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PETER MAGGIORE  
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1020-1-21/12/99/11

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

August 9, 1999

Mr. Theodore Taylor, Project Manager  
Los Alamos Area Office  
Department of Energy  
528 35<sup>th</sup> Street, Mail Stop A316  
Los Alamos, New Mexico 87544

Dr. John Browne, Director  
Los Alamos National Laboratory  
P. O. Box 1663, Mail Stop A100  
Los Alamos, New Mexico 87545

**RE: Request for Supplemental Information  
21-029 RFI Work Plan, Vol. II  
Los Alamos National Laboratory  
NM0890010515**

Dear Mr. Taylor and Mr. Browne:

The Department of Energy (DOE) Corrective Action Section of the New Mexico Environment Department's Hazardous and Radioactive Materials Bureau has reviewed the 21-029 RCRA Facility Investigation (RFI) Work Plan, Vol. II (LA-UR-98-4169), dated October 1998 and requests supplemental information as detailed in the attachment.

Los Alamos National Laboratory must respond to the request for supplemental information within thirty (30) calendar days of receipt of this letter.

Should you have any questions or require additional assistance regarding this request, please feel free to contact Mr. John Kieling, LANL Project Leader at (505) 827-1558 extension 1012 or Ms. Victoria Maranville at (505) 827-1558 extension 1044.

Sincerely,

John E. Kieling  
LANL Project Leader  
RCRA Permits Management Program  
Hazardous and Radioactive Materials Bureau

TV



10542

JEK:vm

attachment

cc w/ attachment:

J. Canepa, LANL EM/ER, MS M992  
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P. Young, NMED HRMB  
File: Reading and HSWA LANL 1/1106/21/21-029

## ATTACHMENT

### General Comments:

1. Information regarding fracture-flow at this potential release site (PRS) is unknown. Every attempt should be made to characterize nature and extent of subsurface contamination related to fractures, during this phase of investigation (if possible) to eliminate the need to remobilize and conduct additional field work which could have been conducted during this phase of investigation. Please submit a Sampling and Analysis Plan (SAP) to further investigate subsurface contamination related to fractures, the role in the transport of contaminants along fractures, and the impact of fracture flow on contaminant transport at this PRS.

The following sections in the RFI Work Plan Vol. II make assumptions regarding the composition of the fracture-filling material, the role in contaminant transport along fractures, and the impact of fracture flow on contaminant transport. Fracture-filling materials have not been studied or evaluated at this PRS, and therefore, assumptions regarding the influence of fracture-filling material on contaminant transport can not be made:

**A. § 2.2.1.1 Nonsampling, Fractures at TA-21, page 2-19**

*“...If this is correct, a contaminant plume migrating downward along fractures from the West Fill Station might be expected to intersect the upper DP Canyon drainage to the north of the DP Tank Farm. The study did not consider the possible influence of fracture-filling materials on contaminant migration in this area; however Davenport et al. (1995, 58847) note that the filling of surficial fractures in the tuff by swelling clays (smectites) tends to clog the fractures, reducing their ability to transport water (and fluids in general).”*

In addition, the above-referenced statement only refers to potential releases from the West Fill Station and does not take into account a release from other portions of this PRS.

**B. § 2.2.2.3 Media Characterization, page 2-72**

*“ It may be that fractures are observed to be contaminated, but on unfractured tuff material no contamination is visibly evident or measured with the PID. If this is the case, this sampling activity will be suspended and the alternatives considered based upon field observations.”*

2. The use of photoionization detector (PID) readings to guide sample collection for laboratory analysis may not be appropriate for the following reasons: based on the information provided, the contamination at this PRS is largely related to “weathered or degraded” petroleum products, as a result the volatile portion of the hydrocarbons may not be present; heavier-end hydrocarbons are not as volatile as the gasoline-range organics and, are therefore less likely to be detected using a PID; and kerosene, which was indicated as a potential contaminant of

concern, is not generally detected using a PID. Please include criteria for sample collection based on visual inspection and best professional judgement (i.e., presence of fractures, odor, staining, weathering and/or sheen). Please provide detailed information on the proposed screening instrument, more specifically, demonstrate the screening instrument is capable of detecting the presence of heavy end hydrocarbons (motor oil range), diesel range constituents, weathered petroleum hydrocarbons, and kerosene.

3. Vapor sampling methods using a PID are proposed in § 2.2.2.3 Media Characterization (page 2-74) to attempt to determine source and/or subsurface areas of contamination. The following comment is directly related to the proposed options for vapor sampling and Activity 5:

Collecting vapor samples using a PID may not yield favorable or representative results for the following reason: PID sampling of the vapors contained in the boreholes may not be the best method to detect the presence of heavy end hydrocarbons (motor oil range), diesel range constituents, weathered petroleum hydrocarbons, and kerosene. In addition, collecting samples using a vacuum method on the sealed borehole and then obtaining headspace may not yield favorable or representative results for the same reason stated above. The use of passivated canisters would be more favorable than the above described methods, assuming the auger holes are of a sufficient depth to encounter fractures (and organic vapors) and the samples collected are analyzed for the proper constituents. Based on the available information, HRMB is of the opinion that the most favorable method of collecting subsurface vapor samples to determine source(s) or areas of highest subsurface contamination is by using an adsorbent material (such as active, passive, and flux chamber soil vapor surveys using EPA endorsed methods) in a sealed hole which is allowed to equilibrate for specified period of time and then sent to a fixed laboratory for analyses of the targeted constituents.

4. Characterization and assessment of the site must be conducted in accordance with RCRA and not in accordance with the New Mexico Environment Department (NMED) Underground Storage Tank (UST) Regulations. Please note, analysis for total BTEX (as indicated in § 1.1 **Objectives and Scope, page 1-7** of the RFI Work Plan, Vol. II) is not appropriate for RCRA characterization. Analyses for BTEX constituents should be conducted for the individual hazardous constituents using the appropriate VOC analysis. In addition, no further action (NFA) (under NFA Criterion 3: The site was characterized and/or remediated under a different authority) is not applicable for this site because the release of hazardous wastes or hazardous constituents is from a solid waste management unit (SWMU) listed on the facilities Hazardous and Solid Waste Act (HSWA) permit Module VIII.
5. Due to limited background information relating to past operational history, to the exact type of product stored at the tank farm during the period of operation, and since data from the site decommissioning was inconclusive with respect to the potential for contamination, full suite analyses including sampling and analysis for kerosene (using EPA Method 8015 for non-halogenated volatile organics or equivalent method), organics (volatile and semivolatile), radionuclides, polychlorinated biphenyls (PCBs) and metals should be conducted on samples collected during the investigation of this PRS. In addition, total petroleum hydrocarbons (TPH) for diesel range organics (DRO) is also recommended since analyses for TPH has been

conducted during past investigations, and the results would be useful to compare and establish trends in TPH concentrations.

Analyses for kerosene is required due to the fact it was indicated as being stored at the tank farm during the period of operation. Organic analyses are required for the detection of volatile and semivolatile constituents associated with diesel, gasoline, and jet fuel stored at the tank farm, as well as, possible solvents. PCBs analyses are required due to the fact that some heavy end oils (transformer oil) have historically contained PCBs.

Radionuclide analyses should be included for the following reason: Thirteen of the 31 samples collected from DP Tank Farm exhibited elevated concentrations of radionuclides (americium-241, cobalt-60, cesium-137, and uranium-235). The presence of radionuclides can not be ruled out based on historical knowledge since the exact contents of the tanks, during the entire period DP Tank Farm was operational, is unknown.

Metals analyses should be included because process knowledge has been shown to be unreliable and metals are associated with petroleum sites and, some elements are elevated depending on the background medium to which they were compared (page 2-29). Based on this information, sufficient evidence does not exist regarding medium identification and background values used to eliminate inorganic constituents from the investigation.

Sections in the RFI Work Plan Vol. II indicate the possibility of contamination at this PRS that is not petroleum-related, further illustrating the need for full suite analyses to characterize the site. The following sections of the RFI Work Plan, Vol. II indicate the potential for contamination at the site which is not petroleum-related:

**A. § 2.1.2 Operational History, Potential Release Site 21-029, DP Tank Farm, Page 2-10**

*“ However, given the nature of historical operations, it is possible that low levels of metals, particularly lead, might be present at the site.... Francis (1993, 58986) also recalled cleaning solvent being distributed from the tank farm at times ”*

**B. § 2.2.1.2 Sampling, Background Comparisons and Screening Assessment of Data Collected in the 1994 RFI, Inorganics, page 2-30**

*“ The data presented do not indicate that inorganic constituents are present at levels greater than background at the DP Tank Farm site, with the possible exception of concentrations of lead in the subsurface that might be slightly greater than background. ”*

**C. § 2.2.1.2 Sampling, Background Comparisons and Screening Assessment of Data Collected in the 1994 RFI, Radionuclides, page 2-33**

*“ Only americium-241, cobalt-60, cesium-137, and uranium-235 were detected. Background data only exists for three radionuclides from this suite (cesium, americium, and uranium), and*

*the background data sets for americium and uranium are based on alpha spectroscopy analysis.”*

**D. § 2.2.2.1 Nature and Extent of Contamination, page 2-62**

*“ There are also the potential for the presence of low levels of lead contamination and a smaller possibility of the presence of other metals above background on the meas top in the area of the tank farm.”*

**E. § 2.2.2.1 Nature and Extent of Contamination, page 2-62**

*“3. Inorganic chemicals have been identified at concentrations possibly above background values in soils/tuff at DP Tank Farm.”*

The following sections of the RFI Work Plan, Vol. II propose sampling for specific constituents and not full suite analyses. LANL should amend the following sections to include full suite analyses:

**A. § 2.2.3.2 Media Characterization, page 2-69**

*“ Samples will be submitted for inorganic chemical, BTEX, SVOC, and TPH as diesel and motor oil range organic chemicals.”*

**B. § 2.2.2.3 Media Characterization, page 2-71**

*“ The samples collected will be analyzed for inorganic chemicals, BTEX, SVOCs, and both diesel range and motor oil range hydrocarbons.”*

6. The proposed auger and borehole sampling of the surface and near surface soils at DP Tank Farm, and in DP Canyon, and the hydrocarbon sheen area may not define soil contamination at depth associated with the former tank farm activities conducted at this PRS. Numerous shallow auger samples are proposed which correspond with former drain lines, fill ports, valve boxes, former berm, and inlet and locations below the outfall of each drain pipe.

The auger samples proposed are shallow and may not be deep enough to define the vertical extent of soil contamination at this PRS, specifically in the vicinity of the former East and West Fill Stations. At the former West Fill Station, results of the 1995 UST investigation indicate that the vertical extent of soil contamination had not been defined. At the former East Fill Station, results of the 1996 voluntary corrective action (VCA) indicate soil samples containing total petroleum hydrocarbon (TPH) were found approximately 15 to 32 feet below the ground surface. TPH concentrations at the former East Fill Station ranged from 1,300 parts per million (ppm) at an approximate depth of 15 feet below the ground surface (Sample 0121-96-0027 collected from the bottom of the southern portion of the excavation) to 6,100 ppm TPH (Sample 0121-96-0042 collected from the bottom of the northern portion of the excavation) at an approximate depth of 32 feet below the ground surface.

HRMB provides the following comments to the proposed auger and boring installation plan in an attempt to define vertical extent of contamination:

- A. Sampling frequency located along the former berm should be reduced because the berm has been removed and used as backfill material. Because the berm was not believed to be constructed to contain a catastrophic release, and therefore, significant soil contamination is not expected to be related to this structure, therefore soil sampling along the berm could be reduced to a minimum of four auger holes (as opposed to the nine which are proposed); and
- B. Nine shallow auger fill port samples are proposed along the fence adjacent to DP Road. The proposed fill port samples are located extremely close together. For example, sample locations 5 and 8 appear to be located within five feet of one another, and locations 17 and 11 are also within five to seven feet of one another. Because these locations are in close proximity to one another, HRMB believes they could be combined without detracting from the objectives of the work plan.

In addition, sample location 3 (which is located approximately 12 feet west of sample location 17) and sample location “?” (which is located 15 feet east of sample location 8) could also be combined. HRMB recommends reducing the number of samples along the former fill ports from nine to five.

### **Specific Comments**

#### **1. § 1.0 Introduction, page 1-1**

*“Structures at DP Tank Farm site consisted of fuel tanks, fill ports, valve boxes, the East and West Fill Stations, access roads, a large berm on the north side of the site extending from just east of the West Fill Station to the east end of the site, and pipes that drained into outfalls on the north-facing slope of DP Canyon. The site was decommissioned in 1988, resulting in removal of all major structures at the site (LANL 1991, 7529)..... Remnants of the drain pipe and one fill port remain at the site.”*

It is unclear if the piping to the outfalls were removed and the outfalls remediated during the 1988 site decommissioning. Please clarify if the piping to the outfalls were removed and the outfalls remediated, or if they still remain. Please submit a detailed SAP for the investigation and sampling of the outfalls and the associated drainage channel. No Further Action (NFA) can not be granted until the outfalls and drainage channels are fully characterized.

#### **2. § 1.1 Objectives and Scope, page 1-6**

*“Finally, recently available background data for geologic media at the Laboratory were used in this review as the basis for background comparisons, the results of which suggest some potential for low levels of lead contamination at the site.”*

Please provide the appropriate citation for the background data used in the review of this data.

**3. § 1.1 Objectives and Scope, page 1-7**

*“ As outlined in Section 1.1, the principle objective of these activities is to determine the extent, possible origin, and migration mechanism related to the determination of the nature and extent of petroleum hydrocarbon and inorganic chemical contamination on the mesa top.”*

In order to determine the migration mechanism, migration pathways, including fracture-flow mechanisms, must be fully evaluated. Please outline the approach or plan to be implemented to address fracture-flow and other contaminant transport mechanisms at this PRS.

**4. § 1.1 Objectives and Scope, page 1-7**

*“ Activity 2 includes an initial detailed reconnaissance of DP Canyon (before sampling activities) followed by monthly to biweekly inspections of the canyon.”*

Please include what actions and activities are to be conducted during the initial detailed site reconnaissance. Please clarify the frequency of the monthly to bimonthly inspection of the canyon bottom and list the criterion for establishing inspection frequency. A detailed schedule outlining the intended plan of action and determining factors must be submitted to HRMB for review and approval prior to the implementation of this phase of work.

**5. § 1.1 Objectives and Scope, page 1-8**

*“ Activity 3 is collection and analysis of sediment samples from the channel within, upstream, and downstream of the localized hydrocarbon sheen area.”*

Please clarify the location of the sediment samples to be collected or how the locations will be selected. It is unclear if only surface sediment samples are to be collected. In order to properly characterize sediments in the canyon bottom, both surface and subsurface sediment samples, if available are required. Please submit details or site the proper standard operating procedure (SOP) regarding the proposed sample collection depth and sample collection procedures for the canyon bottom sediment sampling activities.

**6. § 1.0 Introduction, page 1-5**

*“ Because of the remediation activities at the location of the former East Fill Station, which had changed the conditions at the site, a monitoring program was established that required two years of quarterly monitoring involving visual inspections of the sheen area. The inspections over the course of the last two years has shown that the sheen area is highly variable depending on seasonal fluctuations in the weather patterns.”*

Please provide to HRMB the quarterly monitoring data collected during the visual inspection of the sheen area.

**7. § 2.1.2 Operational History, Potential Release Site 21-029, DP Tank Farm Site., page 2-9**

*“ At the time of decommissioning in 1988 the berm soils were considered to be clean and were used as backfill probably in the area of the East and West Fill Stations and the access road.”*

Please submit to HRMB information (i.e., analytical or other data) used to make the determination that the berm soils were not contaminated and suitable to be used as backfill material in the vicinity of the East and West Fill Stations and the former access road.

**8. § 2.1.2 Operational History, Potential Release Site 21-029, DP Tank Farm Site, page 2-9**

*“ The field logs of the decommissioning (McInroy 1988, 1641) mention there was not visual evidence that fuels had ever been released through the gate valve (or even that the gate valve had ever been opened).”*

Please verify if soil samples were collected in the vicinity of the former gate valve to confirm the presence or absence of soil contamination immediately down gradient from the gate valve. If soil samples were not collected in these areas, please include in the detailed SAP outlining sampling to be conducted immediately down gradient of the gate valve.

**9. § 2.1.2 Operational History, Potential Release Site 21-029, DP Tank Farm Site, page 2-10**

*“ From these reports (Bend 1980, 3688; LANL 1985, 37841) of the sampling and analyses of the tank contents, it may be concluded that...”*

The conclusions stated only discuss tank contents from 1980 to 1985 even though DP Tank Farm operated from 1946 to 1985. Please provide information on the contents of the tanks for the period of 1946 to 1980. If it is unclear or unknown what the actual contents of all tanks located on the site prior to 1980, please revise the statement to include such a lack of knowledge.

**10. § 2.1.2 Operational History, Potential Release Site 21-029, DP Tank Farm Site, page 2-11 and § 2.1.3 Waste Characterization, page 2-17**

*“ As discussed in Section 1.0 and Section 2.2.1.2 of the work plan, the results of the screening assessment for the 1994 RFI data indicated that all of the chemicals of potential concern (COPCs) present in the DP Tank Farm soils were associated with petroleum products. There was no evidence that hazardous wastes had been on the site.*

*All evidence from various maps, memorandums, and records of sampling and analysis at PRS 21-029, DP Tank Farm, and the results of all investigations conducted to date indicate that no solid wastes, and thus no hazardous wastes, were ever stored at the site. Records indicate that the 15 tanks contained only petroleum products including leaded and unleaded gasoline, diesel, kerosene, and No. 2 fuel oil.... And as noted in earlier sections, Francis (1993, 58986 and 58987) also recalls Stoddard solvent (mineral spirits or petroleum distillate) being distributed at the tank farm at times.”*

Please provide to HRMB the data and documentation or evidence (i.e. maps, memorandums, and records of sampling and analysis) used to support the above-referenced statements. Information regarding the exact contents of each of the tanks at the site for the period 1946 to 1980 is unknown. Please provide documentation to support hazardous wastes have not been stored on the site during the entire period of operation. The above-referenced statements contradict the statement in § 2.1.2 Operational History, page 2-10, which indicates that the contents of the tanks during the period of operation (1946-1985) cannot be determined.

**11. § 2.2.1 Existing Data, page 2-18**

*“ Section 2.2.1.2, Sampling discusses data collected at DP Tank Farm Site and surrounding areas.”*

The use of the term “surrounding areas” implies off-site investigation and sampling. Please clarify the “surrounding areas” to be investigated. (If the term applies to DP Canyon and the hydrocarbon sheen area, these are not considered by HRMB to be “surrounding areas”, but part of 21-029.)

**12. § 2.2.1.1 Nonsampling, Fractures at TA-21, page 2-18**

*“ An extensive field survey of fractures in the Bandelier Tuff at TA-21 was conducted in 1992. Wohletz (1995, 54404) measured strike, dip, and aperture for a total of 1662 fractures in Unit 2 of the Tshirege Member of the Bandelier Tuff (Qbt2) exposed on cliff below TA-21 in Los Alamos Canyon.”*

Please provide a detailed map that illustrates the relationship and distance between the field survey study area and this investigation. The locations of faults in the area and the fracture study conducted at DP Tank Farm (Wohletz 1995, 58845) should be provided graphically.

**13. § 2.2.1.1 Nonsampling, Other Site Information, page 2-19**

*“ A preliminary ecological screening assessment for OU 1106 conducted in 1994 found that PRS 21-029, DP Tank Farm, is a mesa top site surrounded by disturbed areas. The area provides limited habitat for biota, does not contain sensitive habitats, and threatened or endangered species are not present there. Therefore, there is no immediate ecological risk at this site.”*

The 1994 “preliminary ecological screening assessment” conducted for OU 1106 is not provided, although an Ecological Scoping Checklist and Ecological Pathways Conceptual Exposure Model dated July 8, 1998 is provided. Please provide the 1994 assessment for review. (The “preliminary ecological screening assessment” is also referenced in § 2.2.1.2 Summary (page 2-43) as unpublished). In addition, please reference the 1998 assessment if information contained in the assessment was used to demonstrate “no immediate ecological risk” at this PRS and in DP Canyon.

Based on information contained in the 1998 Ecological Scoping Checklist and Ecological Pathways Conceptual Exposure Model, DP Canyon, more specifically, the hydrocarbon sheen area, has not been fully evaluated. A full evaluation, including erosion potential evaluation for the residual hydrocarbon contamination in the bottom of DP Canyon must be conducted prior to assuming that “no immediate

ecological risk” exists at this PRS, the hydrocarbon sheen area, and DP Canyon reach. In addition, please define what is meant by the term “no immediate ecological risk”.

The 1998 assessment report also states that no threatened and endangered species are present in the vicinity of the tank farm or DP Canyon itself, but does not provide the documentation (specifically Bennett 1996, LA-UR-93-107) to support this statement,. Please provide any site surveys used to determine that the site does not pose an ecological risk to DP Canyon.

**14. § 2.2.1.1 Nonsampling, Other Site Information, page 2-20**

*“ A second drain about 18 inches in diameter was observed about 200 ft downstream from the 24-in. Drain. This drain also is oriented approximately north-south, but no records were found to identify it. Photographs of the 1996 VCA show several sections of partially removed drain pipe from the location of the former East Fill Station area. This is thought to be the same drain pipe.”*

Please clarify the use of the 18-inch pipe. In addition, please provide information (analytical results) regarding soil sampling activities conducted beneath the outlet, adjacent, and in the projected drainage way of the 18-inch pipe.

**15. § 2.2.1.1 Nonsampling, Surrounding Sites, Mari Mac Shopping Center, page 2-21**

*“ Potential contamination associated with the Mari Mac Shopping Center has not been documented, and no PRSs have been identified at this site (LANL 1992, 7667). However, the shopping center and surrounding commercial and light industrial areas drain into the head of DP Canyon are potential sources of low levels of contamination in DP Canyon of some metals (e.g. lead), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and other organic compounds that could be associated with town site runoff.”*

The above statement is speculative; please provide documentation to support it or remove the statement. In addition, it is stated that no contamination or PRS is associated with the Mari Mac Shopping Center. If there is no suspected contamination, how please indicate how the Shopping Center could be a possible source for contamination at DP Tank Farm and in DP Canyon, more specifically of lead, PAHs, PCBs and other organics.

**16. § 2.2.1.1 Nonsampling, Surrounding Sites, PRS 00-027, page 2-22**

*“ This site was first used as a fuel tank farm beginning in 1946 and was converted to a drum storage area in mid-1948. Potential contamination at PRS 00-027 is attributable to petroleum products leaking from storage tanks, drums, and drainlines. The potential contaminants associated with PRS 00-027 are primarily fuel products, including BTEX, as well as volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), TPH, target analyte list (TAL) metals, and pesticides/PCBs.”*

PRS 00-027 could be a possible source of contamination for DP Tank Farm and/or the hydrocarbon sheen area. Possible subsurface contaminants, primarily fuel products, associated with 00-027, could

have migrated via fracture flow onto DP Tank Farm and/or the hydrocarbon sheen area. In order to determine if 00-027 is a possible source of contamination at DP Tank Farm and/or the hydrocarbon sheen area, an understanding of fracture flow and contaminant transport via fractures in the vicinity of 00-027, 21-029, and the hydrocarbon sheen area is necessary (i.e., characterization of PRS 00-027 should be conducted).

**17. § 2.2.1.2 Sampling, Precommissioning Investigation Sampling and Analysis Activities (1984 and 1985), page 2-24**

*“ Analytical results for EP toxicity lead and arsenic, and net total organics for the surface soil and control samples, location for which are indicated by the map, are summarized in a copy of the handwritten table submitted in 1985 (LANL 1985, 37841) (provided in Appendix A-1.0 of this work plan). The results show lead and arsenic concentrations in the EP toxicity leachate of samples at below detection (<0.1 mg/L) for lead (with the same result in the controls) and up to 0.0042 mg/L for arsenic (slightly greater than the highest value in the controls)..... A memorandum attached to LANL (1985, 37841) gives the exact date of the soil sample collection as November 27, 1984, followed by collection of soil sample controls and liquid samples from the tanks on January 17, 1985. Details of the analytical results for the liquid samples are not provided.”*

The analytical method used and the laboratory analytical results for the soil samples collected is not provided in the RFI Work Plan, Vol. II. Please provide laboratory data for review along with the analytical method used. In addition, please provide the exact locations of the samples which were used as “control samples” as well as the land use history for the sampling location. It is unclear as to where the exact sampling location for the control samples is and if they were collected from an area that has not be previously disturbed. In addition, liquid samples were collected from the tanks on January 17, 1985. Based on the results of the liquid sampling, conclusions were made as to the contents of each of the tanks, however the analytical results are not provided. Please provide the analytical results for verification of the tank contents prior to the removal of the tanks.

**18. § 2.2.1.2 Sampling, Precommissioning Investigation Sampling and Analysis Activities (1984 and 1985), page 2-26**

*“ Field notebook entries on May 17, 1988 and May 25, 1988 (McInroy 1988, 1641), indicate that vapor measurements were taken during the excavation activities. No details regarding these measurements were available at the time this work plan was prepared.”*

Please provide the vapor measurements collected during the excavation activities. If these measurements can not be located, please indicate that they were collected but can not be verified.

**19. § 2.2.1.2. West Fill Station Location, page 2-43**

*“ Figures 2.2-10 and 2.2-11 indicate that the vertical extent of contamination at the location of the former West Fill Station might not have been determined. The levels detected were all below the UST thresholds of interest, and the depths of the boreholes was great enough that extent was*

*considered bounded according to the needs of the investigation. In particular, no large subsurface petroleum hydrocarbon accumulation was found."*

Please clarify the above statement by explaining if the extent of the contamination at this PRS has been determined, what "bounded according to the needs of the investigation" means, and what were the objectives of the investigation. In addition, please clarify what is meant by "no large subsurface petroleum hydrocarbon accumulation."

**20. 2.2.1.2. Summary, page 2-43**

*"The presence of petroleum hydrocarbons in the subsurface at the locations of the former East and West Fill Stations was confirmed during the 1995 UST investigation. In addition the vertical and horizontal extent of contamination at these locations appeared to be reasonably defined."*

Please clarify if the vertical and lateral extent of contamination at this PRS has been defined; the above statement is ambiguous as it is and indicates that contamination has been "reasonably defined."

**21. § 2.2.1.2. Hydrocarbon Sheen and DP Canyon Sampling and Analysis (1994-present), page 2-47**

*"The results of the 1994 RFI indicated the only contaminant source at DP Tank Farm was petroleum related products."*

This statement implies full suite analysis was conducted during the 1994 RFI at DP Tank Farm. Please verify which analytical suite methods were employed.

**22. § 2.2.1.2. Hydrocarbon Sheen and DP Canyon Sampling and Analysis (1994-present), page 2-47**

*"Because the qualitative analysis indicated a potential relationship between the localized hydrocarbon sheen area and the former West Fill Station, the DP Canyon channel was investigated in 1995 to determine if the petroleum-related products in the sheen area are associated with the petroleum-related products contamination at the location of the former West Fill Station."*

Although a relationship may exist between the West Fill Station and the hydrocarbon sheen area, the West Fill Station may not be the only source of petroleum-related product contamination. Other sources of subsurface contamination, which exist at DP Tank Farm may contribute to the contamination at the hydrocarbon sheen area. Other potential sources of contamination have not been investigated or linked to the hydrocarbon sheen area. Subsurface soil samples from the hydrocarbon sheen area were collected in April 1995 and compared to subsurface soil samples from the vicinity of the former West Fill Station. Soil samples from the former West Fill Station had been drummed for approximately one year prior to analysis, and most likely had degraded and volatilized during that period. The approach used to determine a source for the hydrocarbon sheen area implies that the West Fill Station is the only source of subsurface contamination at DP Tank Farm. Investigation of other potential sources should be included in the SAP to be submitted in response to these comments.

**23. § 2.2.1.2. VCA Confirmatory Sampling and Analysis Activities (1996), page 2-50**

*“ Samples were submitted to a fixed laboratory for analysis of BTEX by Environmental Protection Agency (EPA) SW-846 Method 8020 and TPH in the form of diesel by modified EPA SW-846 Method 8015. Sample locations are shown in Figures 2.2-12 and 2.2-13. Some of the sample analytical results were estimated data. However, the analytical results were significantly below action levels. For these reasons, the data qualifications did not affect the usability of the data.”*

Please submit to HRMB the reason analytical results for some of the samples were reported as estimated values and provide verification, including supporting documentation that the data collected is usable and of sound quality. The data tables should indicate relative bias of qualified data.

**24. § 2.2.1.2. VCA Confirmatory Sampling and Analysis Activities (1996), page 2-53**

*“ Although analytical results indicated that the cleanup level for TPH had not been met for the samples, no further removal was conducted because the small volume of contaminated material remaining was associated with staining that was observed adjacent to and along fractures (that is, the samples were biased toward stained material not bulk tuff).”*

Please indicate how the volume of contaminated soil left in place was determined. As stated earlier in the report, extent has not been clearly defined. Hence, the extent of contamination could not have been determined because the extent has not been determined. Also, the amount of contaminated material was stated to be “small”; please quantify what is meant by “small”.

**25. § 2.2.1.2. Evaluation of VCA Confirmatory Sampling and Analysis Data, page 2-50**

*“ The residual contamination is largely in the subsurface, and there is no direct pathway to receptors other than upward movement of the more volatile hydrocarbons to the surface.”*

Please substantiate or remove this statement.

**26. § 2.2.1.2. Evaluation of VCA Confirmatory Sampling and Analysis Data, page 2-53**

*“ As indicated in Section 2.1.1 (discussion of fractures), it is possible that fracture flow to the north could transport petroleum-related products to DP Canyon. However, the actual paths of the fractures is uncertain, and there are other potential sources for the localized hydrocarbon sheen area in DP Canyon. Because of the difficulty of pursuing contamination through fractured media, the objective of the next phase of investigation at DP Tank Farm is to better understand the sheen area, its extent, and the direction of its origin.”*

Sufficient evidence supporting an off-site source of contamination has not been presented. If LANL should obtain supporting documentation and analytical results indicating an off-site source of contamination HRMB will review and consider the new information. In addition, fracture flow must be investigated for this PRS and the area hydrocarbon sheen area in DP Canyon.

**27. § 2.2.1.2. Other Sampling and Analysis Data Evaluation, Previous Investigations at PRS 00-031(a), page 2-54**

*“ A GPR geophysical survey and magnetic survey were performed at the site March 20, 1993, to locate any UST or underground pipelines. The results of the survey showed that no USTs were present at the site. However, a “rubble pit” was located in the parking area northeast of the hotel lobby area (LANL 1993, 15022; LANL 1993, 15023). ”*

Please indicate if the “rubble pit” identified at 00-031(a) (Hilltop House Gasoline Station) has been investigated or is planned to be investigated and when. If 00-031(a) is to be considered as a source of potential contamination, documentation of actual contamination at the site and a graphical illustration of the subsurface plume associated with the contamination at the site must be obtained.

**28. § 2.2.1.2. Other Sampling and Analysis Data Evaluation, Previous Investigations at PRS 00-030(a), page 2-55**

*“ The method selected consisted of crushing the septic tank in place when the sample analyses and assessment confirmed that no human health risk was presented associated with COPCs at the site. ”*

Please provide the method by which COPCs were identified at this PRS. If historical records of inventory stored at this PRS were used to make the determination of potential contaminants, please provide this information to HRMB. Indicate how the “no human health risk” determination was calculated.

**29. § 2.2.1.2. Other Sampling and Analysis Data Evaluation, Environmental Surveillance Program Data Relevant to DP Canyon, page 2-56**

*“ Samples for organic analysis relevant to this work plan have been taken at DPS-1, DPS-4, LAO-2, LAO-3, LAO-3A, LAO-4 and LAO-4.5C. ”*

Please clarify the distance the samples were collected from DP Tank Farm and how the samples are relevant to the DP Tank Farm investigation. Based on the information provided in Figure 2.2-14, page 2-57, the sample locations identified (DPS-1, DPS-4, LAO-2, LAO-3, LAO-3A, LAO-4 and LAO-4.5C) appear to be located over 2,000 feet from DP Tank Farm and some are not located in DP Canyon. Also indicate how the samples were collected, bailer, bladder pump, impeller pump. (Include flow rates, field parameters used to determine stabilization, ect.)

**30. § 2.2.1.2. Other Sampling and Analysis Data Evaluation, Canyons Investigations, page 2-59**

*“ The main finding from the canyons investigations and the ESH-18 environmental surveillance data that are pertinent to the DP Tank Farm investigation are that petroleum hydrocarbons are not found downstream from the localized hydrocarbon sheen area at DP Tank Farm..... This indicated that the petroleum-related products that are in the sheen area, if they are migrating down-channel at all, are not migrating in measurable quantities. ”*

Please indicate the distance surface water samples were collected downstream from DP Tank Farm and the hydrocarbon sheen area. Petroleum-related products may be migrating downstream, but dilution may be occurring downstream of the hydrocarbon sheen area.

**31. § 2.2.2.1 Nature and Extent of Contamination, page 2-60**

*“ The stream in DP Canyon is ephemeral, flowing significantly only after heavy rains and periods of spring snowmelt. ”*

Please verify if this stream is an ephemeral stream. NMED personnel have visited the canyon on several occasions and water has been observed flowing in the canyon bottom, even when there has been no precipitation, indicating that the stream in the bottom of DP Canyon may, in fact, be perennial, flowing throughout the year.

**32. § 2.2.2.1 Nature and Extent of Contamination, page 2-61**

*“ The chromatograms indicate that the hydrocarbons in these samples can be classified as motor or lubricating oil; concentrations cannot be quantified but they are known to be low. ”*

This statement is vague and requires supporting documentation. Please provide the values and analytical data to support this statement.

**33. § 2.2.2.1 Nature and Extent of Contamination, page 2-61**

*“ The 1995 UST investigation appeared to reasonably determine the extent of the contamination at the locations of both the former fill stations; however, the VCA performed in 1996 at the location of the former East Fill Station clearly demonstrated that fractures were an important factor that limited the potential for completely determining extent. ”*

Please clarify what is meant by the term “reasonably determined”. Based on the information provided, extent has not been defined. Please omit “reasonably determined” and indicate that extent has not been defined and fully characterized.

**34. § 2.2.2.1 Nature and Extent of Contamination, page 2-62**

*“ Evaluation of the chromatograms from samples taken from the DP Road Storage Area (PRS 00-027) also are classified as motor oils as well as diesel and, possibly, jet fuel (Loescher 1998, 58988). ”*

This statement implies DP Road Storage Area is a source of contamination in DP Canyon. Please provide documentation (analytical data, fracture flow mechanisms, or other transport data) to support this statement.

**35. § 2.2.2.1 Nature and Extent of Contamination, page 2-62**

“3. *Inorganic chemicals have been identified at concentrations possibly above background values in soils/tuff at DP Tank Farm.*”

The above statement contradicts statements made on page 2-30 of the RFI which state inorganics (with the possible exception of lead) are not present above background at this PRS. Please amend the statements on page 2-30 to indicate that the possibility for inorganic contamination does exist at this PRS.

**36. § 2.2.2.2 Fate and Transport, From The DP Canyon Watershed To The Canyon Bottom, page 2-65**

*“ Another storm drain daylighted in DP Canyon near the location of the former East Fill Station. The location of the inlet to this drain is not known.”*

Please clarify if the inlet to this storm drain will be located during this phase of investigation. As stated earlier in this RFI, a geophysical survey will be conducted to locate any remaining piping, but the survey will not determine the possible inlet if the piping has been removed. Please include in the SAP a plan for determining the origin of the drain if piping has been removed, and for sampling the surrounding area.

**37. § 2.2.2.3 Data Gaps, page 2-68**

*“ Inorganic chemical data at the tank farm and, in particular, in the drainages leading from the tank farm into DP Canyon may be useful in determining whether past tank farm activities could be a source for inorganic chemicals observed in DP Canyon sediments.”*

Please clarify if the drainage ways referenced above are included in Activity 5: Auger hole sampling. If the drainage pathways are not included, please include in the SAP to be submitted a detailed plan for sampling of the drainage pathways. Please provide a detailed map of all drainage pathways (natural and man-made) leading from the DP Tank Farm on the mesa-top to the canyon below. In addition, please identify the approximate locations where soil samples for full suite analysis will be collected and at what depths these samples will be collected. Please note, the Canyons Approach, using geomorphic mapping of the canyon to determine sampling locations is preferred as the method by HRMB.

**38. § 2.2.3.1 Contaminant Source, page 2-68 and 2-69**

*“ Because the original sources of contamination at PRS 21-029 DP Tank Farm, namely the fuel tanks, and all other sources potentially associated with the DP Canyon localized hydrocarbon sheen area have been removed, no contaminant source sampling and analysis is possible.”*

The above statement contradicts statements made previously in the RFI Work Plan, Vol. II (page 2-11). These statements indicate that the tanks and structures at the site are believed to have been removed in May 1988. However, the above statement implies that they are known to have been removed. The purpose of the proposed geophysical survey is to locate any remaining subsurface

structures (fill ports, pipes, tanks or other subsurface structures). Please replace the statement “have been removed” with the statement “believed to have been removed”, as stated previously in the RFI.

**39. § 2.2.2.3 Media Characterization, page 2-70**

*“ The following information should be recorded from each observation event:.... ”*

Please include the volume of water in the channel at the time of inspection, and a description of how relative intensity will be determined.

**40. § 2.2.2.3 Media Characterization, page 2-70**

*“ Precipitation information for correlation with recorded observations will be obtained from the Laboratory meteorological records. ”*

Please clarify if each storm event and the amount of precipitation received during each storm event will be included in the meteorological information. In addition, clarify if the duration and intensity of the storm event be provided.

**41. § 2.2.2.3 Media Characterization, page 2-71**

*“ The sediment sampling should be performed when the canyon is dry, as is generally the case in April through June, both to facilitate sample collection and because observations to date suggest that petroleum hydrocarbons are most evident in the channel during dry periods. ”*

Please provide a detailed standard operation procedure (SOP) for sampling the canyon bottom if it is not dry as anticipated to be during the period of April through June.

**42. § 2.2.2.3 Media Characterization, page 2-72**

*“ After a period of time, the headspace in the container will be analyzed with a PID for organic vapors. Samples with positive readings will be submitted for off-site analysis of BTEX, SVOCs, and diesel and motor oil range petroleum hydrocarbons. ”*

Please define the term “positive readings.” Indicate the concentration that will be used to determine if a sample will be sent to a fixed laboratory for analyses. Also, please include field screening for radionuclides and concentrations at which samples will be sent to a fixed laboratory for analyses.

**43. § 2.2.2.3 Media Characterization, page 2-76**

*“ Auger holes will be advanced to depths of approximately 5 ft below the soil/tuff interface, or to 5 ft if tuff is absent, at these locations. ”*

Please provide a detailed plan to define vertical extent of subsurface soil contamination if there is indication during the field activities (visual, olfactory, or other evidence) that subsurface contamination exists in an auger hole at a greater depth than 5 ft below the soil/tuff interface or 5 ft below the ground surface if tuff is absent. Also, borehole depth should be at a minimum, equal to the depth of the canyon bottom, or hydrocarbon sheen area.

**44. § 2.2.2.3 Media Characterization, page 2-77**

Activity 7 paragraphs two, three and six on page 2-77 discuss headspace sampling and laboratory analysis of tuff, soil and backfill samples collected during the field investigation, and proposed sampling depth. HRMB has the following comments:

Soil or backfill samples should be collected from sufficient depth to determine vertical extent (it may be necessary to go deeper than proposed in the RFI Work Plan). For example, the proposed boreholes at the former locations of tanks TA-21-ATF-6 and -10 may need to be advanced deeper than proposed to define vertical extent if observations in the field indicate soil contamination at a depth greater than 15 feet below the ground surface. Boreholes should be advanced at least as deep as the canyon bottom or hydrocarbon sheen area.

**45. § 3.1 Activity-Specific Data Quality Objectives, Activity 5: Measure Organic Vapor Concentrations on the Walls of DP Canyon, page 3-6**

*“Contingencies: Because the actual PID values are not significant in this sampling event, no contingencies for elevated values are proposed.”*

Although it is assumed that elevated PID readings will not be encountered, the possibility does exist. Please provide a detailed contingency plan to address measures to be taken in the event elevated PID readings are encountered during this phase of investigation. In addition, please provide a limit (or value) to determine what readings are considered to be “elevated.”

**Miscellaneous Comments (No Response Required)**

**1. Figure 1-3. Location of DP Tank Farm, PRS 21-029, at TA-21., page 1-4**

Please label DP Canyon on Figure 1-3.

**2. Figure 2.2-1. Locations of samples collected during the 1994 investigations of DP Tank Farm., PRS 21-029, page 2-27**

The eastern fence line of DP Tank Farm is not shown on the map (or identified on any Figure pertaining to DP Tank Farm in this Work Plan).

**3. Figure 2.2-14. Surveillance and canyons investigations sampling locations in DP Canyon., page 2-57**

The location of DP Tank Farm is not labeled or identified on the map and should be in order for the reader to better determine the location and distance of the monitoring locations in relation to DP Tank Farm.

**4. § 2.2.2.3 Media Characterization, page 2-74, third paragraph**

The acronym SUMMA is used, but it is not defined in the text or in the acronyms and abbreviations (located on pages vii-viii).

**5. Table 2.2-2 Summary of Samples and Analyses, page 2-78**

The heading of Table 2.2-2 should read Summary of Proposed Samples and Analyses since the sampling plan and analyses have not been approved by HRMB.