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Date: June 30, 2005
Refer to: ER2005-0434

Mr. James Bearzi
NMED – Hazardous Waste Bureau
2905 Rodeo Park Drive East
Building 1
Santa Fe, NM 87505-6303

RECEIVED
JUL 2005
NMED Hazardous Waste Bureau

SUBJECT: SUPPLEMENTAL MATERIAL FOR RESPONSE TO THE WORK PLAN FOR NORTH CANYONS

Dear Mr. Bearzi:

Please find attached the certification page and an electronic (CD) version of the response to the notice of disapproval (NOD) on the Work Plan for North Canyons dated June 15, 2005. These materials were inadvertently omitted from the original package provided to the New Mexico Environment Department. We apologize for any inconvenience this may have caused.

Please feel free to contact Danny Katzman at (505) 667-6333 (katzman@lanl.gov) with any questions or concerns.

Sincerely,

David McInroy, Deputy Program Director
Environmental Remediation & Surveillance
Los Alamos National Laboratory

Sincerely,

David Gregory, Federal Project Director
Department of Energy
Los Alamos Site Office

DK/ds

Enclosures: 1) Certification Page
2) CD version of the response to the notice of disapproval for the Work Plan for the North Canyons dates June 15, 2005

Cy:(w/enclosure):
ENV-ERS File, MS M992
RPF, MS M707

7732

CERTIFICATION

CERTIFICATION BY THE ENVIRONMENTAL STEWARDSHIP– ENVIRONMENTAL REMEDIATION & SURVEILLANCE PROGRAM TECHNICAL REPRESENTATIVES

Document Title: **SUPPLEMENTAL MATERIAL FOR RESPONSE TO THE WORK PLAN FOR NORTH CANYONS**

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 ensure 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.

Name: _____ Date: 6/30/05

David McInroy, Deputy Project Director
Environmental Remediation & Surveillance Program
Los Alamos National Laboratory

or

_____ Date: _____

Ken Hargis, Division Leader
Environmental Stewardship Division
Los Alamos National Laboratory

_____ Date: 7/06/05

David Gregory, Federal Project Director
Environmental Restoration Program
Department of Energy/Los Alamos Site Office

or

_____ Date: _____

John Ordaz,
Assistant Area Manager of Environmental Projects
Department of Energy/Los Alamos Site Office

Response to
Notice of Disapproval, Work Plan for the North Canyons,
Los Alamos National Laboratory
U.S. Environmental Protection Agency ID #NM0890010515, HWB-LANL-05-001

INTRODUCTION

This is Los Alamos National Laboratory's (the Laboratory's or LANL's) response to the Notice of Disapproval (NOD) (NMED 2005, 88734) issued by the New Mexico Environment Department (NMED) for the "Work Plan for the North Canyons" (LANL 2001, 71060). To facilitate review of this response, NMED's comments are included verbatim and are organized into general and specific categories. The Laboratory's responses follow each NMED comment. Pending agreement from NMED of these responses, the Laboratory will proceed with preparing a redline strikeout version of the work plan indicating where text has been revised.

This response contains discussions regarding radioactive materials, including source, special nuclear, and by-product material. The management of these materials is regulated under the Atomic Energy Act and is specifically excluded from regulation under the Resource Conservation and Recovery Act (RCRA) and the New Mexico Hazardous Waste Act. Information on radioactive materials and radionuclides, including the results of sampling and analysis of radioactive constituents, is voluntarily provided to NMED in accordance with U.S. Department of Energy policy.

GENERAL COMMENTS

NMED Comment

1. *The Permittees must provide a brief description of investigation, sampling or analytical methods and procedures in documents submitted to NMED that includes sufficient detail to evaluate the quality of the acquired data in accordance with Section IX.A, Standard Operating Procedures, of the March 1, 2005 Consent Order (Consent Order). The Permittees must not only reference Standard Operating Procedures (SOP), they must provide a brief description.*

LANL Response

1. The Laboratory will add a table to the end of Section 7 that includes a brief description of relevant sampling and analytical methods.

NMED Comment

2. *Figures must include all applicable features and structures, underground utilities, and existing well and/or borehole locations. For example, Figure A-1 does not depict the locations of PRSs 10-003(a-o) and 10-007 and Figure 1.4-1 does not show the current watershed boundaries. This type of information is important to determine if proposed sampling locations are adequate or if additional samples are required. The Permittees must ensure these changes are also reflected in the Investigation Report.*

LANL Response

2. The Laboratory will provide a replacement for Figure A-1 that shows all potential releases sites (PRSs, now referred to as solid waste management units [SWMUs] or areas of concern [AOCs]) within the North Canyons watershed boundaries. The watershed boundaries shown in

Figure 1.4-1 are current except for the northeast side of Guaje Canyon, where the watershed boundary was truncated at the edge of the available digital elevation model coverage. The replacement figure for Figure 1.4-1 will include the northeast boundary.

NMED Comment

3. *The Permittees shall provide all relevant aerial photographs of the North Canyons. The Core Document for Canyon Investigations, dated April 1997 (core document) (section 2.3.5.2) states that aerial photographs are an integral part of the historical evaluation of movements and deposition of sediments over time in the canyons.*

LANL Response

3. The Laboratory has not yet examined aerial photographs of the North Canyons in respect to the proposed investigation, and will not know which aerial photographs are relevant to the North Canyons investigation until the work plan is implemented. The Laboratory will provide copies of relevant aerial photographs to NMED during the course of the investigation.

NMED Comment

4. *The Permittees repeatedly uses the word "significant" throughout the document to qualify existing contaminant levels or to explain how future data will be evaluated. The meaning of the word in this context, however, is vague. The Permittees should only describe contaminant levels in terms of their relationship to background levels, cleanup standards, cleanup levels, or any other standard/level available for comparison to the corresponding constituent (or contaminant).*

LANL Response

4. The Laboratory will clarify the intended meaning of the sentences that use the word "significant" in relation to contaminant levels.

NMED Comment

5. *The Permittees shall provide all available data that have been collected from the North Canyons in summary tables prior to and subsequent to the Work Plan submittal in September 2001. The Permittees shall provide separate tables for each applicable medium (soil, sediment, surface water, storm water, springs, alluvial groundwater, perched intermediate-depth groundwater, and regional groundwater). If the data have already been provided in the requested format below, the Permittees shall indicate a reference for the document. The requested data shall be submitted in the following format:*
   - *A) A map with all past sampling locations for each medium clearly identified for each SWMU/AOC.*
   - *B) Tables in an electronic format (MS Excel, MS Access, or a pdf file of the actual laboratory reports) containing the following: sampling location, sampling date, medium, analytical method, fraction (total or dissolved, if applicable), sample depth (if applicable), suspended sediment concentration (if applicable), constituent, analytical result, units, qualifier as assigned by the analytical laboratory, detection limit or MDA/MDC (for radionuclides), practical quantitation limit or Total Propagated Uncertainty (TPU) (for radionuclides), background value, and applicable screening criteria/standard.*

LANL Response

5. The Laboratory recommends that the SWMU- and AOC-specific data requested by NMED would be more appropriate to submit as part of the aggregate work plans that the Laboratory has submitted or is preparing to submit for Bayo Canyon and Guaje/Barrancas/Rendija Canyons.

These are the work plans for the Bayo and Guaje/Barrancas/Rendija aggregates. The background section of the North Canyons work plan (and other canyon work plans) is only intended to provide an overview of what is known for the SWMUs and AOCs in the watershed. Unlike site-specific or aggregate area work plans, canyon investigation work plans are directed toward characterizations at a watershed scale, rather than at the scale of specific SWMUs or AOCs. The investigation approach proposed in this work plan utilizes a conservative strategy that involves full-suite analysis and multiple sampling phases to fully characterize the watershed and is consistent with previously approved work plans and the Core Document for Canyons Investigations. Thus, the Laboratory recommends that the detailed information that NMED is requesting be provided to NMED in the Bayo and Guaje/Barrancas/Rendija aggregate area work plans, to be submitted in July 2005.

NMED Comment

6. The Permittees shall provide a list (in table format) of all known SWMUs or AOCs, in the North Canyons, along with the corresponding COPCs at each SWMU/AOC as identified in previous investigations, regardless of NFA status. If such investigations were not conducted, the Permittees will make a note of that on the list. The Permittees will include in this list all contaminants detected above background levels or above detection limits as determined by the previous investigations. No COPCs shall be eliminated at this stage of the investigation.

LANL Response

6. The Laboratory included a list of all known SWMUs or AOCs (as PRSs) in the North Canyons in Table B-1 of the work plan. The Laboratory discussed analytes identified as chemicals of potential concern (COPCs) for each SWMU and AOC in the text in Section 2.3 (LANL 2001, 71060, pp. 2-10 to 2-34). Evaluation of previous investigations to identify SWMU- and AOC-specific COPCs is presented in aggregate area work plans rather than canyons investigation work plans. For example, COPCs for SWMUs and AOCs in Bayo Canyon are identified in the historical investigation report that will be submitted with the "Bayo Canyon Aggregate Area Investigation Work Plan" to be submitted to NMED in July 2005.

NMED Comment

7. The "Executive Summary" (pg. ES-1) states that one of the purposes of the investigation is to "assess present-day risk to human health and ecological systems and evaluate the potential for transport of contaminants that could cause future human health and ecological risks…" For future reference, the Permittees shall not address human or ecological risk in their work plans.

LANL Response

7 The text referred to in the NMED comment is presented under the heading "Purpose of this Document," which may be a source of confusion. The Laboratory agrees with NMED that the purpose of the work plan is not to assess human or ecological risk. Rather, one purpose of the work plan is to present a technical approach for collecting data that, in addition to determining nature and extent, can be used to assess human and ecological risk. The Laboratory will revise the Executive Summary to clarify this difference.

NMED Comment

8. The Permittees shall install a regional aquifer well (R-24) in the former TA-10 site in Bayo Canyon as stated in a letter dated March 29, 2005.

LANL Response

8. The Laboratory is planning to install a regional groundwater well (R-24) as part of the Bayo Canyon aggregate area investigation at the location described in the letter dated March 29, 2005.

SPECIFIC COMMENTS

1. Section 1.2 Relationship to Other Documents, page 1-3, paragraph 1:

Permittees' Statement: "Environmental investigations will follow an iterative approach in which information obtained from each successive sampling event will be evaluated in the context of the existing conceptual model and will be used to update the conceptual model." "These evaluations may lead to changes in the locations, numbers, and sequence of future sampling events and the characterization/observation wells."

NMED Comment

Using an iterative approach is acceptable; however, as a reminder, the Permittees must submit sampling results/data to NMED for review prior to any subsequent sampling.

LANL Response

The Laboratory will submit sampling results from each phase of an investigation to NMED for review prior to subsequent sampling.

2. Section 1.5.1.1 Surface Sediment Investigations, page 1-7, paragraph 2:

Permittees' Statement: "If needed, subsequent sampling generally is limited to contaminants of potential health or ecological concern identified during the initial sampling and analysis."

NMED Comment

As a reminder, subsequent sampling should also be based on the need to determine extent of any contamination, not solely on risk. The Permittees must revise the text to reflect this change.

LANL Response

Chemicals of potential concern are analytes that exceed background levels (BVs) or detection limits. The subsequent sampling phases are designed to determine extent for the contaminants (i.e. COPCs) identified during the initial full-suite sampling phase. The Laboratory will revise the text to clarify that subsequent sampling will also include the goal of evaluating the extent of contamination.

Permittees' Statement: "Sediment sampling is mainly restricted to post-1942 sediment deposits, including the active channels, adjacent floodplains, and abandoned channels."

NMED Comment

The Permittees shall investigate all contaminated sediment (pre- or post-1942), as the mobility of contaminants cannot be disregarded. As stated by the Permittees, the purpose of this investigation (section 1.1) is to "determine the degree to which the stream channel sediments, active floodplain sediments, and, if present, any persistent surface water and underlying alluvial groundwater in the north canyons have been affected by Laboratory release…"

LANL Response

Section 7.2.2 of the work plan states that "Limited sampling of older sediments may be conducted to test the validity of criteria for distinguishing post-1942 sediment and to gage the importance of other potential contaminant transport pathways." In this regard, the Laboratory will add a sentence to Section 1.5.1.1 that similarly indicates that sampling of pre-1943 sediment will occur to evaluate the potential migration of contaminants into these older sediment deposits.

3. Section 1.5.1.2 Surface Water Investigations, page 1-8, paragraph 1:

Permittees' Statement: "Characterization of storm water runoff is not part of Canyons Focus Area investigations but is included as part of some PRS investigations at the Laboratory."

NMED Comment

Although contamination in storm water runoff is not covered under this work plan, it should be included as part of the risk evaluation for the North Canyons Investigation Report.

LANL Response

Risk assessments are based on potential risks posed by COPCs that are persistent in the environment and that could therefore lead to chronic exposures. Because storm-water flow is short-lived (typically only a few hours or less) the assessment of COPCs at concentrations found in storm-water runoff are not applicable for inclusion into a risk assessment. However, the Laboratory will include storm-water data in the North Canyons investigation report and compare those data to relevant standards.

4. Section 1.5.1.3 Alluvial Groundwater Investigations, page 1-8, paragraph 1:

Permittees' Statement: "No alluvial groundwater is known to be located downstream of any PRSs in the north canyons area; therefore, the need to conduct alluvial groundwater investigations is not anticipated."

NMED Comment

In point of fact, there is potential alluvial groundwater present in the middle to lower reaches of Guaje Canyon and the lower section of Rendija Canyon, based on a map submitted by the Permittees as part of the 2005 General Facility Information in March 2005. The 'Requirement 6: Known and Suspected Extent of Alluvial Groundwater at Los Alamos National Laboratory' map shows that there is "potential" and "persistent" saturation in much of Guaje Canyon and "potential" saturation in the lower section of Rendija Canyon. Based on all of the above information, the Permittees must complete one alluvial groundwater well in Rendija Canyon, west of the confluence with Guaje Canyon, between wells G-6 and G-4a (based on Figure A-1 in this Work Plan). The Permittees shall sample the alluvial groundwater to determine whether the AOC and SWMUs in Rendija Canyon have contributed to alluvial groundwater contamination. If alluvial groundwater is encountered, the Permittees must construct and sample the well in accordance with Section IV.A.3.e.i of the Consent Order. Upon review of the groundwater sampling results, NMED may require further investigation.

The Permittees must also explain why there are several discrepancies between Figure A-1 included in the Work Plan and the 'Requirement 3: Locations of Monitoring Wells, Water Supply Wells, and Vapor Monitoring Boreholes at Los Alamos National Laboratory' map, which was included with the 2005 General Facility Information submittal. For example, well G-6 is shown on Figure A-1, but it is not shown on the Requirement 3 map. The Layne Western well's location is not identified on Figure A-1, but it is listed as a Regional Aquifer Monitoring well on the Requirement 3 map. Wells G-1 and G-2 are not identified on the Requirement 3 map; however, they are shown as "other hole/well" on Figure A-1. Finally, G-3 is identified

as a Regional Aquifer Monitoring Well on the Requirement 3 map, but shown as an "other hole/well" on Figure A-1.

LANL Response

The Laboratory agrees that it is appropriate to complete an alluvial well at the indicated location and to sample and analyze any groundwater that is present. The relevant portions of the work plan will be revised to reflect the inclusion of this work scope.

Figure A-1 in the Work Plan will be updated to reflect the new status of old supply wells in Guaje Canyon. Specifically, the designation of G-3 will be changed to "observation well." Wells G-1, G-2, G-4, G-5, and G-6 will be changed from "other hole/well" to "plugged and abandoned well". Note that in addition to the Guaje replacement wells (G-2a through G-5a), only G-1A of the original water supply wells continues to contribute to production from the Guaje well field. The Layne-Western well is shown in Figure A-1 as a test hole in Guaje Canyon, just west of the San Ildefonso Pueblo boundary, near G-1.

The Requirement 3 map of the 2005 General Facility Information submittal will be updated in the annual submittal to include the former water supply wells G-1, G-2, G-4, G-5, and G-6 (now plugged and abandoned).

5. Section 1.5.2.3 Decision Factors for Bayo, Barrancas, Rendija, and Guaje Canyons, page 1-10:

A) Permittees' Statement: "To establish COPCs for each canyons system, analytical results from each reach in the north canyons are compared to comparable background values, post-Cerro Grande fire concentrations, and relevant standards, according to the most recent methodologies and procedures provided by the ER Project Analysis and Assessment Focus Area. A weight-of-evidence approach will be used to determine COPCs."

NMED Comment

COPCs should be determined based on a comparison to background levels or to detection/quantitation limits and whether they are expected at the site. In these cases where background levels are not available, LANL must retain all detected constituents as COPCs. This is the current NMED position.

The Permittees shall revise the Work Plan to implement the approach explained above. A similar approach is described in the RCRA regulations for groundwater (40 CFR 264.95- 284.100) and the EPA guidance "Statistical Methods For Evaluating The Attainment of Cleanup Standards", Volume III, December 1992, for soil medium. The purpose of any investigation shall be whether the site measurements are significantly (statistically) different from the reference-area measurements.

LANL Response

The approach described by NMED in Specific Comment #5 is and has been the Laboratory's approach as well. The Laboratory will revise the work plan to clarify that analytes with sediment BVs will be retained as COPCs if any detected results are greater than BVs. Detected analytes with no BVs and nondetected inorganic analytes with detection limits above BVs will also be retained as COPCs. As a subsequent step for reaches downstream of areas burned by the Cerro Grande fire, the Laboratory anticipates that comparisons will be made to data from post-fire baseline sediment samples reported in the "Los Alamos and Pueblo Canyons Investigation Report" (LANL 2004, 87390) to help identify which COPCs are associated with the redistribution of ash from the burn area. For groundwater data, the Laboratory will

compare the results to the background values that will be presented in the pending groundwater background report and to relevant standards.

B) Permittees' Statement: "If the uncertainty in estimated risk values is likely to influence a decision based on the risk assessment, the investigators consider whether additional data are needed before completing the risk assessment and uncertainty analysis."

NMED Comment

NMED's (and EPA's) criteria for determining a possible release from a site (SWMU, AOC, etc.) is the exceedance of background levels (or detection limits), not "estimated risk values" or "screening levels for human and ecological risk." The Permittees shall revise the Work Plan to adopt the NMED-approved approach.

LANL Response

The Laboratory agrees with NMED that exceedance of BVs or detection limits is the primary criterion for determining possible releases from sites. However, the referenced sentence is under the bullet "Are the data adequate to support risk-based decisions?" and does not refer to determining the existence of possible releases or extent from SWMUs or AOCs. Therefore, the Laboratory suggests that the sentence is appropriate as written.

6. Section 2.3 Sources of Potential Contaminants within Bayo Canyon, page 2-9, paragraph 2:

Permittees' Statement: "The information compiled in this section is based on available reports and data as of circa December 2000. Additional and updated information about the status of PRSs can be obtained from the Laboratory's ER Project office and/or the Laboratory's Public Reading Room in Los Alamos, New Mexico, as described in Section 7.2.2 of Installation Work Plan for Environmental Restoration Project (LANL 2000, 66802, p. 7-3)."

NMED Comment

See General Comment #5.

LANL Response

See response to General Comment #5.

7. Section 2.3.2.5.3 RFI Interim Action for Strontium-90 in Vegetation, pages 2-20 through 2-27:

Page 2-22

Permittees' Statement: "The highest concentration of strontium-90 was 340.02 pCi/g in a sample from 4.2-ft (1.3m) depth."

NMED Comment

The Permittees must identify the location from which this sample was obtained. The Permittees must also explain why contamination was detected at 4.2-ft bgs when in paragraph three of this section, the Permittees state that "some strontium-90 remained in the bottom of the pit and all solid waste was

excavated to a depth of 26 ft. Because gross beta radioactivity was near background levels, the pit was backfilled with clean fill."

LANL Response

The background section of the work plan is intended to provide a summary overview of SWMU data that provides a basic context for the canyons under investigation. The Laboratory recommends that the SWMU-specific information that NMED is requesting is more appropriate for inclusion in the historical investigation report to be submitted to NMED with the "Bayo Canyon Aggregate Area Investigation Work Plan" in July 2005. See also the Laboratory's response to General Comment #5.

Page 2-24

NMED Comment

Based on the information provided in this section, it is unclear whether the samples obtained during the RFI at PRS 10-003(a-o) in 1994 were analyzed for a full-suite of analytes. The RFI report states that analysis for SVOCs, TAL metals, total uranium, and Sr-90 were completed at 10-003(a-o). The Permittees must clarify which analyses were conducted at PRS 10-003(a-o) and, if applicable, why a full-suite analysis was not conducted.

LANL Response

See response to the first NMED comment in Specific Comment #7.

Page 2-26

Permittees' Statement: "Samples were collected and shipped to fixed laboratories for analysis of TAL metals, HE, gamma spectroscopy, total uranium, and strontium-90."

NMED Comment

The Permittees must explain why a full-suite analysis (including VOCs and SVOCs) was not conducted on samples from PRS 10-008.

LANL Response

See previous two responses to Specific Comment #7.

8. Section 3.4.1.2, Historic Channel Changes, page 3-10, paragraph 2:

Permittees' Statement: "Recent sedimentation and degradation rates vary within each watershed and have not been fully identified. Localized aggradation and degradation processes may occur to raise or incise a specific interval of the streambed."

NMED Comment

The Permittees shall examine relevant aerial photographs and documentation in order to define the approximate locations where construction and excavation within the North Canyons have contributed to the alteration of the natural topography of the canyons. Such a study may lead to eliminating the surface investigations of certain areas of the canyon floors, and investigating to a greater extent the impacted

groundwater (alluvial and intermediate). The Permittees shall focus their resources on investigations that would gain the maximum amount of useful information based on current canyon conditions.

LANL Response

During the course of investigations of specific reaches, the Laboratory will examine relevant aerial photographs and available documentation and make field observations to identify where construction activities have altered the natural topography. The Laboratory agrees with NMED that areas where such disruption has occurred should be avoided for sampling to best focus resources.

9. Section 3.4.1.3.2, Former TA-10 Site in Bayo Canyon, page 3-11, paragraph 2:

Permittees' Statement: "Stations A and B (upstream and within Bayo Site) were analyzed for gross alpha and beta activity, plutonium-238 and plutonium-239. Stations C and D (downstream of Bayo Site) were analyzed only for plutonium-238 and plutonium-239. Analytical results from Stations A and B (upstream of Bayo Site and within Bayo site) showed that gross alpha activity and plutonium concentrations were approximately background levels while gross beta concentrations were approximately twice background levels."

NMED Comment

The Permittees must provide information regarding the analytical results for Stations C and D.

LANL Response

This section will be updated to include available information for Stations C and D.

10. Section 3.4.1.3.5.1, Summary of Soil and Sediment Sampling at TA-0, Upper Bayo Canyon, page 3-18:

Permittees' Statement: "The results showed that three samples contained lead above BV but below the screening action level (SAL) value."

NMED Comment

See Specific Comment #5A.

LANL Response

The statement in the work plan is part of an overview of the results at various sites in the watershed. The results are provided in the context of two useful points of reference: BVs and SALs. NMED Specific Comment #5A refers to how COPCs are identified. The referenced discussion does not address COPC identification. Additionally, the Laboratory proposes that comparison to SALs for information purposes is consistent with the guidance in NMED General Comment #4.

11. Section 3.4.4.1, Alluvial Groundwater Investigations, pages 3-42 through 3-44:

Permittees' Statement: "In fall 1966, two shallow test holes were drilled in Guaje Canyon between the Rendija Canyon fault and the Guaje Mountain fault. The boreholes GCTH-1 and GCTH-2 were located approximately 3 mi (4.8 km) downstream of the Guaje Reservoir." "Saturation in the boreholes was reported from the approximate level of the Guaje Canyon stream channel to total depth (Purtymun 1995,

45344, p. 299). Groundwater samples were not collected and the wells have not been monitored routinely."

NMED Comment

The Permittees must provide additional information regarding these wells (GCTH-1 & GCTH-2) drilled in Guaje Canyon. Information should include general construction detail, depth of the well, and the most recent sampling event water levels and corresponding results.

LANL Response

As reported in the cited document (Purtymun 1995, 45344, p. 299), the wells were drilled to depths of about 23 ft for GCTH-1 and 103 ft for GCTH-2. "Both holes were cased with 2-in.-diam. perforated plastic pipe; the depth and length of the perforations are unknown." Any additional information that can be obtained for these wells will be updated in the revised work plan submittal.

12. Section 5.0, Technical Approach, page 5-1:

Permittees' Statement: "The technical approach employed in the North Canyons investigations is identical to that described in Chapter 5 of the "Core Document for Canyons Investigations"

NMED Comment

NMED agrees with the technical approach. However, as a reminder, if the core document conflicts with the Consent Order in any way, the Permittees must defer to the Consent Order requirements.

LANL Response

The Laboratory will continue to follow the technical approach in the NMED-approved Core Document for Canyons Investigations (LANL 1997, 55622; LANL 1998, 57666; NMED 1998, 58638), except where it conflicts with the more recent Consent Order. As noted in Section III.M of the Consent Order, the requirements of the approved work plan will replace the requirements of the Consent Order when the approved work plan differs from the Consent Order.

13. Section 7.2.3, Sampling and Analysis Plan for Sediment Investigation, page 7-8, paragraph 2:

Permittees' Statement: "Field surveys and mapping, as well as sampling and analysis tasks, initially will concentrate on 10 reaches but may be expanded to include additional canyon reaches."

NMED Comment

The Permittees must explain the criteria for the addition and elimination of reaches, and the number of samples that will be collected from the additional (or expanded) reaches. The Permittees shall not eliminate reaches (and therefore eliminate parts of the canyon) from further investigation or choose new reach locations until the report from the initial investigation has been reviewed by NMED.

LANL Response

The Laboratory anticipates that additional reaches, beyond the 10 priority reaches specified in Table 7.2-1 (p. 7-8) of the work plan, will be investigated if investigation of the priority reaches identifies COPCs associated with Laboratory operations, and if data from additional reaches are required to define their source(s) and/or upstream or downstream extent. The Laboratory does not intend to eliminate any of the

priority reaches from investigation. It is anticipated that at least 10 samples (and one quality assurance [QA] duplicate) would be collected from any additional reaches. The need to collect additional samples in subsequent phases will be evaluated after the initial phase of sample data is evaluated.

14. Section 7.2.4, Canyon Reaches Planned for Investigation, page 7-11 through 7-13:

Permittees' Statement: "…if significant concentrations of contaminants are found, a contingency reach may be sampled downstream…to determine the extent and distribution of contaminants."

NMED Comment

See Specific Comment #13, above.

LANL Response

See the Laboratory's response to Specific Comment #13.

15. Section 7.2.5.1, Sampling Design, page 7-13, paragraph 4:

Permittees' Statement: "Due to the scarcity of information available on contaminants in the north canyons system, the initial samples collected in each reach will be sent to an off-site laboratory for full-suite analyses, to ensure that no contaminants were overlooked during the historical analyses."

NMED Comment

The Permittees shall list the subreaches intended for sampling within each reach for the initial round of full-suite analyses.

LANL Response

The initial reaches and subreaches intended for full-suite sampling are those identified as "priority areas for initial characterization" in Table 7.2-1 of the work plan (p. 7-8).

16. Section 7.2.5.1, Sampling Design, page 7-13 through 7-14:

NMED Comment

Considering the large area of the North Canyons and the "scarcity of information available on contaminants", the Permittees shall revise its sampling design to include field screening specially designed to assess the reaches in the canyons and the contaminants in each reach prior to full-suite analyses sampling.

The Permittees shall include in this Work Plan the specific design of the field screening. This information should include field screening tests to be conducted (HE, PCB, VOCs/SVOCs, metals, and radionuclides, whichever are appropriate), detection limits of the field methods, grid size of the field screening area, and the rationale behind the field screening methods and locations. The results of the field screening (tests results, screening locations, QA/QC) must be provided as part of the investigation report, so that NMED can evaluate the Permittees' assessment of which reaches (or subreaches) shall be addressed with higher priority in the subsequent phases of the investigation.

LANL Response

The Laboratory has found from prior sampling and investigation experience in other canyons that it is inefficient to obtain field screening data in the absence of analytical data that identifies which contaminants are present and their concentrations. In some previous investigations, considerable effort was expended in collecting field-screening data that ended up being of no value because contaminant concentrations were too low for detection with field instruments (e.g., in lower Los Alamos and Pueblo Canyons [Reneau et al. 1998, 59159; Reneau et al. 1998, 59160]). In other canyons, field-screening data targeted to specific analytes has been of great value where contaminant concentrations are relatively high (e.g., in Acid, DP, upper Los Alamos, and Mortandad Canyons and Cañon de Valle) and where the screening was targeted to analytes identified in prior analyses at off-site laboratories. Therefore, the Laboratory proposes to maintain the investigation strategy presented in the work plan; first collect samples for full-suite analyses at representative locations in each reach and then consider field screening for specific analytes if contaminant concentrations are found to be high enough to make the field-screening methods useful in meeting investigation objectives.

17. 7.2.5.3, Analytical Methods, page 7-15:

Permittees' Statement: "To meet the objectives for representativeness and comparability, the sediment samples will be homogenized in the field using a stainless steel bowl and spoon before they are placed in a container. Gravelly samples will be sieved, in either the field to remove stones greater than 2 mm (0.08 in.) in diameter."

NMED Comment

Homogenization of discrete samples collected for analyses other than VOCs and SVOCs shall be performed by the analytical laboratory and not in the field unless prior approval is received from NMED. Any samples collected for analyses of VOCs and SVOCs shall not be homogenized. Sieving of samples is not always necessary and can cause bias in the sampling results. The Permittees shall not sieve samples in the field. The laboratory may sieve the soil samples only if it has a standard operating procedure on the subject.

LANL Response

Homogenization of samples (except for VOC analyses) is part of the standard protocol in RCRA sampling guidance, and is therefore included in the Laboratory's standard operating procedure for spade and scoop sampling. (see Chapter 9 of U.S. Environmental Protection Agency [EPA] SW-846). LANL proposes that homogenization is appropriate to ensure that aliquots are equally representative of the sample location, increasing reproducibility of analyses, and also supports evaluation of potential collocation of contaminants. This step also has been included in prior NMED-approved work plans (e.g., those for Los Alamos and Pueblo Canyons and Mortandad Canyon) and has been performed by NMED and EPA in various independent sampling events at LANL (e.g., in the South Fork of Acid Canyon). The Laboratory proposes that no changes be made to this procedure.

Sediment samples often contain high (>50%) gravel content and roots and other woody debris, and sieving of samples has been performed to standardize the analyses and eliminate uncertainties associated with incorporation of variable amounts of gravel and large organic material into the samples. Because contaminant concentrations typically increase with decreasing particle size, any biases imparted by sieving would be on the high side and would, therefore, result in a conservative estimation of

contaminant levels and potential risk. This step has also been included in previous NMED-approved work plans, and implemented by NMED during independent sampling. Therefore, the Laboratory requests that routine field sieving of samples to remove gravel and large organic matter be approved by NMED in this work plan.

18. Section 7.3.4.2, Analysis of Surface Water Samples, Table 7.3-3, page 7-24:

NMED Comment

The Permittees list the detection limits for beryllium to be 5 mg/L and for thallium to be 2 mg/L. The detection limits for any constituent shall not be equal to or higher than the corresponding EPA MCL, EPA health advisory, NMWQCC standard, or any other standard or screening level. The Permittees shall revise the table to show lower detection limits and advise the analytical laboratories of the required detection limits.

The estimated detection limits (EDL) for antimony, cadmium, cobalt, silver, selenium, and thallium are greater than the corresponding background values. Such detection limits would make it impossible to determine if a release occurred based on background levels. The Permittees shall revise the EDLs to ensure that they are below the relevant background values.

Table 7.3-4 lists the Minimum Detectable Activity (MDA) for americium-241 and plutonium-238 to be 0.05 pCi/g, when the background levels are 0.04 pCi/g and 0.006 pCi/g, respectively. LANL shall revise its MDA value to ensure that they are below the background levels.

LANL Response

The Laboratory will revise Table 7.3-3 to show detection limits of 2 µg/L for beryllium and 1 µg/L for thallium, which are currently achievable and are below applicable regulatory standards. The Laboratory will work with the analytical laboratories to ensure that sufficiently low detection limits are achieved for all constituents using SW-846 analytical methods.

Table 7.3-3 shows EDLs for analytical methods used for surface water, for which there are no BVs for comparison to EDLs. Therefore, the Laboratory proposes that no revision to the table is necessary.

Table 7.3-4 lists MDAs in units of pCi/L, not pCi/g, and the table refers to surface water samples, for which there are no BVs for comparison to MDAs. Therefore, the Laboratory proposes that no revision to the table is necessary.

19. Section 7.4, Alluvial Groundwater Sampling and Analysis Plan, page 7-25:

Permittees' Statement: "No alluvial groundwater is known or suspected to occur in significant quantities downstream of Laboratory-affected portions of the north canyons. Therefore, no alluvial groundwater monitor wells are planned."

NMED Comment

See NMED Specific Comment #4. In addition, according to the Geologic and Hydrogeologic Records of Observation Wells, Test Holes, Test Wells, Supply Wells, Springs, and Surface Water Stations in the Los Alamos Area, by W. D. Purtymun (1995), the Layne Western well had a water level of 100 ft when it was completed in 1950. Neither the report nor the Permittees specify whether this well has been removed. The 'Requirement 3: Locations of Monitoring Wells, Water Supply Wells, and Vapor Monitoring Boreholes

at Los Alamos National Laboratory' map included with the 2005 General Facility Information submittal shows the Layne Western well as a Regional Aquifer Monitoring well in Guaje Canyon.

Based on the above information, if this well still exists, NMED requires that the Permittees assess the condition and integrity of the well, obtain groundwater samples from the well, and complete a full analytical suite (the same analyses proposed for surface water and sediment samples). This information should be documented in the Investigation Report. Also, NMED reserves the right to require additional groundwater investigations contingent upon the results of the required alluvial groundwater well and the initial groundwater sampling at the Layne Western well.

LANL Response

Information about the condition and integrity of the Layne Western well will be included in the redlined resubmittal of the work plan. If a water sample can be obtained, a full suite of analyses similar to the surface water suite will be performed on the sample and the results will be included in the North Canyons investigation report.

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