position that such use of the PID data is inappropriate; the media in the tanks was subsequently analyzed for VOCs and SVOCs. At PRS 18-004(a), a PID was used to determine if any organic vapors could be detected in the pipe. None were detected, but no sampling decisions were based on the readings; there was no media to sample. With these exceptions, PID/FID were used exclusively to ensure appropriate industrial hygiene protection of site workers. With the noted exceptions, these data were not used for making sampling decisions or as any evidence of the presence or absence of contamination. Readings are often not associated with a particular sample—such as a PID reading in the breathing zone of a site worker during augering. Nearly all readings during the RFI were at or only slightly above ambient readings; in no instance was an upgrade in personnel protective equipment required by elevated PID/FID readings. Because the PID/FID data are not considered pertinent to site characterization, these data were not uploaded to FIMAD. The data exist exclusively in field log books. A substantial effort would be involved in tabulating these data from the log books. For these reasons, LANL believes that tabulation of the PID data as part of the RFI report for OU 1093 is not warranted.

Comment 1.b.ii. *LANL shall provide a checkplot presenting a compilation of all the sampling locations (including site-specific background sampling locations) and additional information including, but not limited to, the following:*

- *all springs, wells, and seeps within the same canyon system(s) or within a 1-mile radius of any PRS within the RFI;*
- *all contaminant concentrations greater than background, greater than SALs, and greater than SALs and less than USEPA Region IX PRGs;*
- *types of analyses conducted at each location;*
- *exposure scenario for the PRG standards; and*
- *site-specific background concentrations.*

LANL Response:

A meeting held on April 21 clarified that HRMB desires one or more maps, at a scale smaller than the figures used in the RFI report, to present an overview of the sampling results. LANL will review the capabilities of FIMAD to produce such maps and will present a proposal to HRMB. If a mutually acceptable (to LANL and HRMB) format for the summary maps can be defined the requested maps will be submitted to HRMB by July 15, 1997.

Comment 1.b.iii. *LANL shall provide a checkplot and table summarizing all the site-wide background sampling locations and results.*

LANL Response:

Site-wide background sampling is addressed in the publication Natural Background Geochemistry and Statistical Analysis of Selected Soil Profiles, Sediments, and Bandelier Tuff (Longmire et al 1995, 1266). LANL has provided NMED with a copy of this document. Representation of the results for all analytes for all sites on a single map is, at best, cumbersome. LANL will discuss the available options with FIMAD for presenting summaries of the background data and present options to HRMB. If a mutually acceptable (to LANL and HRMB) format for the summary map can be defined, the summary map will be submitted to HRMB by July 15, 1997.

Reference:

Longmire, P. A., D. E. Broxton, and S. L. Reneau (Eds.), October 1995. "Natural Background Geochemistry and Statistical Analysis of Selected Soil Profiles, Sediments, and Bandelier Tuff, Los Alamos, New Mexico," Los Alamos National Laboratory Report LA-UR-95-3486, Los Alamos, New Mexico. (Longmire et al. 1995, 1266)

Comment 1.b.iv. *LANL shall provide supporting documentation in defense of eliminating Contaminants of Potential Concern (COPCs) attributed to sources (asphalt paving, etc.) other than site activities or eliminated using "process information" or other such "knowledge" such as 18-010(b).*

LANL Response:

In general, polycyclic aromatic hydrocarbons (PAHs), the group to which benzo(a)pyrene, benzo(b)fluoranthene, chrysene, pyrene, etc. belongs, have been sporadically detected at many PRSs throughout the Laboratory. There is typically no specific source of PAHs attributable to the process activities at these PRSs. It has been found that PAHs are associated with asphalt runoff (e.g., paved areas and roofs) as well as from incomplete combustion (e.g., incinerators, forest fires, or vehicle exhaust) (Clement International Corporation 1993, ER ID No. 55663; Bradley et al. 1994, 1144; Menzie et al. 1992, ER ID No. 55635; Butler et al. 1984, ER ID No. 55634; Edwards 1983, ER ID No. 55636). In most cases, these chemicals are detected in areas influenced by these types of non-PRS-related sources, e.g., stormwater outfalls, ditches next or near paved driveways or roads, etc. The PAHs are eliminated, in many cases, based on available site information, because only those chemicals believed or suspected of being associated with a release from a PRS as a result of site activities are retained and subjected to the screening assessment process.

For other chemicals, available process information was based on the RFI work plan, conversations with site personnel, and a chemical inventory maintained by LANL that lists the hazardous chemicals used or stored at TA-18.

This issue is discussed further in responses to comments addressing specific PRSs.

References:

Bradley, L. J. N., B. H. Magee, and S. L. Allen, 1994. "Background Levels of Polycyclic Aromatic Hydrocarbons (PAH) and Selected Metals in New England Urban Soils," in *Journal of Soil Contamination*, Vol. 3(4), p. 349. (Bradley et al. 1994, 1144)

Butler, J. D., V. Butterworth, S. C. Kellow, and H. G. Robinson, 1984. "Some Observations of the Polycyclic Aromatic Hydrocarbon (PAH) Content of Surface Soils in Urban Areas," *The Science of the Total Environment*, ER ID No. 55634, Vol. 33, pp. 75-85. (Butler et al. 1984, ER ID No. 55634)

Clement International Corporation, August 1995. "Toxicological Profile for Polycyclic Aromatic Hydrocarbons," prepared under Contract No. 205-88-0608 for Agency for Toxic Substances and Disease Registry, ER ID No. 55663, US Public Health Service, Washington, DC. (Clement International Corporation 1990, ER ID No. 55663)

Edwards, N. T., 1983. "Polycyclic Aromatic Hydrocarbons (PAHs) in the Terrestrial Environment — A Review," *Journal of Environmental Quality*, ER ID No. 55636, Vol. 12, No. 4, pp. 427-441. (Edwards 1983, ER ID No. 55636)

Menzie, C.A., B. B. Potocki, and J. Santodonato, 1992. "Exposure to Carcinogenic PAHs in the Environment," *Environmental Science and Technology*, ER ID No. 55635, Vol. 26, No. 7, pp. 1278-1284. (Menzi et al. 1992, ER ID No. 55635)

Comment 1.b.v. *LANL shall present a complete view of the site including site history, process knowledge, site conditions such as improvements, etc. within the RFI report so that it can be presented as a "stand-alone" document.*

LANL Response:

It is LANL's position that some reference to the RFI work plan is unavoidable for a thorough understanding of the RFI report. The current approved RFI report framework policy, "Resource Conservation and Recovery Act Facility Investigation (RFI) Report Framework Policy," EM/ER:96-PCT-014, dated August 19, 1996 (Project Consistency Team, 1210), contains numerous references to the RFI work plan for additional detail. However, the RFI report for former OU 1093 was prepared before that framework was approved and may not contain an appropriate level of detail with regard to site history and processes that may have created contamination. LANL will review the RFI report and provide amended text, as appropriate, for the section presenting the history of each PRS.

The amended text will be supplied to HRMB by July 15, 1997.

Reference:

Project Consistency Team. "Project Consistency Team (PCT) Policy Memo Notebook," (Controlled), Environmental Restoration Project, Los Alamos National Laboratory, Los Alamos, New Mexico. (Project Consistency Team, 1210)

1.c Sampling and Analysis

Comment 1.c.i. *LANL shall provide a separate and distinct discussion of the variances from the approved RFI Workplan within the RFI report.*

LANL Response:

Variances from the RFI work plan were noted in the report. However, the discussion of these variances was not consistently located within the discussion of each PRS. LANL will amend the "Field Investigation" section for each PRS, as needed, to identify the variances from the work plan, and the reason for the variance.

The amended text will be supplied to HRMB by July 15, 1997.

Comment 1.c.ii. *LANL shall not use composite sampling for determining the presence or absence of contaminants or for determining the nature and extent of contamination. As a result of this lack of adequate and useable data, LANL shall re-sample at PRSs 18-002(a-c) and 27-002.*

LANL Response:

The collection of composite samples was proposed, and approved, in the RFI work plan. The intended purpose of collecting composite samples, as stated in Section 5.1.5.3.2 of the work plan was to increase the likelihood of detecting high concentrations of potential contaminants without significantly increasing costs over that associated with a smaller number of sampling locations. The approved work plan proposed a method of evaluating the significance of the use of composite samples through a statistical evaluation. The samples were collected in accordance with the approved work plan. The statistical evaluation was presented in the RFI report (Section 4.4, Paragraph 4) and concluded that the compositing of samples did not alter the evaluation, as compared with the collection of discrete samples from a smaller number of locations. LANL will expand Section 4.4 to present a more complete discussion of the statistical evaluation in order to better justify the use of composite samples. LANL sees no basis for resampling in order to obtain discrete samples from the firing site areas.

The enhanced statistical evaluation will be provided to HRMB by July 15, 1997.

Comment 1.c.iii. *LANL shall not use field instrumentation to determine the types of analyses to be conducted at investigations aimed at determining the presence or absence of contamination. When field instrumentation is used for screening, LANL shall provide assurances (such as detection limits and calibration records) that appropriate Quality Assurance/Quality Control criteria were adhered to. In addition, LANL must obtain confirmatory samples when using field screening to determine the presence or absence of contamination.*

LANL Response:

The only instance where field screening was used for determining what analyses would be conducted was at PRS 18-003(a)—a holding tank—and the septic tanks associated with PRSs 18-003(b, c, and d), where PID readings were used to determine the need for VOC and SVOC analysis. Subsequent to the RFI report, the contents of all these tanks have been removed as detailed in the Interim Action Report (Environmental Restoration Project 1996, ER ID No. 55044), and those wastes have been fully characterized (including VOC and SVOC analysis). LANL will update the data comparison tables as necessary to include this analytical data.

The updated tables will be provided to HRMB by July 15, 1997.

Reference:

Environmental Restoration Project, September 1996. "Interim Action Completion Report for Potential Release Sites 18-003(a-d, g), Holding Tank and Septic Tanks, Field Unit 2," Los Alamos National

Laboratory Report LA-UR-96-3340, ER ID No. 55044, Los Alamos, New Mexico. (Environmental Restoration Project 1996, ER ID No. 55044)

Comment 1.c.iv. *LANL did not address EPA's comment on the RFI Workplan requiring 4 out of 32 wetland samples be obtained from a depth of 1 to 6 inches. [Letter from Honker (USEPA Region VI) to Vozella dated May 7, 1994]*

LANL Response:

LANL will collect the indicated samples. LANL proposes to collect one sample at each of four wetland areas: WL-5, WL-6, WL-7, and WL-8. Samples from these locations reported the highest frequency of inorganics above background or of organics. Details of the additional sampling will be included in the sampling plan proposed in the response to Comment 1.a.ii.

Comment 1.c.v. *LANL shall provide the number or percentage of media samples from each PRS that were analyzed by a fixed laboratory and indicate whether the laboratory was off-site or on-site. HRMB requires 20% of the samples collected for fixed laboratory analysis be analyzed by an off-site laboratory.*

LANL Response:

All analytical data used for background and screening comparisons (as tabulated in Appendix D of the RFI report) were provided by analysis at fixed laboratories. Field screening data or mobile laboratory were used primarily for the purpose of biasing sampling locations (see exception noted in Comment 1.c.iii) and were not used for risk-based decisions. The Document of Understanding, Annex G, Sampling and Analysis Guidelines, allows for analysis at on-site and off-site laboratories provided appropriate data quality levels are met. All data used for decision making purposes in the RFI Report for OU 1093, with the exception noted in Comment 1.c.iii, met required quality specifications.

1.d Typographical or Reporting Errors.

Comment 1.d.i. *PRS numbers were not indicated on several figures (Figures 4-2 through 4-5; and Figures 4-9 through 4-12).*

LANL Response:

LANL will revise the figures as needed to indicate PRS locations, and submit them to HRMB by July 15, 1997.

Comment 1.d.ii. *Names of wells and buildings were inconsistently used. For example, Building 18-32 is often indicated as Criticality Building or Facility on the figures.*

LANL Response:

LANL will review text and figures and revise as needed to ensure consistency in the use of well and building designations, and supply necessary revisions to HRMB by July 15, 1997.

1.e Appendices

Comment 1.e.i. *LANL must conduct TCLP analyses for waste characterization and present the results in the RFI report when offsite disposal of wastes is proposed. [Programmatic Issues from NODs dated January 16, 1995]*

LANL Response:

The present RFI report framework policy does not require the submission of waste characterization data. All hazardous wastes are managed consistent with the Laboratory's RCRA operating permit. TCLP analyses are only conducted on wastes with a potential for exceeding TCLP values. For example, if no D-listed constituents were detected in samples associated with the waste at concentrations more than 20-times the TCLP regulatory levels, the waste cannot exceed TCLP values, and no TCLP analysis is conducted. All appropriate analyses, as required by the intended disposal location, are conducted before waste disposal. A second paragraph will be added to Section 1.3 of the RFI report to address the broader issue of hazardous waste management, as given below:

All wastes generated by field activities, and by any follow-on remediation work are managed in compliance with the Laboratory's RCRA operating permit and DOE Orders addressing radioactive and mixed waste management. Wastes are stored, characterized, treated as necessary, and disposed in compliance with these requirements. The Laboratory conducts periodic self-assessments to ensure compliance with appropriate requirements, and is periodically audited by DOE and HRMB against the requirements.

Comment 1.e.ii. *LANL shall provide documentation indicating that appropriate Quality Assurance/Quality Control (QA/QC) samples were obtained and analyzed per EPA guidance. To substantiate that the appropriate QA/QC samples were obtained, a discussion of the QA/QC samples obtained and analyzed must be presented along with a description of QA/QC problems encountered. [Programmatic Issues from NODs dated January 16, 1995]*

LANL Response:

LANL will provide a description of the QA/QC samples collected and analyzed at each PRS. A discussion of any QA/QC problems encountered during the analyses of these samples will also be presented consistent within the current RFI format. This description will be added to the text under the respective headings such as Organics, Inorganics, etc.

The amended text will be provided to HRMB by July 15, 1997.

Comment 1.e.iii. *LANL shall provide an explanation of the fields and comments of the analytical results in Appendix D.*

LANL Response:

The following information is added to Appendix D.

All data in this appendix are from sample analysis at fixed laboratories. Several of the column headings are self-explanatory, i.e., analyte, location ID, sample ID, sample value, background value, SAL value, units, sample location, and suite, while others may not be as clear. Column heading descriptions for these columns are as follows:

- **BEGIN** beginning depth from which the sample was collected;
- **END** ending depth from which the sample was collected;
- **UNITS** the units that accompany the sample depths, i.e., inches (in) or feet (ft);
- **MAT** environmental matrix of the sample; SS indicates soil (or sludge from septic tanks) and W indicates water, including liquid from septic tanks.
- **S** symbol column; blank, indicates a detection, and "less than" symbol (<), indicates that the analyte was undetected.
- **FIELD CODE** identifies QA/QC samples collected during the field investigation.
 - FD = field duplicate;
 - EB = equipment blank;
 - PE = performance evaluation sample;
 - FB = trip blank and;
 - FR = field blank.
- **LAB CODE** identifies laboratory QA/QC samples.
 - D = laboratory duplicate
 - R = replicate.
- **EPA QUAL** qualifier column for data qualifiers provided following data validation. (The FIMAD data base did not contain qualifiers for most of the data when Appendix D was printed.)
 - UJ = undetected estimated;
 - J = estimated;
 - R = unusable and;
 - N = presumptive evidence of presence.
- **TECH CODE** presents the analytical technique used in the analysis.
- **REQUEST NUMBER** LANL internal numeric applied to the written request sent to an analytical laboratory for analysis of a sample or group of samples;
- **REPORT NUMBER** LANL internal numeric applied to the written report from the analytical laboratory documenting the analytical results for a sample or group of samples. The report number provides a reference if the hard copy data package needs to be retrieved.

Comment 1.e.iv. *LANL shall provide a summary of all analytical data in Appendix D regardless of nondetectable concentrations.*

LANL Response:

LANL will ensure that the sampling plans presented in the RFI report correctly summarize the analyses presented in Appendix D. Any variances from the analyses proposed in the RFI Work Plan will be included in the revised text referenced in the response to Comment 1.c.i.

Any corrections to the respective sampling plans will be provided to HRMB by July 15, 1997.

Comment 1.e.v. *It is not clear if the analytical results presented in Appendix D were obtained from a mobile analytical laboratory, an on-site fixed laboratory, an off-site fixed laboratory, or a combination. LANL shall revise the appendix to provide this information.*

LANL Response:

All data in Appendix D are from fixed analytical laboratories See also the response to Comment 1.c.v and 1.e.iii.

2. SPECIFIC COMMENTS

2.a Background Data Assessment

Comment 2.a.i. *Section 3.2.1 Background Data Comparison: LANL shall use a 95th confidence level of the 95 percentile of distribution to compute the UTL. See comment 1.a.iv. [Agreements and Action Items from Joint Environmental Protection Agency, Department of Energy, and University of California Meeting Held on September 18-19, 1995; EM ER:95-541, dated October 4, 1995]*

LANL Response:

See response to Comment 1.a.iv.

Comment 2.a.ii. *Section 3.2.1 Background Data Comparison: All RFI reports submitted after October 1, 1996 shall use laboratory-wide background data for screening and risk-based decisions and show the comparison to background using the most current, revised background data [Programmatic Issues from NODs dated January 16, 1995]*

LANL Response:

This RFI report was submitted to EPA in November 1995. At that time, site-wide background data were only available for Bandelier Tuff and soils. Applicable background data were and are still not available for the alluvial aquifer in Pajarito Canyon, except for that gathered from upgradient wells as part of this RFI. LANL will evaluate any changes in conclusions that result from replacing background values used in the RFI report (including site-specific soil concentrations) with presently available site-wide UTLs. See responses to Comment 1.a.iv (use of 95th percentile UTLs) and Comment 2.a.vi (background wells).

Comment 2.a.iii. *Section 3.2.1: No reference material or discussion is provided regarding where site-specific background soil samples were obtained and how the site-specific values were determined for comparison. See comment below.*

LANL Response:

The text in Section 3.2.1 explains that the samples for site-specific background values for soil and groundwater were collected from boreholes (completed as wells) located west of TA-18; Figure 3.2 shows the locations of these wells. The text in that section, Paragraph 3 under Background Wells explains that the maximum value of each analyte detected in the soil or groundwater was used as the site-specific background value. There were not sufficient data points to calculate a meaningful 95th percentile UTL, and the maximum value is considered to be a conservative estimate.

Comment 2.a.iv. *Section 3.2.1: Because the RFI report is a "stand-alone" document, a tabulated summary of concentrations, a checkplot showing the sampling locations, and a concise overview of the methodology for determining the UTL and SAL shall be provided for the both the site-wide and site-specific background information. See comments 1.b.i and 1.b.ii.*

LANL Response:

See response to Comment 1.b.ii regarding checkplots.

The following material will be used to augment the existing text in Section 3.2.1 of the RFI report. Revised text will be submitted to HRMB by July 15, 1997.

Background

Detected inorganic chemicals are compared with natural background distributions to determine if they should be retained as COPCs or eliminated from further evaluation. The inorganic background data used in this RFI report are from the following sources:

- Soil and sediment samples collected throughout Los Alamos County for which chemical analyses were performed for certain inorganic (i.e., metal) chemicals (Longmire et al. 1995, 1142; Longmire et al. 1995, 1266). The all-soil-horizon background data set (inclusive of the A, B, and C horizons) was used because the soil master horizon was not identified during the sampling.
- Background concentrations of data collected up-canyon from the PRSs being reported. To obtain an estimate of the site-specific background concentrations of inorganics, three boreholes (two of which were completed as wells) were drilled in Pajarito Canyon—up-canyon from any potential release sources at TA-18. The soil from the borings were analyzed for target analyte list (TAL) metals and mercury. The maximum detected concentration of each analyte was used as an estimated background concentration. Estimates of the site-specific background for TA-18 were obtained because of the presence of other potential contaminant sources upgradient from this technical area.

Comparisons between site data and site-wide background data are performed by comparing each observed concentration datum with a chemical-specific screening value that is the upper tolerance limit (UTL). The current background UTL is the 95% upper confidence limit of the 95th percentile of the background distribution (Ryti et al. 1996, 1298).

SALs

See response to Comment 1.a.v for an overview of how soil SALs are derived.

References:

Longmire, P., S. Reneau, P. Watt, L. McFadden, J. Gardner, C. Duffy, and R. Ryti, January 1995. "Natural Background Geochemistry, Geomorphology, and Pedogenesis of Selected Soil Profiles and Bandelier Tuff, Los Alamos, New Mexico," (draft) Los Alamos National Laboratory Report LA -12913-MS, Los Alamos, New Mexico. (Longmire et al. 1995, 1142)

Longmire, P. A., D. E. Broxton, and S. L. Reneau (Eds.), October 1995. "Natural Background Geochemistry and Statistical Analysis of Selected Soil Profiles, Sediments, and Bandelier Tuff, Los Alamos, New Mexico," Los Alamos National Laboratory Report LA-UR-95-3486, Los Alamos, New Mexico. (Longmire et al. 1995, 1266)

Ryti, R., P. Longmire, and E. McDonald, March 29, 1996. "Application of LANL Background Data to ER Project Decision-Making, Part I: Inorganics," Los Alamos National Laboratory Report LA-UR-96-1534, Los Alamos, New Mexico. (Ryti et al. 1996, 1298)

Comment 2.a.v. Table 3-1, page 3-5: For comparison purposes, LANL should include SALs on Table 3-1.

LANL Response:

Table 3-1 of the RFI report has been amended as follows, using the SAL values based on EPA Region IX residential PRGs for soil and appropriate water quality standards. (See response to Comments 1.a.iii and 1.a.v regarding replacement of former SAL values.)

**TABLE 3-1
MAXIMUM DETECTED VALUES OF INORGANICS
IN THE BACKGROUND WELLS**

Analyte	SAL (mg/k)	Background UTL (mg/kg)		Site-Specific Background (Soil) (mg/kg)	New Mexico Groundwater Standards (µg/L)	Site-Specific Background (Groundwater) (µg/L)
		Current	Former			
Arsenic	N/A ^a	7.82	11.6	2.9	100	4.8
Barium	5,300	315	1,140	116	1,000	214
Beryllium	N/A ^b	1.95	3.31	0.48	N/A (4) ^c	1.8
Chromium	210	19.3	34.2	54.2	10	19.1
Cobalt	4,600	19.2	51.1	3.04	N/A (1,000) ^d	7.4
Copper	2,800	15.5	15.7	15.3	1,000	25
Lead	400	23.3	39	9.2	1,000	14.1
Manganese	3,200	714	1,030	375	200	523
Mercury	23	0.1	0.1	0.05	2	Not Detected
Nickel	1,500	15.2	26.7	12.2	N/A (100) ^e	Not Detected
Selenium	380	1.7	1.7	0.49	50	Not Detected
Thallium	5.4	1.0	0.9	1.7	N/A (2) ^c	3.9
Vanadium	41.9	41.9	66.2	17.3	N/A (100) ^d	27.5
Zinc	50.8	50.8	101	41.8	10,000	64.3

- ^a SAL for arsenic is below the site-wide background value; therefore, the background UTL is used for the SAL comparison.
- ^b SAL for beryllium is below the site-wide background value; therefore, the background UTL is used for the SAL comparison.
- ^c Groundwater standard not available; number in parentheses is Drinking Water Standard for EPA and NMED.
- ^d Groundwater standard not available; number in parentheses is New Mexico Standard for Livestock Watering.
- ^e Groundwater standard not available; number in parentheses is New Mexico Drinking Water Standard.

Comment 2.a.vi. Section 3.2.1, Background wells: *The close proximity of all three background groundwater monitoring wells in Pajarito Canyon fails to provide a true characterization of the alluvial ground water system within the canyon. The well placement focused only on a small area with limited opportunity for natural variability.*

LANL Response:

A single upgradient well is a common approach for characterizing groundwater quality at RCRA sites. In this instance, two wells in close proximity were constructed and sampled in the center of the somewhat linear aquifer, close to TA-18 within Pajarito Canyon, but upgradient of any influence of operations at the site. Wells substantially more upgradient will not necessarily reflect the quality of water flowing into the portion of the aquifer at the TA-18 boundary. An upgradient well was not constructed in Threemile Canyon, but the water issuing from Threemile Spring was sampled as part of the wetland sampling. That spring, which is perennial, is either directly associated with or is the source of recharge for the alluvial aquifer in Threemile Canyon, upgradient from its confluence with Pajarito Canyon. LANL acknowledges that the data from that spring were not used in determining background groundwater quality. However, as part of the site-wide hydrogeologic investigation, LANL has proposed to drill additional wells in the alluvium within both Threemile and Pajarito canyons. Those data will be used to support a more complete evaluation of background (upgradient) water quality for the area covered by this RFI report. See response to Comment 1.a.ii.

Comment 2.a.vii. Section 3.2.2 Comparison with Screening Action Levels Other Standards: *LANL shall base its SALs on USEPA Region IX preliminary remediation goals for a residential scenario. See comment 1.a.v.*

LANL Response:

See response to Comment 1.a.v.

2.b Section 4.1. Septic Systems

2.b.i General

Comment 2.b.i(1). *For those septic systems and associated lines where hazardous constituents were identified above background in both the septic settling or holding tank and in the subsurface, LANL shall evaluate the integrity of the septic system drain lines.*

LANL Response:

In a meeting held with HRMB on April 21 it was clarified that this comment expresses a concern for the extent to which residual contamination in the septic tank, associated drainlines, and drainfield soils could be transported from the respective PRS, principally by groundwater. This concern bears directly on the final disposition of the septic system components, as addressed in Comment 2.b.i.(3). The Laboratory is developing a ER position on closure of septic tanks (and ancillary features) that will address this issue. It is expected that this position will be discussed with HRMB during May 1997. In addition, additional ground water monitoring, as proposed in the response to Comment 1.a.ii, will address the potential for future release of potential contaminants to groundwater.

Comment 2.b.i(2). *For those septic systems and associated lines where hazardous constituents were identified above background in the septic settling or holding tanks, LANL shall perform interim measures to prevent further discharge into the environment.*

LANL Response:

As described in the RFI report (Section 3.2.1), the concentrations of inorganic constituents in the holding tank and septic tanks were not compared with background UTLs because such a comparison is not considered appropriate. Rather, all detected concentrations were presented in the data comparison tables for both inorganic and organic constituents. However, LANL recognized that there was a continuing potential for release of the contaminants in the tanks to the environment. Thus, LANL proposed in the RFI report to remove the contents of the tanks at PRSs 18-003(a, b, c, d, and g). This was done as an interim action in the summer of 1995. The results of that work is documented in an interim action report (Environmental Restoration Project 1996, ER ID No. 55044).

Reference:

Environmental Restoration Project, September 1996. "Interim Action Completion Report for Potential Release Sites 18-003(a-d, g), Holding Tank and Septic Tanks, Field Unit 2," Los Alamos National Laboratory Report LA-UR-96-3340, ER ID No. 55044, Los Alamos, New Mexico. (Environmental Restoration Project 1996, ER ID No. 55044)

Comment 2.b.i(3). *For each inactive septic tank, LANL shall remove or, at a minimum, backfill the tank with a solid, non-porous material (such as flow crete). However, any action other than removal of the tank and associated lines may not be considered as a final disposition appropriate for NFA. See following site-specific comments.*

LANL Response:

The facilities that formerly discharged wastes to the septic tanks at TA-18 have been removed or taken out of service, so no additional discharges to the tanks are expected. The holding tank—PRS 18-003(a)—has been cleaned, but remains in service to receive discharges from an emergency radioactive decontamination facility. The operating group at TA-18 plans to replace that holding tank with an aboveground unit this fiscal year. No further remedial action will be taken at the tanks until an agreement has been reached on acceptable methods for septic system abandonment. (See response to Comment 2.b.i(1)).

2.b.ii Section 4.1.1 18-003a-b) Settling Pit, Septic Tank and Drainfield. *These active PRSs are proposed for accelerated cleanup which includes the removal of the septic tanks' contents and pressure rinsing of the septic tanks.*

Comment 2.b.ii(1). *The Settling Pit [18-003(a)] was found to contain elevated concentrations of Volatile Organic Compounds (VOCs) and Polyaromatic Hydrocarbons (PAHs); no VOC or Semivolatile Organic Compound (SVOC) analyses were conducted at the Septic Tank [18-003(b)]. Groundwater samples obtained southwest of the Drainfield and at MW-3 (sample location 18-2015) were found to contain concentrations of 1,2-dichloroethane (DCA) greater than SALs. 1,2-DCA is attributable to site activities and, can possibly be related to septic activities at PRSs 18-003(a) and 18003(b).*

LANL Response:

As noted in the response to Comment 2.b.i.(3), the contents of these tanks were removed by an interim action. VOC and SVOC analyses were conducted as part of that action. PRS 18-003(a) remains in service until a replacement tank is installed. PRS 18-003(b) has been taken out of service. See response to Comments 1.c.iii and 2.b.i(2).

Comment 2.b.ii(2). *LANL shall conduct further investigations to determine the integrity of the drainlines associated with these PRSs, confirm or eliminate 18-003(b) as a potential alternate source by performing the proper analyses (including SVOCs), and determine the nature and extent of the resulting groundwater contamination. All groundwater wells within this vicinity should also be analyzed for high explosive (HE) compounds using SW-846 Method 8330 to provide a comprehensive site-wide survey of these constituents and to determine if these PRSs may have contributed to the overall degradation of the alluvial ground water system.*

LANL Response:

The integrity of the drainlines and the possible source(s) of DCA at PRSs 18-003(a and b) is addressed in the response to Comment 2.b.i(1). LANL will present data on VOC and SVOC analysis of the contents of PRS 18-003(b). See response to Comment 1.c.iii. However, LANL believes that the characterization of this site conducted during the RFI and in the subsequent interim action demonstrate that these sites do not pose a threat to human health. Issues pertaining to characterization of the nature and extent of contamination, and presence or absence of HE compounds are addressed in the response to Comment 1.a.ii.

Comment 2.b.ii(3). *It is recommended that sampling locations and analytical results from the LACEF wells, and any other pertinent sampling locations, be presented concurrently with these PRSs. This would provide additional data by which a more comprehensive evaluation could be made of this PRSs.*

LANL Response:

LANL considered developing a single figure that would include all data for PRSs 18-003(a and b) and the LACEF wells. The quantity of data precluded doing so on a 8-1/2- x 11-in. figure. The text in Section 4.1.1.4 of the RFI report refers the reader to Section 4.7.2, which discusses the data from the LACEF wells. HRMB's recommendation to provide all data on a single figure will be addressed in developing the checkplots requested in Comment 1.b.ii.

2.b.iii Section 4.1.2 18-003(c) Septic Tank and Drainfield. *This active PRS is proposed for accelerated cleanup which includes the removal of the septic tank's contents and pressure rinsing of the septic tank.*

Comment 2.b.iii(1) Further Investigations. *LANL shall conduct further investigations at this PRS in order to determine the following: the presence or absence of VOCs in the septic tank; the presence or absence of contaminants in the subsurface between the drainfield and the nearest surface water body; the integrity of the drainlines associated with the PRS; the source of the groundwater contamination (at a minimum, eliminate the septic tank and its associated drainlines and drainfield as a potential source); and the nature and extent of the identified groundwater contamination.*

LANL Response:

This PRS is not active. It was taken out of service in 1996. See response to Comment 2.b.i.(1) and 2.b.ii(2).

Comment 2.b.iii(2). *LANL shall obtain or provide analytical results for sediment samples at the following locations in Threemile Canyon: up-gradient of Threemile Springs 3A and 3B; downgradient of Threemile Springs 3A and 3B and upgradient of the influence of the firing sites, 18-002(b, c); downgradient of the firing sites [18-002(b, c)] and upgradient of TA-18 Spring; and downgradient of TA-18 Spring. These samples shall be analyzed for 40 Code of Federal Regulations Appendix IX constituents including HE using SW-846 Method 8330.*

LANL Response:

The objective of the RFI was to investigate PRSs located within TA-18, rather than possible releases from PRSs upgradient from TA-18. As a result, there was no extensive sampling of water and sediment upstream from TA-18. Water and sediment samples were collected from areas just upgradient from facilities in TA-18, primarily to evaluate the possible accumulation of contaminants within the wetlands. LANL acknowledges that the RFI data for springs in Threemile Canyon and groundwater in Pajarito Canyon upgradient of TA-18 indicate the presence of contaminants introduced upgradient from TA-18. The presence, and possible source(s) of these contaminants, will be considered in developing a sampling plan for the alluvial wells proposed as part of the site-wide hydrogeologic evaluation (see response to Comment 1.a.ii).

2.b.iv. Section 4.1.3 18-003(d) Septic Tank and Drainfield: *This active PRS is proposed for accelerated cleanup which includes the remove of the septic tank's contents and pressure rinsing of the septic tank.*

Comment 2.b.iv(1). *The septic tank [18-003(d)] was found to contain elevated concentrations of VOCs and solvents. A groundwater sample obtained north of the drainfield was found to contain concentrations of 1,2-DCA greater than its SAL. 1,2-DCA is attributable to site activities and, possibly to PRS 18-003(d).*

LANL Response:

This septic system is not active. It was taken out of service in 1996. LANL believes (and states in the RFI report) that PRS 18-003(d) is the source of the 1-2 dichloroethane detected in groundwater. A corrective action program, consisting of the construction and sampling of five shallow monitoring wells in the vicinity of the site, is now in progress to address this issue.

Comment 2.b.iv(2). *LANL shall conduct further investigations to determine the integrity of the drainlines associated with the PRS, confirm or eliminate the septic tank as a potential source of the groundwater contamination, and determine the nature and extent of the groundwater contamination.*

LANL Response:

The issue regarding integrity of the drainlines is addressed in the response to Comment 2.b.i.(1). The remaining issues in the comment are addressed by the response to Comment 2.b.iv.(1).

Comment 2.b.iv(3). *LANL shall provide in its NOD response clarification to the following issue: The analytical results as indicated on Figure 4-4 for sample AAA5827, sample location 1044, differ from the*

Appendix D analytical results spreadsheet to Table 4.1: 1,1-DCA is greater than SALs in Appendix D. In addition, Table 4-1 does not indicate that the sludge samples were analyzed for VOCs and SVOCs as shown in Figure 4-4.

LANL Response:

Figure 4-4 will be corrected to indicate that 1-1 DCA is greater than the New Mexico Groundwater Quality Standard. Table 4-1 will be corrected to indicate analysis of VOC and SVOC. These corrections will be submitted to HRMB by July 15, 1997.

2.b.v. Section 4.1.4 18-003(f) Septic Tank: *This inactive PRS is proposed for NFA based on the absence of hazardous constituents above action levels.*

Comment 2.b.v(1). *LANL shall conduct further investigations to determine the integrity of the drainlines associated with the PRS, confirm or eliminate the septic tank as a potential source of the groundwater contamination, and determine the nature and extent of the groundwater contamination.*

LANL Response:

No groundwater contamination was detected at this site. Concentrations of all inorganics in filtered samples were below the site-specific background concentrations (also measured in filtered samples) except for nickel, which was not detected in the groundwater samples from the background wells. Acetone was reported in one groundwater sample at a concentration substantially below the SAL and the Region 9 PRG for tap water. Acetone is a common analytical laboratory contaminant and may not be related to waste discharges to this PRS. These conclusions will be re-evaluated as part of the summary of changes resulting from the use of revised UTLs and Region 9 PRGs for SALs (see response to Comments 1.a.v and 1.a.iv). LANL sees no justification for further investigation specific to this PRS. However, the presence of this PRS will be considered in developing a more comprehensive groundwater monitoring plan for the TA-18 area. See response to Comment 1.a.ii.

2.b.vi Section 4.1.5 18-003(g) Septic Tank: *This active PRS is inappropriately proposed for NFA based on the following deficiencies:*

Comment 2.b.vi(1). *LANL eliminated a COPC (1,1,2-trichloro-1,2,2-trifluoroethane) based on "no reasonable pathway" for human exposure. The rationale for eliminating this COPC is inappropriate. LANL has yet to obtain basic information necessary to conclude that interconnection between the shallow alluvial aquifer and the regional aquifer does not exist. LANL must use SALs based on Region IX PRGs or calculate a SAL using Subpart S guidance. See comment 1.a.v.*

LANL Response:

The following information will be incorporated into a summary of the effects of replacing previous SALs with EPA Region 9 PRGs, as described in the response to Comment 1.a.v.

The volatile organic compound—1,1,2-trichloro-1,2,2-trifluoroethane—was reported in one subsurface soil sample, in the depth interval 84 to 120 in. at a concentration of 0.013 mg/kg. This value is slightly above the reported detection limit (0.006 mg/kg) and may be a false positive. At the time of the RFI report, there was no SAL for this compound because of the lack of adequate toxicity information. The most recent EPA Region 9 PRG tables (EPA 1996, 1351) include a residential PRG for this chemical. The value is based on the soil saturation equation ("sat") and is not risk based. The SAL from this table is 5,600 mg/kg, which is several orders of magnitude greater than the detected value for this chemical. The health-based Region 9 PRG for this compound is 21,000 mg/kg, which is also several orders of

magnitude greater than the detected concentration. Therefore, 1,1,2-trichloro-1,2,2-trifluoroethane can be eliminated as a COPC because it is less than SAL.

Reference:

EPA (US Environmental Protection Agency), August 1, 1996. "Region 9 Preliminary Remediation Goals (PRGs), 1996," San Francisco, California. (EPA 1996, 1351)

Comment 2.b.vi.(2). *LANL shall clarify the rationale for locating sample 18-1275 at such a great distance from the potential source. The reviewer questions the representativeness of the sample.*

LANL Response:

The location of the well at location 18-1275 is the same as proposed in the approved RFI work plan. As indicated in Figure 4-6, the well is approximately 15 ft from the septic tank—PRS 18-003(g). The general direction of groundwater flow, as indicated in Figure B-3, is eastward, but probably has a south-easterly vector towards the ephemeral stream in Pajarito Canyon. The well was placed in a location that is believed to be generally downgradient from the tank, and for this reason LANL believes the well is appropriately located to detect any significant groundwater contamination resulting from possible past releases from the tank.

Comment 2.b.vi.(3). *The analytical results for sample location 18-1275 (samples AAB4696, 0218-95-0256, and 0218-95-0257) are not addressed in the text. LANL must provide a discussion of these analytical results.*

LANL Response:

The format of the RFI report requires discussion only of inorganic and radionuclide data that are above background concentrations and all detected organics. As described in Section 4.1.6.3.1, no inorganics were detected above background outside the septic tank (at location 18-1275). One organic compound (1,1,2-Trichloro-1,1,1-trifluoroethane) was detected at location 18-1275, which is indicated in Figure 4-6, discussed in the text in Section 4.1.6.3.1, and addressed in the response to Comment 2.b.vi(1). Table 4-24 incorrectly identifies that compound as being reported for location 18-1045. Figure 4-6 indicates that acetone was detected in the groundwater at location 18-1275 in the sample collected from the well in 1995, but discussion of acetone was inadvertently omitted from the text and Table 4-24.

Acetone was detected in two samples at concentrations of 13.5 and 35.4 µg/L. Although acetone is a common laboratory contaminant, the laboratory blank did not detect acetone. Therefore, it must be assumed that the detections of acetone are valid. There is apparently no water quality standard for acetone, but Region 9 does list a PRG for tap water of 610 µg/L (EPA 1996, 1351). Because the PRG is more than an order of magnitude greater than the detected acetone concentrations, acetone is not considered a COPC at this PRS.

The above information will be used to revise the text and figure in Section 4.1.6.3.1 and the revision submitted to HRMB by July 15, 1997. (See also response to Comment 1.a.iv regarding use of new background values.)

Reference:

EPA (US Environmental Protection Agency), August 1, 1996. "Region 9 Preliminary Remediation Goals (PRGs), 1996," San Francisco, California. (EPA 1996, 1351)

Comment 2.b.vi.(4). *Table 5-1 indicates that the tank sludge was not sampled for uranium (U) or plutonium (Pu) even though the RFI Workplan specifies that they are COPCs at the PRS. LANL must provide an explanation why these constituents were not analyzed for.*

LANL Response:

As suggested in Section 4.1.6.2 of the RFI report, there was not sufficient sludge in the tank to allow for analysis of all potential contaminants. The text did not clearly state this fact. Because it was believed that organic contaminants were of greatest concern at this PRS, a field decision was made that the available sludge material would be analyzed for VOCs and SVOCs. During the interim action at this PRS it was possible to collect adequate sludge to conduct analysis for U and Pu. The data are presented in the interim action plan for this PRS (Environmental Restoration Project 1997, ER ID No.) and indicate that low levels of U and Pu were present in the sludge.

Reference:

Environmental Restoration Project, April 1997. "Interim Action Plan for Potential Release Sites 18-003(a-d,g), Field Unit 2," Los Alamos National Laboratory report, ER ID No., Los Alamos, New Mexico. (Environmental Restoration Project 1997, ER ID No.)

2.b.vii Section 4.1.7, Septic Tank 18-003(h): *This active PRS is inappropriately proposed for NFA based on the following deficiencies:*

Comment 2.b.vii(1). *No ground water samples appear to have been obtained downgradient of the PRS. LANL must ensure that ground water has not been adversely affected by the PRS.*

LANL Response:

The attempt to construct a well at location 18-1285, the location proposed in the approved RFI work plan, is described in Section 4.1.7.2. The text indicates that it was not possible to complete the well at that location because of penetrating the sewer line carrying discharge from PRS 18-003(h) and that there was no alternative location to drill because of a lack of space. The reported location of the sewer line, as indicated in Figure 5-13 of the RFI work plan, was east of its actual location. Figure 4-6 indicates, perhaps inadequately, that there is a nearly 4-ft elevation difference between the surface at PRS-18-003(h) and the location of the proposed well. The slope of the surface near PRS 18-003(h) prevented positioning the drill rig in an alternative location in close proximity to the septic tank. The uncertain location of the sewer line discouraged any attempt to move a short distance further east, and construction of a monitoring well further than 15 to 20 ft from the tank was not felt to produce representative samples of the possible influence of the tank on groundwater. Accordingly, no alternative location was selected. As stated in Section 4.1.7.3.1, no COPCs were detected in the tank at concentrations above SAL; LANL believes that further investigation at this PRS is not justified. This conclusion will be re-evaluated as part of replacing the SAL values used in the RFI report with Region 9 PRGs and appropriate water quality standards (see response to Comment 1.a.v).

Comment 2.b.vii(2). *Building 18-152 (as indicated in the text on p. 4-58) is not located on Figures 1-2 or 4-6. LANL must revise the text and or the figure.*

LANL Response:

The text incorrectly stated Building 18-152. The text should have stated Structure 152, which is the septic tank as indicated in Figure 4-6. The text will be revised, and the revision submitted to HRMB by July 15, 1997.

Comment 2.b.vii(3). *Locations of the attempted borings (Section 4.1.7.2) are not indicated on the corresponding figure in the RFI report. LANL must revise the figure.*

LANL Response:

The boring (location 18-1285) is shown in the figure, but the text did not specifically identify that location as the boring in question. Revised text will be submitted to HRMB by July 15, 1997.

Comment 2.b.vii(4). *Sample location (18-1285) is not located near the PRS and may not be physically or statistically representative of the PRS. LANL must either obtain additional samples or provide assurances that the sample obtained adequately characterizes the PRS.*

LANL Response:

The primary purpose for drilling the borehole at Location 18-1285 was to collect groundwater samples. The location was selected so as to be downgradient from the PRS, and sufficiently close to detect the presence of significant groundwater contamination. The entire sampling strategy was premised on the possible presence of potential contaminants in the septic tank, PRS-18-003(h). As indicated in the response to Comment 2.b.vii(1), it was not possible to locate a groundwater sampling point in a more representative location. However, as also noted in that response, no contaminants were detected in the tank.

Comment 2.b.vii(5). *The tank liquids, soil, and ground water were not sampled for inorganic constituents even though the RFI Workplan (Table 5-1) cites beryllium, uranium, silver, and plutonium as potential contaminants of concern. LANL must clarify why the samples were not analyzed for these constituents and sample the tanks, soil, and ground water for them.*

LANL Response:

As indicated in Table 4-1 of the RFI report, liquids from the tank and soil from location 18-1045 were analyzed for inorganics. As noted in Section 4.1.7.2, there was no sludge in the tank, and it was not possible to collect groundwater samples. The data for inorganic constituents in the tank water are presented in Tables 4-26 and 4-27. As noted in Section 4.1.7.3.1, no inorganic concentrations in the soil samples are above background. This conclusion will be re-evaluated as part of a revision of the UTL values used in the report (see response to Comment 1.a.iv).

2.c. Section 4.2 Sumps, Tanks, and Drains

2.c.i Section 4.2.1 18-004(a,b) Industrial Drainlines, Collection Tanks. *This inactive PRS is inappropriately proposed for NFA based on the following deficiencies:*

Comment 2.c.i(1). *LANL must provide the analytical results for the wipe samples obtained for this PRS; they were not found in Appendix D.*

LANL Response:

Swipes were taken of the interior of the pipe, and the radiation level was measured. Results were reported at or below instrument background. The text will be revised to include information on the sensitivity of the radiation detector. Revised text will be submitted to HRMB by July 15, 1997.

Comment 2.c.i(2). *Table 4-28 of the RFI report indicates that the wipes were only sampled for U and gross alpha/beta/gamma, although the RFI Workplan indicates that the solvents and acids were also utilized at the PRS. LANL must provide the rationale for not sampling for solvents and acids at this PRS.*

LANL Response:

There was no material to collect from the accessible portion of the pipe for analysis for solvents, acids, or uranium. That was not explained in the text. Revised text will be submitted by July 15, 1997.

Comment 2.c.i(3). *Subsurface soils and ground water were not adequately (none were obtained) sampled and characterized at this PRS. LANL must ensure that subsurface soils and ground water have not been adversely affected by this PRS.*

LANL Response:

The approved RFI work plan proposed sampling the surface of the concrete in the former containment pit; no groundwater sampling was proposed. As noted in Section 4.2.1.2 of the RFI report, it was not possible, using geophysics, to locate the concrete because of the interfering effects of numerous underground utilities. There is no information as to whether remnants of the pit even exist. It is not possible to excavate at the site, because that excavation would block a vehicle path necessary to both site operations and security personnel; site security procedures preclude blocking this location. There is no evidence of a release of contaminants at this site, and LANL believes NFA is appropriate. However, if HRMB will not approve a request for NFA, LANL will request that investigation of these PRSs be deferred until site decommissioning.

2.c.ii Section 4.2.2 18-012(a) Outfall: *This non-Hazardous and Solid Waste Amendment (HSWA) active PRS should be retained for further evaluation based on the following deficiency.*

Comment 2.c.ii(1). *Page 4-67 states that "benzo(a)pyrene [which is an Appendix viii constituent]...is retained as a COPC..." however, page 4-69 states that "...no COPCs...were retained..." LANL must clarify this issue and revise the text as necessary.*

LANL Response:

The following information will be used to revise the text in Section 4.2.2, and revised text will be submitted by July 15, 1997.

Benzo(a)pyrene was qualified as "undetected-estimated" (UJ) in the surface soil because of a problem with the blind QC sample that resulted in the data being biased low and was retained as a COPC because the detection limit was greater than the SAL. Its presence in the surface soil was deemed possible because the outfall receives discharge from a combined industrial sewer and drain, which drains the asphalt roof of the building as well as the floors and sinks from Building TA-18-116 (Criticality Area 3). Based on available site information (LANL 1993, 1085; Paxton 1978, ER ID No. 5716) and the chemical inventory for TA-18, no materials were used that would have resulted in polycyclic aromatic hydrocarbons (PAHs) being released at this site. Because no other source of benzo(a)pyrene, except the runoff from

the asphalt roof, is present at this PRS, this non-PRS-related activity is the presumed source and benzo(a)pyrene is eliminated as a COPC. (See response to Comment 1.b.iv for more discussion and list of references regarding sources of PAHs.)

Bis(2-chloroethyl)ether was eliminated from further consideration because it was not likely to be present as a result of site activities. Based on the "Handbook of Environmental Contaminants: Guide for Site Assessment," (Shineldecker 1992, ER ID No. 55587), bis(2-chloroethyl)ether is an organic solvent used in a variety of processes. The only process listed that would be relevant at this site is its use in tar processing. Therefore, it may be present in minute quantities as a result of the runoff from the asphalt roofs and can be eliminated as originating from a non-PRS-related activity.

References:

LANL (Los Alamos National Laboratory), May 1993. "RFI Work Plan for Operable Unit 1093," Los Alamos National Laboratory Report LA-UR-93-422, Los Alamos, New Mexico. (LANL 1993, 1085)

Paxton, H. C., March 1978. "Thirty Years at Pajarito Canyon Site," Los Alamos Scientific Laboratory Report LA-7121-H, ER ID No. 5716, Los Alamos, New Mexico. (Paxton 1978, ER ID No. 5716)

Shineldecker, C. L. 1992. Handbook of Environmental Contaminants: A Guide to Site Assessment, ER ID No. 55587, Lewis Publishers, Chelsea, Michigan. (Shineldecker 1992, ER ID No. 55587)

2.c.iii Section 4.2.3 18-012(b) Outfall: *This non-HSWA active PRS should be retained for further evaluation based on the following deficiencies:*

Comment 2.c.iii(1). *LANL compares COPCs which are greater than SALs to industrial PRGs. LANL must compare COPCs which exceed SALs to USEPA Region IX residential PRGs, or when PRGs are unavailable, SALs calculated from Subpart S guidance. See comment 1.a.v.*

LANL Response:

The reported analyte concentrations were initially compared to the SALs currently in use at the time of this report as required by the screening assessment methodology. Region 9 residential PRGs had not yet been accepted and adopted as SALs by the ER Project and so were not used in the screening assessment. Comparisons of analytes to the Region 9 residential PRGs will be provided as described in the response to Comment 1.a.v.

Following the SAL comparison, the COPCs retained by the screening assessment (antimony, cadmium, lead, and mercury) were compared to the calculated PRGs for a non-intrusive industrial scenario. This comparison was done in lieu of a baseline risk assessment and was done to provide an indication of whether the concentrations of these COPCs pose a potential hazard to human health, i.e., the hazard index was less than or greater than one. This is an acceptable approach for screening sites (EPA 1996, 1351). The industrial PRGs were calculated based on the equations in EPA's "Risk Assessment Guidance for Superfund; Volume 1—Human Health Evaluation Manual (Part B, Development of Risk-Based Preliminary Remediation Goals)," which was the only guidance available at this time and are based on a hazard quotient of one. The exposure parameters were either default values from RAGS, Part B or Laboratory-specific values (e.g., particulate emission factor) as presented in Appendix C of the RFI report. The comparisons found that the individual PRG values calculated by this method were greater than the maximum detected concentrations of the COPCs. Individual hazard quotients were calculated by dividing the maximum concentration of each COPC by the respective industrial PRG (EPA 1996, 1351). This resulted in individual hazard quotients less than 1.0 for each COPC (0.04, 0.11, 0.06, and 0.01 for antimony, cadmium, lead, and mercury, respectively). In addition, the cumulative hazard

obtained by adding the individual hazard quotients resulted in a hazard index of 0.2, which is below the target value of 1.0. This comparison indicates that there is no hazard to human health as a result of exposure to the concentrations of antimony, cadmium, lead, and mercury at this site.

Comparisons of COPCs (chemicals that are >SALs or retained by the multiple chemical evaluation) to the current Region 9 industrial PRGs will also be done and the estimated hazard determined. This evaluation will be made as part of replacing former SALs with new SALs based on EPA Region IX residential PRGs and submitted by July 15, 1997. See response to Comment 1.a.v.

Reference:

EPA (US Environmental Protection Agency), August 1, 1996. "Region 9 Preliminary Remediation Goals (PRGs), 1996," San Francisco, California. (EPA 1996, 1351)

Comment 2.c.iii(2). *LANL must provide supporting documentation to support the elimination of COPCs based on the presence of potential alternate source(s). See comment 1.b.iv.*

LANL Response:

The following information will be added to the text in Section 4.2.3.3.4 to support the elimination of COPCs. The revised text will be submitted to HRMB by July 15, 1997.

The outfall at PRS 18-012(b) receives discharge from several sources including floor drains, sinks, a welding quench tank, and runoff from the asphalt and tar roofs (LANL 1993, 1085; LASL 1955, ER ID No. 14744). Because the only likely source of PAHs is the runoff from the asphalt roofs, a non-PRS-related activity, the PAHs detected at the outfall are eliminated as COPCs. See response to Comment 1.b.iv for more discussion and references.

References:

LANL (Los Alamos National Laboratory), May 1993. "RFI Work Plan for Operable Unit 1093," Los Alamos National Laboratory Report LA-UR-93-422, Los Alamos, New Mexico. (LANL 1993, 1085)

LASL (Los Alamos Scientific Laboratory), May 27, 1955. "Engineering Drawing ENG-C-12711, Rev. 4, Sheet 61 of 101, prepared by Skidmore, Owings, and Merrill, SFA-GJ-52-2, ER ID No. 14744, Los Alamos, New Mexico. (LASL 1955, ER ID No. 14744)

2.c.iv Section 4.2.4 18-012(c) Outfall: *This non-HSWA active PRS should be retained for further evaluation based on the following deficiencies:*

Comment 2.c.iv(1) *LANL shall conduct further investigations at this PRS to address the following concerns: obtaining one sample at the apex of the drain line is inadequate to identify a release and no samples were obtained from the nearby drainage-way.*

LANL Response:

Two samples were collected at the outfall of this drain, as indicated in Figure 4-11. The outfall consisted of a pipe, the end of which was exposed in a vertical earthen bank in the side of a drainage ditch. The drainage ditch conducts runoff from the nearby highway and frequently carries runoff water. Samples were collected from the sidewall of the ditch, directly under the pipe opening; samples collected from the bottom of the drainage ditch would not be representative of any discharge from the pipe. The drainage ditch sample was proposed in the approved RFI work plan, but this deviation from the plan was not noted

in the RFI report. The variance will be included in the text revision proposed in the response to Comment 1. c.i. However, LANL believes that the sampling was performed in the most appropriate location to bound the magnitude of any contamination resulting from discharges from the outfall and that additional sampling is not required.

Comment 2.c.iv(2). *The RFI Workplan indicates that the sump was eliminated from sampling due to the lack of contaminants of concern (process information). If no COPCs were anticipated, LANL must explain the rationale leading to the sampling of this drain line.*

LANL Response:

As explained in the RFI work plan and in Section 4.2.4 of the RFI report, there are two drains associated with this PRS—one drains the pit formerly containing an ultrasonic cleaner and the other is connected to floor drains where only potable water could have been discharged. The drain connected to equipment pit was sampled [see response to Comment 2.c.iv(1)]. As explained in Section 4.2.4., the other drain, which discharges to a dry well sump, was not sampled.

2.c.v. Section 4.2.5 18-013 Waste Tank: *This non-HSWA inactive PRS should be retained for further evaluation based on the following deficiency:*

Comment 2.c.v(1). *LANL compares COPCs which are greater than SALs to industrial PRGs. LANL must compare COPCs which exceed SALs to USEPA Region IX residential PRGs, or when PRGs are unavailable, SALs calculated from Subpart S guidance. See comment 1.a.v.*

LANL Response:

See responses to Comments 1.a.v. and 2.c.iii(1) regarding comparisons to Region 9 residential PRGs.

As described in the response to Comment 2.c.iii(1), the COPCs—benzo(a)pyrene, benzo(a)anthracene, and benzo(b)fluoranthene—retained by the screening assessment were compared to the calculated PRGs for a non-intrusive industrial scenario based on a cancer risk of 10^{-6} . This comparison was done in lieu of a baseline risk assessment and provide an indication of whether the concentrations of these COPCs pose a potential risk to human health, i.e., the cancer risk was outside of EPA's target risk range for health protectiveness of 1×10^{-6} to 1×10^{-4} (EPA 1990, 0559). This is an acceptable approach for screening sites (EPA 1996, 1351). The comparisons found that the individual PRG values calculated were greater than the maximum detected concentrations of the COPCs. Individual cancer risks were calculated by dividing the maximum concentration of each COPC by the respective industrial PRG (EPA 1996, 1351). This resulted in cancer risks less than 1×10^{-6} for each COPC (9.5×10^{-7} , 1×10^{-7} , and 1.2×10^{-7} for benzo(a)pyrene, benzo(a)anthracene, and benzo(b)fluoranthene, respectively). In addition, the cumulative risk obtained by adding the individual cancer risks resulted in an overall risk of 1.2×10^{-6} , which is at the lower end of EPA's target risk range. This comparison indicates that there is no unacceptable risk to human health as a result of exposure to the concentrations of benzo(a)pyrene, benzo(a)anthracene, and benzo(b)fluoranthene at this site.

Comparisons of COPCs (chemicals that are >SALs or retained by the multiple chemical evaluation) to the current Region 9 industrial PRGs will also be done and the estimated hazard provided. Revised text incorporating this information will be provided to HRMB by July 15, 1997.

References:

EPA (US Environmental Protection Agency), March 8, 1990. "National Oil and Hazardous Substances Pollution Contingency Plan," Final Rule, 40 CFR Part 300, Federal Register, Vol. 55, No. 46, p. 8666. (EPA 1990, 0559)

EPA (US Environmental Protection Agency), August 1, 1996. "Region 9 Preliminary Remediation Goals (PRGs), 1996," San Francisco, California. (EPA 1996, 1351)

2.c.vi Section 4.3.1 18-08 - Underground Storage Tank: *This non-HSWA inactive PRS is proposed for no further action because it could not be located.*

Comment 2.c.vi(1). *Since the completion of this RFI report, this tank has been located and is, therefore, not appropriate for NFA recommendations until investigations have been completed. The tank should be investigated and remediated under the State of New Mexico's Underground Storage Tank regulations.*

LANL Response:

As noted in the comment, this tank was located in the summer of 1996. The tank and contents were removed, soil samples collected from beneath the tank, and auger holes drilled below the former tank and around the periphery to verify the extent of petroleum hydrocarbon contamination. A report on the removal of the tank and the associated sampling was submitted to the New Mexico Underground Storage Bureau on December 4, 1996.

2.d Section 4.4 Firing Sites

2.d.i General

Comment 2.d.i(1). *LANL failed to investigate the potential for release to ground water for these sites. No attempt was made to determine if the firing sites contribute to HE concentrations in ground water.*

LANL Response:

Groundwater sampling specific to the firing site areas was not proposed in the approved RFI work plan. HE was detected in 2 of the 14 soil samples collected at PRS 18-002(a) and in 2 of the 31 samples collected at PRSs 18-002(b and c). One of the reported values at PRS 18-002(a) was slightly greater than the SAL, but less than the industrial PRG [see response to Comment 2.d.ii(4)]. HE was reported at low concentrations in 4 of the 99 soil samples collected at PRS 27-002, and all concentrations were substantially below SALs. LANL believes that these concentrations do not present an unacceptable risk to human health and do not represent a significant source of potential groundwater contamination. HE constituents were reported in samples of groundwater from background wells upgradient from TA-18 (Section 3.2.1) and in the discharge from the spring, which recharges the alluvial aquifer in Threemile Canyon (Section 4.8.3.1). Groundwater samples from the PCO wells (Section 4.7.1) and the LACEF wells (Section 4.7.2) also show concentrations of HE, but at levels comparable to that observed in the background wells. All reported values of HE constituents in groundwater (and in the water sampled in Threemile Canyon) are below the respective SAL. LANL sees no basis for extensive additional sampling to investigate the possible effect of the firing sites on groundwater. However, some additional groundwater sampling is proposed that will augment the existing knowledge, as described in the response to Comment 1.a.ii.

Comment 2.d.i(2). *LANL obtained composite samples at these firing sites. Composite samples are inappropriate for determining the nature and extent of contamination. LANL must resample these sites using discreet grab sampling methodologies. See comment 1.c.ii.*

LANL Response:

See response to Comment 1.c.ii.

Comment 2.d.i(3). *LANL's analytical laboratory consistently exceeded holding times for HE samples. LANL must resample these sites to obtain useable data.*

LANL Response:

During the time the RFI was conducted at former OU 1093, analysis of samples for HE was performed by the Laboratory's DX division. Sample through-put often fell short of demand, and samples were frequently held past the holding times specified in SW846 methods. However, samples were maintained in freezers prior to extraction and in refrigerators at 4°C in the dark prior to analysis, and it is believed that little degradation of the HE occurred after sample collection. The activities that may have introduced HE to the soil occurred in the early 1940s, and all unstable HE constituents are likely to have degraded during the 50 years elapsed time until sampling occurred. LANL has performed some specific investigations of the effects of the missed holding times on the representativeness of the analyses and has concluded that, for the instances studied, there was no significant effect. LANL will revise the text to include a detailed discussion of these investigations by July 15, 1997.

2.d.ii Section 4.4.1 18-002(a) Firing Site: *This inactive PRS is inappropriately proposed for NFA based on the following deficiencies:*

Comment 2.d.ii(1). *LANL did not ascertain if this PRS adversely impacted the ground water. See comment 2.d.i.(1).*

LANL Response:

This PRS is not inactive, it was abandoned as a firing site in the late 1940's. See response to Comment 2.d.i.(1) regarding effects of this PRS on groundwater.

Comment 2.d.ii(2). *LANL obtained composite samples for determining the nature and extent of contamination. See comment 2.d.i.(2).*

LANL Response:

See response to Comment 1.c.ii.

Comment 2.d.ii(3). *The laboratory exceeded the holding times for the HE samples. See comment 2.d.i.(3).*

LANL Response:

See response to Comment 2.d.i(3).

Comment 2.d.ii(4). *LANL inappropriately compares COPCs greater than SALs to industrial and recreational PRGs. See Comment 1.a.v.*

LANL Response:

See responses to Comments 1.a.v. and 2.c.iii(1) regarding comparisons to Region 9 residential PRGs. In Comment 1.a.v, referenced by this comment, HRMB states that LANL may present an evaluation of the risk based on the most likely exposure scenario. LANL has stipulated that the area encompassed by all PRGs at TA-18 will remain in industrial use. Some limited recreational use may be possible for some PRGs.

As described in the response to Comment 2.c.iii(1), the COPC retained by the screening assessment (nitrobenzene) was compared to the calculated PRGs for a non-intrusive industrial scenario and a recreational scenario based on a hazard index of one. This comparison was done in lieu of a baseline risk assessment and provides an indication of whether the concentration of the COPC poses a potential hazard to human health under two potential land uses. This is an acceptable approach for screening sites (EPA 1996, 1351). The comparisons found that the PRG values calculated were greater than the maximum detected concentration of the COPC. The hazard quotients were calculated by dividing the maximum concentration of nitrobenzene by the industrial or recreational PRG (EPA 1996, 1351). This resulted in hazard quotients less than 1.0 for nitrobenzene (0.04 and 0.02 for industrial and recreational scenarios, respectively). A cumulative hazard was not obtained because only one COPC was evaluated. This comparison indicates that there is no hazard to human health as a result of exposure to the concentration of nitrobenzene at this site.

Comparisons of COPCs (chemicals that are >SALs or retained by the multiple chemical evaluation) to the current Region 9 industrial PRGs will also be done and the estimated hazard provided. See response to Comment 1.a.v.

Reference:

EPA (US Environmental Protection Agency), August 1, 1996. "Region 9 Preliminary Remediation Goals (PRGs), 1996," San Francisco, California. (EPA 1996, 1351)

2.d.iii Section 4.4.2 18-002(b,c) Firing Sites, Drop Tower in Threemile Canyon: *These inactive PRGs are inappropriately proposed for NFA based on the following deficiencies:*

Comment 2.d.iii(1). *LANL did not ascertain if this PRS adversely impacted the ground water. See comment 2.d.i.(1).*

LANL Response:

See response to Comment 2.d.i(1).

Comment 2.d.iii(2). *LANL obtained composite samples for determining the nature and extent of contamination. See comment 2.d.i.(2).*

LANL Response:

See response to Comment 1.c.ii.

Comment 2.d.III(3). *The laboratory exceeded the holding times for the HE samples. See comment 2.d.i.(3).*

LANL Response:

See response to Comment 2.d.i.(3).

2.d.IV Section 4.4.3 27-002 Firing Site: *This inactive PRS is inappropriately proposed for NFA based on the following deficiencies:*

Comment 2.d.IV(1). *LANL did not ascertain if this PRS adversely impacted the ground water. See comment 2.d.i.(1).*

LANL Response:

See response to Comment 2.d.i.(1).

Comment 2.d.IV(2). *LANL obtained composite samples for determining the nature and extent of contamination. See comment 2.d.i.(2).*

LANL Response:

See response to Comment 1.c.ii.

Comment 2.d.IV(3). *The laboratory exceeded the holding times for the HE samples. See comment 2.d.i.(3).*

LANL Response:

See response to Comment 2.d.i.(3).

2.e Section 4.5 Sites with Potentially Contaminated Soil

2.e.i General

Comment 2.e.i(1). *The RFI report did not provide a "Sampling and Analysis Plan" table for the PRSs with potentially contaminated soil. LANL shall revise the RFI report to include such table.*

LANL Response:

LANL will provide the requested table by July 15, 1997.

2.e.ii Section 4.5.1 18-005(a) Magazine Site: *This inactive PRS is inappropriately proposed for NFA based on the following deficiencies:*

Comment 2.e.II(1). *LANL failed to obtain samples from within the PRS's bermed area. LANL shall obtain the additional samples.*

LANL Response:

LANL conducted the sampling at this site in accordance with the approved RFI work plan. As noted in Section 5.3.1.1.2 of the RFI work plan, the SWMU Report indicated the possible presence of contamination in the area surrounding the former location of the magazine. The immediate perimeter of the former building was, therefore, considered the most appropriate location for sampling. The berm surrounding the former location of the magazine is no longer present. As noted in the RFI work plan, there were no reports of releases from the magazine. LANL sees no basis for resampling at this site.

Comment 2.e.ii(2). *LANL sampled subsurface soils at a depth of one foot followed by a sample every other foot. LANL must explain the rationale for this sampling interval.*

LANL Response:

As described in Section 4.5.1.2, samples were collected from 0 to 12 in. No samples were collected as alluded to by the comment.

2.e.iii. Section 4.5.2 18-011 Building 18-22 Site: *This non-HSWA inactive PRS should be retained for further evaluation based on the following deficiencies:*

Comment 2.e.iii(1). *Surface soil sampling that was conducted for this PRS inadequately characterizes the site. LANL sampled the surface soils (0 to 6 inches) at the site. Since Section 4.5.2.2 states that the building's foundation is covered with approximately two feet of soil, then potential contamination is anticipated to be approximately two feet below ground surface and not in surface soils. LANL must resample this PRS at a depth corresponding with the building's foundation.*

LANL Response:

The text in Section 4.5.2.2 did not adequately explain how the sampling was conducted. Trenches were excavated to expose the edges and center of the concrete pad (there was no former building at this location). Samples were then collected from 0 to 6 in. below the former edge of the pad and on its surface. LANL believes this is consistent with that suggested by the comment and that no additional sampling is required at this PRS.

Revised text will be submitted to HRMB by July 15, 1997.

Comment 2.e.iii(2). *LANL indicates within the RFI report that the mercury spill has been remediated by the Health-Division; however, LANL does not provide supporting documentation as evidence of this remedial activity. LANL must provide this additional documentation. See comment 1.b.v, et alia.*

LANL Response:

As noted in Section 5.3.2.1.2 of the RFI work plan, no documentation of the cleanup could be obtained. The nonavailability of that documentation was the primary reason sampling was proposed at this site.

2.f Section 4.6 Storm Drains

2.f.i Section 4.6.1 18-010(b) Storm Drain Outfall: *This non-HSWA active PRS should be retained for further evaluation based on the following deficiencies:*

Comment 2.f.i(1). *LANL does not provide supporting documentation to support eliminating the COPCs based on "process information." See comment 1.b.iv.*

LANL Response:

Documentation supporting the elimination of PAHs associated with asphalt as COPCs is provided in the response to Comment 1.b.iv.

Benzo(a)pyrene and dibenzo(a,h)anthracene were qualified as UJ (undetected estimated) in the surface soil because of a QC problem with the internal standard that resulted in the data being biased low. Because of the QC problem and because the detection limits were greater than the SALs, benzo(a)pyrene and dibenzo(a,h)anthracene were retained as COPCs. Their presence in the surface soil was possible because the outfall at PRS 18-010(b) receives discharge from an asphalt paved drainage ditch, as well as runoff from the paved parking area adjacent to the ditch (LANL 1993, 1085), and because other PAHs (fluoranthene and phenanthrene) were detected. Because the only likely source of PAHs is the runoff from the asphalt ditch and the paved parking area, non-PRS-related activities, the PAHs detected at the outfall are eliminated as COPCs.

References:

LANL (Los Alamos National Laboratory), May 1993. "RFI Work Plan for Operable Unit 1093," Los Alamos National Laboratory Report LA-UR-93-422, Los Alamos, New Mexico. (LANL 1993, 1085)

Comment 2.f.i(2). *Although the RFI Workplan anticipated that solvents had been utilized at the PRS, no samples were obtained or analyzed for VOCs. LANL shall provide sampling documentation that VOCs are not present at this PRS.*

LANL Response:

Sampling at this site was in accordance with the approved RFI work plan. As explained in Section 5.4.5.1 of the work plan, VOCs could not reasonably be expected to have been retained in the sediments at these sites. LANL sees no basis for re-sampling.

2.f.ii Section 4.6.2 18-010(c) Storm Drain Outfall: *This non-HSWA active PRS should be retained for further evaluation based on the following deficiencies:*

Comment 2.f.ii(1). *LANL does not provide supporting documentation to support eliminating the COPCs based on "process information." See comment 1.b.iv.*

LANL Response:

Documentation supporting the elimination of PAHs associated with asphalt as COPCs is provided in the response to Comment 1.b.iv.

The outfall at PRS 18-010(c) receives runoff from the asphalt paved area and driveway between Buildings TA-18-30 and -31 (LANL 1990, 0145; LANL 1993, 1085). The PAHs, benzo(a)pyrene, benzo(b)fluoranthene, etc., were undetected in the surface soil, but were initially retained as COPCs because the detection limits were greater than the SALs, and PAHs may be present in the outfall because the asphalt covered areas are likely sources. However, because the sources of PAHs are from non-PRS-related activities, the PAHs presumed to be present at the outfall are eliminated as COPCs. Only those chemicals believed or suspected of being associated with a release from a PRS as a result of site activities are retained as COPCs.

Bis(2-chloroethyl)ether was eliminated from further consideration because it was not likely to be present as a result of site activities. Based on the "Handbook of Environmental Contaminants: Guide for Site Assessment," (Shinelder 1992, ER ID No. 55587), bis(2-chloroethyl)ether is an organic solvent used in a variety of processes. The only process listed that would be relevant at this site is its use in tar processing. Therefore, it may be present in minute quantities as a result of the runoff from the asphalt roofs and can be eliminated as originating from a non-PRS-related activity.

Pentachlorophenol was also eliminated because process information suggested its presence at the site was unlikely. This chemical is used as an insecticide for termite control and as a general herbicide (Budavari 1989, ER ID No. 55589) and, therefore, may be associated with maintenance activities at TA-18. Therefore, it is eliminated based on its source being a non-PRS-related activity.

References:

Budavari, S. (Ed.), 1989. The Merck Index. An Encyclopedia of Chemicals, Drugs, and Biologicals, ER ID No. 55589, 11th edition, Merck and Company, Rahway, New Jersey. (Budavari 1989, ER ID No. 55589)

LANL (Los Alamos National Laboratory), November 1990. "Solid Waste Management Units Report," Volumes I through IV, Los Alamos National Laboratory Report No. LA-UR-90-3400, prepared by International Technology Corporation under Contract 9-XS8-0062R-1, Los Alamos, New Mexico. (LANL 1990, 0145)

LANL (Los Alamos National Laboratory), May 1993. "RFI Work Plan for Operable Unit 1093," Los Alamos National Laboratory Report LA-UR-93-422, Los Alamos, New Mexico. (LANL 1993, 1085)

Shinelder, C. L., 1992. Handbook of Environmental Contaminants: A Guide to Site Assessment. ER ID No. 55587, Lewis Publishers, Chelsea, Michigan. (Shinelder 1992, ER ID No. 55587)

Comment 2.f.ii(2). *Although the RFI Workplan anticipated that solvents had been utilized at the PRS, no samples were obtained or analyzed for VOCs. LANL shall provide sampling documentation that VOCs are not present at this PRS.*

LANL Response:

See response to Comment 2.f.i(2).

2.f.iii Section 4.6.3 18-010(d) Drainage Collection Area: *This non-HSWA active PRS should be retained for further evaluation based on the following deficiencies:*

Comment 2.f.iii(1). *LANL does not provide supporting documentation to support eliminating the COPCs based on "process information." See comment 1.b.iv.*

LANL Response:

Documentation supporting the elimination of PAHs associated with asphalt as COPCs is provided in the response to Comment 1.b.iv.

The outfall at PRS 18-010(d) receives runoff from the asphalt-paved area northeast of Building TA-18-37 (LANL 1993, 1085). The PAHs, e.g., benzo(a)pyrene, benzo(b)fluoranthene, etc., were detected in the surface soil and were retained as COPCs. Because the only source of PAHs is the asphalt covered area, a non-PRS-related activity, the PAHs detected at the outfall are eliminated as COPCs. Only those

chemicals believed or suspected of being associated with a release from a PRS as a result of site activities are retained as COPCs.

Reference:

LANL (Los Alamos National Laboratory), May 1993. "RFI Work Plan for Operable Unit 1093," Los Alamos National Laboratory Report LA-UR-93-422, Los Alamos, New Mexico. (LANL 1993, 1085)

Comment 2.f.iii(2). *Although the RFI Workplan anticipated that solvents had been utilized at the PRS, no samples were obtained or analyzed for VOCs. LANL shall provide sampling documentation that VOCs are not present at this PRS.*

LANL Response:

See response to Comment 2.f.i(2).

Comment 2.f.iii(3). *Figure 4-24 does not clearly identify those areas which are paved and unpaved.*

LANL Response:

The perimeter of the paved area is indicated in Figure 4-24. However, the figure incorrectly indicates that paving extends underneath the area sampled at this outfall. LANL will revise the figure to more correctly and more clearly indicate the paved area, and submit the revision to HRMB by July 15, 1997.

2.f.iv Section 4.6.4 18-010(e) Storm Drain Outfall: *This non-HSWA active PRS should be retained for further evaluation based on the following deficiencies:*

Comment 2.f.iv(1). *LANL does not provide supporting documentation to support eliminating the COPCs based on "process information." See comment 1.b.iv.*

LANL Response:

Documentation supporting the elimination of PAHs associated with asphalt as COPCs is provided in the response to Comment 1.b.iv.

The outfall at PRS 18-010(e) receives discharge from the paved ditch as well as runoff from the asphalt paved area between Buildings TA-18-28 and -147 (LANL 1993, 1085). The PAHs, e.g., benzo(a)pyrene, benzo(b)fluoranthene, etc., were detected in the surface soil and were retained as COPCs. Because the only source of PAHs is the runoff from the paved ditch and the asphalt covered areas, non-PRS-related activities, the PAHs detected at the outfall are eliminated as COPCs. Only those chemicals believed or suspected of being associated with a release from a PRS as a result of site activities are retained as COPCs. See response to Comment 1.b.iv for more discussion and references.

Reference:

LANL (Los Alamos National Laboratory), May 1993. "RFI Work Plan for Operable Unit 1093," Los Alamos National Laboratory Report LA-UR-93-422, Los Alamos, New Mexico. (LANL 1993, 1085)

Comment 2.f.iv(2). *Although the RFI Workplan anticipated that solvents had been utilized at the PRS, no samples were obtained or analyzed for VOCs. LANL shall provide sampling documentation that VOCs are not present at this PRS.*

LANL Response:

See response to Comment 2.f.i(2).

Comment 2.f.iv(3). *Sample locations 18-1732 and 18-1733 as shown on Figure 4-25 indicate "(BCP)" and "(BaP)," respectively. LANL must clarify what these notations mean.*

LANL Response:

BaP refers to benzo-a-pyrene. BCP is a typographical error and should have been BaP. LANL will correct the figure, provide a legend explaining the acronym, and submit the revision to HRMB by July 15, 1997.

Comment 2.f.iv(4). *LANL must indicate the name of the creek the outfall drains into.*

LANL Response:

The drain discharges to the channel of the ephemeral stream in Pajarito Canyon. That information is clearly provided on the figure, and LANL sees no reason to revise the figure.

Comment 2.f.iv(5). *When describing locations in the text, LANL must use reference points clearly located on the corresponding figure. For example, Building 18-30 is cited in the text, but is not located in the corresponding figure, Figure 4-25. LANL must revise the text accordingly.*

LANL Response:

The text incorrectly references Building TA-18-30 and Figure 4-20 and contains other typos. The first two sentences in Section 4.6.4 are revised to read: **PRS 18-010(e) is the storm drain outfall of a paved ditch that serves the area northeast of Building TA-18-28 (Figure 4-25). A pipe, located at the east end of the ditch, passes under the paved area west of Building TA-18-129 to a grating east of Building TA-18-190 and turns south. All buildings referred to in the revised text are indicated in Figure 4-25.**

2.f.v Section 4.6.5 18-010(f) Storm Drain Outfall: *This non-HSWA active PRS should be retained for further evaluation based on the following deficiencies:*

Comment 2.f.v(1). *Although the RFI Workplan anticipated that solvents had been utilized at the PRS, no samples were obtained or analyzed for VOCs. LANL shall provide sampling documentation that VOCs are not present at this PRS.*

LANL Response:

See Comment 2.f.i(2).

2.g Section 4.7 Groundwater Sampling

2.g.i General

Comment 2.g.i(1). *Drill logs, well construction, and sampling methodology are not presented in the RFI report. LANL must provide this information within the RFI report. See comment 1.b.i.*

LANL Response:

See response to Comment 1.b.i.

Comment 2.g.i(2). *Available historical ground water data obtained from nearby wells, springs, and seeps should be included in the evaluation of this technical area.*

LANL Response:

The scope of the investigation reported in the RFI report for former OU 1093 did not include investigation of nearby wells and springs, except for those included within the boundaries of the operable unit. The additional investigations proposed in the response to Comment 1.a.ii will address this comment.

Comment 2.g.i(3). *The statement that "No significant additional input is occurring within TA-18..." is an improper statement to make in this RFI report. The lack of understanding of the modes of ground water occurrence and the interplay of these modes, coupled with the lack of sufficient monitoring wells, makes such a statement tentative at best. The affect TA-18 has had and continues to have on the ground water cannot be determined with confidence at this time.*

LANL Response:

The objectives of the RFI did not include complete characterization of groundwater within Pajarito Canyon. Additional information related to this issue will be addressed by investigations proposed in the response to Comment 1.a.ii. However, the data from this RFI indicate that concentrations of potential contaminants detected within and upgradient from TA-18 are generally at lower concentrations in the downgradient PCO wells. This fact supports the statement that no significant input is occurring within TA-18.

Comment 2.g.i(4). *LANL does not specify the objectives of the ground water sampling. From that standpoint, it is difficult to derive the value from the investigation as it relates to TA-18. LANL must provide language which defines the objectives of the ground water sampling so that a proper review of the information can be made.*

LANL Response:

The objectives of the RFI sampling are given in Section 5.6.3 of the RFI work plan. LANL will summarize these objectives, consistent with guidance in the approved RFI report framework policy, amend the text of Section 4.7.1 of the RFI report, and submit the revisions to HRMB by July 15, 1997.

2.g.ii Section 4.7.1 PCO Wells

Comment 2.g.ii(1). *Section 4.7.1.1: As mentioned, the PCO-series wells have been monitored on an annual basis as part of the Environmental Surveillance program. Presumably, additional analytical data is available from these previous sampling events. LANL must present the historical data for these wells within this RFI report to provide a more complete synopsis of ground water degradation near TA 18.*

LANL Response:

A more thorough discussion of historical data for the PCO series wells will be included in a plan for additional groundwater investigations proposed in the response to Comment 1.a.ii.

Comment 2.g.ii(2). *Section 4.7.1.3.1, Inorganics: LANL must revise the text to indicate which samples exceeded holding times. It is recommended that the corresponding figures also somehow indicate which samples exceeded holding times.*

LANL Response:

The samples that exceeded holding times for inorganics (mercury only) are listed in Table 4-75. LANL will revise the text of Section 4.7.1.3.1 to include a reference to that table, and submit the revision to HRMB by July 15, 1997. The designation of samples exceeding holding times on figures is not presently required by the approved RFI report framework policy.

Comment 2.g.ii(3). *Section 4.7.1.3.1, Organics: The text does not indicate which samples had detectable concentrations of 1,3-dinitrobenzene (DNB) and octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX). LANL must revise the text to show these corrections.*

LANL Response:

As stated in Section 4.7.1.3.1, these constituents were at concentrations below the site-specific background ground water concentrations listed in Table 3.2.1 of the RFI report. Consistent with the approved RFI Framework Policy, the data comparison tables, text, and the figures only address potential contaminant concentrations above background. Concentrations of these constituents are provided in Appendix D.

Comment 2.g.ii(4). *Section 4.7.1.3.1, Organics: LANL does not provide supporting documentation necessary to eliminate the COPCs based on the contaminants relative insolubility in water. See comment 1.b.iv.*

LANL Response:

Three organics were reported as nondetects, but QC problems resulted in the reported concentrations being suspect. They could not be eliminated as COPCs because the respective SALs are below the normal detection limits. Insufficient information is available to substantively prove that these suspected contaminant were not present in the samples or that they could not be in some way derived from TA-18 activities. The RFI report only concluded that it was unlikely. Additional sampling of the PCO wells is planned as part of a broader investigation of groundwater in Pajarito Canyon (see response to Comment 1.a.ii). The presence or absence of these contaminants will be addressed by that sampling.

2.g.iii Section 4.7.2 LACEF Monitoring Wells

Comment 2.g.iii(1). *Based on the primary objective of this RFI report (which is to investigate those PRSs located at TA 18), ground water monitoring wells should also be located near the drain field at 18-003(b) or southeast of Buildings 18-168 and 18-23.*

LANL Response:

The LACEF monitoring wells are located southeast of Building TA-18-168, as recommended by the comment. Also as recommended by the comment, two monitoring wells—18-1135 and 18-1136—were located adjacent to the drainfield at PRS 18-003(b). However, the text in Section 4.7.2 did not adequately cross-reference the discussion of these latter wells in Section 4.1.1. The text will be revised and submitted to HRMB by July 15, 1997.

Comment 2.g.iii(2). *Ground water from sample location 18-1135 was obtained during the investigation of 18-003(b), but was not analyzed for high explosives. All groundwater wells within this vicinity should also be analyzed for HE using SW 846 Method 8330 to provide a comprehensive site-wide survey of these constituents and to determine if these PRSs may have contributed to the overall degradation of the alluvial groundwater system.*

LANL Response:

High explosives are not a potential contaminant for PRSs 18-003(a and b), although samples from the nearby LACEF wells were analyzed for HE. The analysis of samples from selected existing and future monitoring wells will be included in the sampling plan indicated in the response to Comment 1.a.ii.

2.h Section 4.8 Wetlands

Comment 2.h.i. *Section 4.8.2, Field Investigation: Based on drill log and water chemistry data, Springs 3A and 3B are suspected of discharging from the volcanic units of the Tshirege Member of the Bandelier Tuff. Since these springs feed into the alluvial deposits and wetlands of Threemile Canyon, background samples obtained from these wetlands (WL-1 and WL-3) may not be truly representative of background alluvial conditions. LANL shall investigate the springs and seeps which may contribute contaminants to the alluvial aquifer in Pajarito and Threemile Canyons and LANL shall investigate the alluvial conditions upgradient of the influence of these springs, including TA-18 spring.*

LANL Response:

These springs and seeps will be included in the investigation proposed in the response to Comment 1.a.ii.

Comment 2.h.ii. *Figure 4-30, page 4-187 and associated text: If potential sources are located upstream of TA-18 in Pajarito Canyon, LANL shall obtain, where possible, background wetlands samples from Pajarito Canyon upgradient of its confluence with Threemile Canyon.*

LANL Response:

Wetlands in Pajarito and Threemile canyons sampled by this RFI occur in locations with perennial streamflow or where the water table is close to or at the surface. Wetlands have not been observed close to TA-18 upgradient in Pajarito Canyon. However, collection of possible additional background data pertinent to wetlands will be included in the sampling proposed in the response to Comment 1.a.ii.

Comment 2.h.iii. *Table 4-81, page 4-195: Site-wide background values (as represented by the UTL) should also be provided for comparison purposes. See comments 1.b.ii and 1.b.iii.*

LANL Response:

At the time the RFI report was written, site-wide UTL values for sediments were not available. However, these data are now available and will be included in an evaluation of the significance of use of the new UTLs. See response to Comment 1.a.iv.

Comment 2.h.iv. Section 4.8.2: An evaluation of historical information, such as aerial photographs, should have been used to determine if the drainage and wetlands were present at the time of potential contaminant discharge. From the information provided, it is uncertain whether the background samples obtained for this RFI report are unbiased representations of the wetland/alluvial conditions in the canyon. LANL shall provide an evaluation of the historical information to determine if these locations were suitable to meet the objectives of this RFI.

LANL Response:

LANL will evaluate the representativeness of the background wetland locations as part of the investigations proposed in the response to Comment 1.a.ii.

Comment 2.h.v. Section 4.8.3.4. paragraph 1: The following statement is misleading and inappropriate for a RFI report: "Because the concentrations either were less than the SALs or did not have a SAL; human health risk is not a concern." This statement leads the reader to believe that a health risk is not a concern. The evaluation of risk to human health and the environment is paramount to our mission as environmental professionals. The statement intends to say that the concentrations were such that a risk assessment was unnecessary. LANL shall revise the statement to read "Because..., human health risk was not evaluated."

LANL Response:

LANL acknowledges that the referenced statement could be misinterpreted. The last sentence of the first paragraph of Section 4.8.3.4 is revised as follows:

~~Because the concentrations either were less than the SALs or did not have a SAL; human health risk is not a concern~~ potential contaminants at this location do not present an unacceptable risk to human health.

Comment 2.h.vi. Figure 4-33, page 4-190: Does not include a notation that o-nitrotoluene exceeded background concentrations at sample location 36-2001, sample identification AAA5902, as shown in Table 4-83 on page 4-196. LANL shall revise the text and figure, as necessary.

LANL Response:

The figure will be revised as recommended by the comment, and submitted to HRMB by July 15, 1997.

Comment 2.h.vii. Section 4.8.4, Human Health Risk: 2,4,6-trichlorophenol was identified as being a COPC unrelated to activities conducted at TA-18. It is unclear if an evaluation was performed to determine if this constituent is attributable to other LANL-related activities. The question of attribution must be evaluated on a site-wide or systemic basis. LANL shall clarify this issue.

LANL Response:

The wells drilled as part of the RFI at former OU 1093 were all drilled to monitor potential effects of sanitary waste systems on groundwater. The location of each well was intended to focus on the possible effects of a specific PRS. Sampling of those wells considered the potential contaminants from that PRS, as opposed to those of nearby (or in the case of firing sites, surrounding) PRSs. Thus, a discussion of the analytical data from a particular well is primarily applicable to the adjacent septic system. LANL questions the added value of presenting information on sampling points not specific to the particular PRSs represented in a particular figure. However, LANL will review the figures in Chapter 4 of the RFI report and add the locations of any monitoring wells within the limits of the figure. The scale of all figures addressing particular PRSs does not allow the presentation of all wells within one mile of a PRS or within the canyon.

Revised figures will be submitted to HRMB by July 15, 1997.

Comment 2.I.iii. *The RFI report incorrectly states that "...no perched aquifers have been observed between the shallow alluvial aquifer and the main aquifer..." LANL shall revise this statement or strike it from the report. The following items directly conflict with the previous statement:*

- *Springs 3A, 3B, and TA-18 appear to discharge from a perched zone within the Tshirege Member of the Bandelier Tuff; and*
- *during the drilling of PM-2 a perched, saturated zone within the Otowi Formation was encountered at an elevation of 6380 feet (approximately 500 feet above the regional aquifer).*

LANL Response:

The springs referred to, as noted in the comment, issue from a geologic unit that is physically above the alluvial aquifer in Pajarito Canyon; these are not evidence of a perched aquifer below the alluvial aquifer. LANL recognizes that zones of possible saturation were encountered in the drilling of well PM-2 and of Seismic Hazard Borehole (SHB) 4, located near and within TA-18, respectively. These zones are not necessarily indications of a perched aquifer below the alluvial aquifer in the vicinity of TA-18, but it is appropriate that this information be included in the RFI report. The report acknowledges, in Figure 2-1 and Section 2.42, the potential for downward percolation of water from the alluvial aquifer. LANL will revise the text of Section 2.4.2 to describe the possible zones of saturation observed in PM-2 and SHB-4. Revised text will be submitted by July 15, 1997.

The investigation of the possible presence of a perched zone between the alluvial aquifer and the main aquifer in the vicinity of TA-18 is included in the Hydrogeologic Workplan (LANL 1996, 1378).

Reference:

LANL (Los Alamos National Laboratory), December 6, 1996. "Hydrogeologic Workplan," Revision 1.0, Los Alamos National Laboratory Report, ER ID No. 55430, Los Alamos, New Mexico. (LANL 1996, 1378)

Comment 2.I.iv. *Page B4, paragraph 6: "Groundwater elevations were measured ...in the PCO well." LANL shall clarify which PCO well is referred to and revise the text accordingly.*

LANL Response:

The report contains a typographical error in the referenced paragraph. Water level elevations were measured in all PCO wells. The sentence is revised to read:

Groundwater elevations were measured periodically. . . and prior to that in the PCO wells.

Comment 2.i.v. Water Chemistry: The general chemistry analytical results should be summarized and compiled into a table for easy reference and readability. A table would eliminate the burden on the reader to discern which constituents were below detection limits, what those detection limits were, why the PCO-2 well does not have a corresponding Stiff diagram, and why there is no cation/anion balance for PCO-3 on page B-6. LANL shall make revisions to address this comment.

LANL Response:

The general chemistry analytical results are provided in Appendix D. However, to enhance readability, LANL will prepare a table compiling the results used for preparing Stiff diagrams. LANL believes that the Stiff diagrams and presentation of charge balance calculation are the optimum way to summarize the general chemistry results. The tabulation of the charge balance on Page B-6 contains a typographical error—PCO-2 should be PCO-3. The text in the middle paragraph on that page correctly notes that insufficient data are available to prepare a Stiff diagram (and by extension, calculate the charge balance) for well PCO-2. LANL will correct the text. LANL is uncertain what the comment refers to regarding constituents below detection limits. All data used in discussing the general chemistry are for detected constituents.

Revised text and tables will be submitted to HRMB by July 15, 1997.