

T Davis



GARY E. JOHNSON  
GOVERNOR

State of New Mexico  
**ENVIRONMENT DEPARTMENT**  
Hazardous & Radioactive Materials Bureau  
2044 Galisteo  
P.O. Box 26110  
Santa Fe, New Mexico 87502  
(505) 827-1557  
Fax (505) 827-1544



MARK E. WEIDLER  
SECRETARY

EDGAR T. THORNTON, III  
DEPUTY SECRETARY

**CERTIFIED MAIL  
RETURN RECEIPT REQUESTED**

August 26, 1997

Mr. G. Thomas Todd, Area Manager  
Los Alamos Area Office  
Department of Energy  
528 35th Street  
Los Alamos, New Mexico 87544

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

**RE: Request for Supplemental Information  
Canyons Investigation Core Workplan  
Los Alamos National Laboratory  
NM0890010515**

Dear Mr. Todd and Dr. Hecker:

The Resource Conservation and Recovery Act (RCRA) Permits Management Program (RPMP) of the New Mexico Environment Department has reviewed the Canyons Investigation Core Workplan (dated April 1997 and referenced by EM/ER:97-085) and forwards the attached request for supplemental information. LANL must respond to the request for supplemental information within thirty (30) days of the receipt of this letter. If LANL does not submit a complete response to the Notice of Deficiency or submit the response within thirty (30) calendar days, LANL should be advised that a Notice of Deficiency will be issued.

Should you have any questions regarding this letter, please contact me or Mr. John Kieling, RPMP's LANL Facility Manager, at (505) 827-1558.

Sincerely,

Robert S. ("Stu") Dinwiddie, Ph. D., Manager  
RCRA Permits Management Program

RSD:kth

attachment



6918

W F  
SEARCH LINE 4/24/97

TK

Mr. Todd and Dr. Hecker  
August 26, 1997  
Page 2

cc with attachments:

T. Baca, LANL EM-DO, MS J951  
T. Davis, NMED HRMB RPMP  
B. Garcia, NMED HRMB  
T. Glatzmaier, LANL DDEES/ER, MS M992  
J. Jansen, LANL EM/ER, MS M992  
M. Johansen, DOE LAAO, MS A316  
K. Hill, NMED HRMB RPMP  
J. Kieling, NMED HRMB RPMP  
M. Leavitt, NMED GWQB  
H. LeDoux, DOE LAAO, MS A316  
D. McInroy, LANL EM/ER, MS M992  
D. Neleigh, EPA, 6PD-N  
J. Parker, NMED DOE OB  
G. Saums, NMED SWQB  
T. Taylor, DOE LAAO, MS A316  
S. Yanicak, NMED DOE OB, MS J993  
J. Yurk, EPA, 6PD-O  
File: Reading and HSWA LANL 4/1049  
Track: LANL, doc date, NA, DOE/LANL, HRMB/kth, RE, file

**ATTACHMENT**  
**Request for Supplemental Information**  
**Canyons Investigation Core Workplan**  
**April 1997**

**GENERAL**

1. The Watershed Management Project Plan should be coordinated and consistent with the Canyons Investigation Core Document and the subsequent canyon-specific workplans and reports.
2. Please provide a revised schedule for the canyons and canyon aggregates based on negotiations that took place on April 16, 1997 between the Department of Energy/Los Alamos National Laboratory (DOE/LANL) and the Hazardous and Radioactive Materials Bureau (HRMB) representatives. The following sections of the above-referenced document require revision: Executive Summary (Scheduling and Reporting); Table 1-1; Annex 1, and Figure I-1.
3. If changes made to the Hydrogeologic Workplan affect this document, please provide an addendum to the Canyons Investigation Core Document.

**CHAPTER 1 - INTRODUCTION**

4. Section 1.4.1:
  - a. Please revise the following sentence as indicated: "The broad Permit was issued by NMEDEPA..." [first paragraph, page 1-6]
  - b. It should also be stated that the Installation Workplan (IWP) contains the Schedule of Compliance. [second paragraph, page 1-6 and first paragraph, page 1-10]
  - c. LANL's use of the term "facility" is inappropriate: " Facility" should only be used in reference to LANL, itself. [second paragraph on page 1-8]
  - d. The definition of an Area of Concern (AOC) provided in this document is incorrect [first paragraph, page 1-9]. Please revise its definition to be "any suspected release of a hazardous waste or hazardous waste constituent which is not directly associated with a SWMU" (RCRA Facility Assessment Guidance, EPA 1986).

**CHAPTER 2 - BACKGROUND**

5. Section 2.1.1: A disparity in the elevation of the flanks of the Jemez Mountains occurs between this section [page 2-1] and Section 1.2.1 [page 1-1]. Please clarify.
6. Section 2.3.3:
  - a. Please revise Table 2-2 to include a column which indicates the geologic unit in which each well is screened.

- b. LANL should provide confidence levels associated with the ground elevations presented in Table 2-2. NMED's Hydrogeologic Evaluation noted several discrepancies in LANL's data.
  - c. Please revise the following text as indicated: "Groundwater protection activities at the Laboratory includes the installation of an extensive groundwater monitoring system for assessment of water quality..."
7. Section 2.3.3.4:
- a. Likewise, please revise Table 2-3 to include a column which indicates the geologic unit from which the spring appears to discharge.
  - b. Please include an up-to-date inventory of all springs including monumented elevations and coordinates of sampling locations.
  - c. Please revise Table 2-3 such that the water source for Water Canyon Gallery is indicated as emanating from the perched groundwater found within the volcanics on the western sided of the Laboratory. The Water Canyon Gallery is a system designed to collect water from Big Spring which issues from the Bandelier Tuff.
  - d. HRMB recommends that LANL sample the intermediate perched groundwater zone in Los Alamos Canyon at Los Alamos Spring in addition to Basalt Spring. Basalt Spring, as stated in the document, may be affected by nearby surface-water-infiltration, whereas, Los Alamos Spring exhibits constant flow, stable water chemistry and is located approximately 45 feet above the Los Alamos Canyon stream bed.
  - e. Please clarify the current status of springs and surface water in Water Canyon including present and intended use of this water resource.
8. Section 2.3.4.1: This document states "A 300-ft (91-m) borehole drilled to the top of the basalt at TA-33 encountered wet zones in basalt cinder deposits, but no perched groundwater was found." LANL should investigate the TA 33 300-foot borehole for recharge and assess its potential for affecting contaminant migration before making a determination that no perched ground water exists. Wet zones in basalt cinder deposits may indicate saturation.
9. Section 2.3.6: It should be clarified that because the surface water samples obtained for the annual environmental surveillance reports are unfiltered, they cannot be used to determine compliance with the New Mexico Water Control Commission standards (except for barium, chromium or cobalt).

## CHAPTER 3 - ENVIRONMENTAL SETTING

### 10. Section 3.5.1.2

- a. Please revise the following statement as indicated: "Currently ~~only four~~ seven of the canyons are known to contain perennial (flowing continuously) reaches within Laboratory boundaries (Pajarito Canyon, Twomile Canyon, Threemile Canyon, Cañon de Valle, Sandia Canyon, ~~Los Alamos Canyon, Water Canyon, Ancho Canyon, and~~ Chaquehui Canyon).

Currently, perennial surface-water flow in Water Canyon does not extend onto the western boundary of the Laboratory. Perennial flow in Los Alamos Canyon has not been observed to flow within the Laboratory boundary. Perennial flow in Chaquehui Canyon extends for approximately 300 feet from Spring 9A. Spring 9 flows perennially to the Rio Grande within the Laboratory boundary, but is not located in Chaquehui Canyon. A perennial reach in Sandia Canyon exists as a result of the major discharge of treated sanitary sewage effluent.

- b. Please include a discussion of the perennial reaches in Twomile and Threemile Canyons which result from Anderson and TA 18 Springs and the perennial flow from Starmer Gulch and Arroyo de Ladelfe in the discussion of perennial reaches within the Laboratory boundary.
- c. Please revise the description of the perennial reaches in Cañon De Valle and Water Canyon to discount any contribution(s) from Spring 5AA.

11. Section 3.5.3: The information obtained from the 6-hour storm modeling seems pertinent to understanding the effect of intense storm activity on the canyon systems. Please summarize the results of this study within this document.

### 12. Section 3.6.1

- a. Sections 3.6.1.1 through 3.6.1.3 do not appear to directly reflect or correlate with the information provided in Table 3.2. Please provide additional discussion to reconcile Table 3.2 to the information presented in the individual sections.
- b. Section 3.6.1.2: This document states: "The results of this investigation suggest that greater infiltration of water occurs beneath the canyon floors than through the mesa tops; however, moisture content values are only presented for canyon floors. Please provide data regarding the moisture content for the mesa tops to support this conclusive statement.
- c. Section 3.6.1.3: This document discusses moisture curves and in-situ moisture characteristics data, but does not explain how they relate to and effect the hydraulic conductivity. Please provide this explanation.

13. Section 3.7.5.2:
- a. Please indicate which sample (sample number, sample location, date and time) indicated the presence of tritium at  $63 \pm 2.2$  pCi/L in the regional aquifer. [second paragraph]
  - b. Please revise the description of the age estimates of the regional aquifer to reflect the possibility of mixing due to the length of screen and pump depth in the wells sampled. The usefulness of the data is questioned due to the large screened interval from which these samples were obtained. [second paragraph]

#### CHAPTER 4 - CONCEPTUAL MODEL

14. Section 4.1.2:
- a. The following statement should be qualified to indicate that it may only hold true for the present: "But because surface water is rarely ingested, such water is likely to contribute in only a minor way to the overall exposure of humans to contaminants." [top paragraph, page 4-2]
  - b. Please include a potential human exposure scenario of a Laboratory worker who also obtains exposures from recreational activities in or near the Canyons. [bulletized scenarios in the middle of the page]
  - c. Please revise the fourth bullet to clarify that the scenarios will take into consideration whether or not complete exposure pathways exists (not the "...effects of human occupation.").
15. Section 4.1.3, Table 4-1
- a. LANL should provide a more detailed discussion of perched ground water.
  - b. Table 4-1 fails to take into consideration the influence of the dip of stratigraphic contacts on perched ground water flow direction. Other influencing factors on flow direction include grain size of geologic materials, flux through the system, and other geologic structures such as faults and fractures.
  - c. Moisture content and other climatic drivers may also influence the entrainment of dust (Wind-borne dust, page 4-7).
  - d. This table does not clearly consider the bioaccumulation of contaminants from the ingestion of animals and plants as a concept/hypothesis (Animal uptake, page 4-8).
  - e. In Table 4-1 (first row under the "Perched groundwater at depth" section), the statement "Several intermediate-depth perched groundwater zones may be

present beneath large canyon systems whose headwaters are in the Sierra de los Valles..." may be misleading. It seems to relate intermediate depth perched groundwater to the Sierra de los Valles. LANL should revise this statement such that there is no direct relationship between intermediate-depth perched groundwater and the Sierra de los Valles.

- f. LANL should also revise the same statement in Table 4-1 to exclude Sandia Canyon as having headwaters in the Sierra de los Valles.

16. Section 4.2.2: The following statement contradicts evidence presented in Section 3.7.5.3 (page 3-40): "Groundwater in the regional aquifer generally has long residence times..." Section 3.7.5.3 states that age estimates made to date reflect both short and long residence times. Please clarify.

#### **CHAPTER 5 - TECHNICAL APPROACH**

17. Section 5.0: This document contends that National Pollutant Discharge Elimination System (NPDES)-permitted discharges are not subject to corrective action because the discharges are not solid wastes. HRMB has indicated in several past Notices of Deficiency that although a PRS is a permitted outfall, it is not exempt from investigation under the HSWA Module of the RCRA permit. The NPDES program does not have provisions for Corrective Action or requirements for the remediation of contaminated areas. LANL shall investigate all PRSs known or suspected to have managed RCRA solid or hazardous wastes and/or constituents, or Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) hazardous substances.
18. Section 5.1.1: This document states: "Mesa tops, alluvial and colluvial deposits on canyon walls and drainages off canyon walls may contain contaminants from individual PRSs and will be characterized as part of RFIs conducted for other operable units" (paragraph following bullets 1-3, page 5-1).
  - a. In several discussions and site visits conducted with DOE/LANL and HRMB representatives, the "deferral" of certain investigatory activities has been mentioned. The "deferral" of activities from one Field Unit (FU) to another has made it very unclear which FU is responsible for which investigatory activity. Please provide the criteria used to determine which FU will take the lead.
  - b. For each individual sampling and analysis plan (SAP) provided under this core document, please provide a list of mesa top PRSs, alluvial and colluvial deposits on canyon walls and drainages off canyon walls PRSs that may affect that canyon or canyon system and indicate which FU will be conducting their investigation.

19. Section 5.1.3: Please assess human health risk using a residential land use scenario. (See comment provided in the Notice of Deficiency for Operable Unit 1049 Los Alamos/Pueblo Canyon dated March 17, 1997.)
20. Section 5.2.4.1: Archival data used to support NFA decisions must include adequate analytical data [see the Corrective Action (CA) Flow process document].
21. Section 5.3.5: LANL must use approved (by the AA) background data for screening chemicals of potential concern. No site should be proposed for No Further Action (NFA) if concentrations are compared to background values which have not been approved.
22. Section 5.3.7, Decision Point Number 3: Please include the option to conduct best management practices and remedial actions at this decision point. Due to cost, time, and effectiveness, it may be more prudent to perform remedial actions rather than further evaluate the uncertainties.
23. Section 5.3.8.1
  - a. LANL should refer to the American Indian as a special subpopulation (not a "conservative scenario") and shall evaluate both the adult and child American Indian exposure scenarios.
  - b. LANL may utilize Monte Carlo techniques; however, LANL must also calculate the reasonable maximum exposure. See Comment 37.
24. Section 5.4.2.2: Please provide an explanation why this document states that the study area for the assessment of future exposure and impacts on the Rio Grande is not clearly defined: "...in areas both inside and outside the Laboratory boundaries and...on the Rio Grande..."
25. Section 5.6: Per the negotiated CA Process Flow, significant modifications to the scope of work of any workplan should be provided to the AA for approval. Please include a statement indicating such.
26. Section 5.6.2.3: The generic nature of this workplan and the iterative nature of the canyon-specific or canyon aggregate-specific workplans requires enhanced AA involvement at critical decision points. At critical decision points, it appears that the canyons investigation team will be making decisions that will influence the field work investigation. LANL should develop, document and implement a procedure to communicate more effectively with the AA on these investigations. As emphasized in the *Expedited Site Characterization* training course presented by DOE in May 1997, frequent faxes and meetings are recommended as a means of communicating recent activities and critical decision points and soliciting regulator input.

27. Section 5.6.3.1: This document states: "The Ancho and Indio Canyon samples were analyzed for metals. Statistical analyses of data from these completed investigations indicate that these data are probably sufficient to establish background concentrations for the remaining canyons." The AA has provided a LANL a Notice of Deficiency (NOD) on the background study. LANL should refer to or include this NOD and refer to or provide all data and statistical analyses performed on the data, a map of sampling locations in support of this statement, and substantiating evidence from the other canyons indicating that this data set is appropriate for background use.
28. Section 5.6.3.2: LANL should obtain and submit samples from each discernable geomorphic unit within each canyon for full suite analyses prior to limiting the potential constituents of concern and performing limited suite analyses. The potential contaminants of concern for each geomorphic unit may vary. Obtaining samples from each unit would allow for the tentative identification of those constituents particular to each geomorphic unit.
29. Section 5.6.3.3: Please reference an approved methodology for evaluating risk resulting from exposure to radioactive contaminants. From the discussion presented, it is unclear how radiological risk at LANL will be assessed. Previously proposed human health methodology uses a bright line concentration; this document appears to propose using dose and cancer slope factors for risk determination. Neither methodology has been approved by the AA.
30. Section 5.7: In most instances, the installation of monitoring wells (as depicted in Table 5-2) significantly post-dates the activities conducted during the implementation of this workplan. Please explain how LANL intends to integrate the activities in this workplan with those in the Hydrogeologic Workplan.
31. Section 5.7.1: This section does not provide an adequate explanation of the relationship of this workplan with that of the Hydrogeologic Workplan. Please revise this section.
32. Section 5.7.2: This section fails to reflect the activities proposed for implementation within this workplan. Please revise this section.
33. Section 5.7.3:
  - a. Please provide further discussion on the decision-making process for installing intermediate-perched zone monitoring wells.
  - b. LANL should present its rationale for determining if an intermediate perched monitoring well should be drilled. Wells monitoring the intermediate perched

zone may provide valuable contaminant detection and monitoring for the regional aquifer.

NMED has expressed its concerns regarding LANL's approach to intermediate-perched ground water in the letter entitled "Comments Concerning Ground-water Contamination and Protection at Los Alamos National Laboratory (LANL), Los Alamos, New Mexico" to Mr. Kirkman from Mr. Kelley dated August 17, 1995. More specifically, the letter states "Individual zones of saturation beneath LANL have not been adequately delineated, and the hydraulic interconnection between these is not understood. A facility-wide description of ground-water flow beneath the facility cannot be made without adequate delineation of the perched-intermediate aquifer(s) beneath LANL."

34. Section 5.9: Please present proposed studies ("ecosystem receptors and biological communities") in greater detail and obtain approval prior to implementation.
35. Section 5.9.3: Issue: LANL should either conduct a screening risk assessment prior to site-specific sampling of plants, wildlife, and livestock or present the reasoning for omitting this step.

#### **CHAPTER 6 - RISK ASSESSMENT MODELS AND APPROACH**

36. Section 6.2.1: For all risk-based decision making, LANL should calculate a reasonable maximum exposure. The technical approach presented only incorporates a probabilistic approach. In addition to the calculated reasonable maximum exposures, LANL may present the probabilistic approach to justify site recommendations.
37. Section 6.5.4: Issue: Please document a procedure for either using measure animal concentrations or calculating animal concentrations. The ecological risk assessment methodology has not been approved by the AA and will probably not require calculation of concentrations in all of these animals.

#### **CHAPTER 7 - REPORTING**

38. This Chapter should include a method by which LANL intends to communicate more effectively with the AA regarding recent activities and critical decision points and to more actively solicit regulator input.

#### **ANNEX I - PROJECT MANAGEMENT PLAN**

39. Section 2.0: The first bullet in this section states: "to determine...combined releases from all sites...that contribute residual contamination..." This sentence is somewhat

misleading or subject to the interpretation that all contamination in the canyons is "residual" in nature. Please revise and clarify this statement.

40. Section 2.1.1: The opening paragraph does not include the evaluation of transport as suggested in the Executive Summary (page ES-1). Please include the evaluation of transport in this section.

#### **ANNEX IV - PUBLIC INVOLVEMENT PLAN**

41. Section 2.7: If this quarterly technical report is synonymous with the quarterly technical report that the LANL ER Program intends to replace with the monthly Progress Tracking System report, then this section should be revised.

#### **APPENDIX A - MAPS**

- a. Figure A-2: Please revise this figure to indicate if it reflects current or projected land use.