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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 6  
1445 ROSS AVENUE, SUITE 1200  
DALLAS, TEXAS 75202-2733  
March 8, 1990

LANL  
ASWA 70  
III

Mr. Boyd Hamilton  
Environmental Supervisor  
Environmental Improvement Division  
The Health and Environment Department  
P.O. Box 968  
Santa Fe, New Mexico 87504-0968

Dear Mr. Hamilton:

I have enclosed the "Special Conditions Pursuant to the 1984 Hazardous and Solid Waste Amendments to RCRA" as they apply to the final permit for Los Alamos National Laboratory (NM0890010515). We have transmitted this portion of the final permit directly to the permittee.

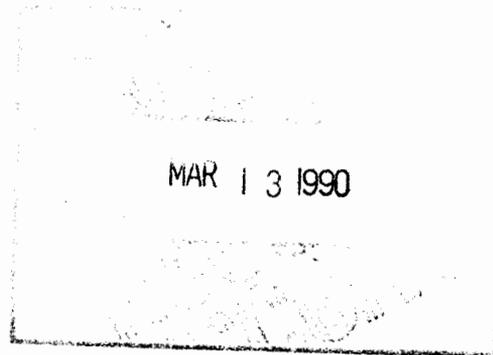
If you need further information in this matter, please call me or contact Bill Gallagher of my staff at (214) 655-6770.

Sincerely yours,

*Allyn M. Davis*

Allyn M. Davis  
Director  
Hazardous Waste Management Division

Enclosure



*Document in magazine file; module VII in permit;  
04/05/90 notice of permit decision and response to comments  
in permitting file.*

TR



Under Federal Law, this permit is effective on the date specified above unless a petition to the Administrator of the U.S. Environmental Protection Agency is filed in accordance with the requirements of 40 CFR 124.19.

Issued this 8<sup>th</sup> day of March, 1990

by Allyn M. Davis  
Allyn M. Davis, Director  
Hazardous Waste Management Division



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 6

1445 ROSS AVENUE, SUITE 1200

DALLAS, TEXAS 75202-2733

NOTICE OF PERMIT DECISION

LOS ALAMOS NATIONAL LABORATORY

Pursuant to the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976 (RCRA), as amended (42 USC §6901 et seq., commonly known as RCRA) and regulations promulgated thereunder by the U.S. Environmental Protection Agency (EPA) (codified in Title 40 of the Code of Federal Regulations), a permit is issued to the United States Department of Energy and the University of California, who operate a hazardous waste facility located in Los Alamos County, New Mexico.

This Permit, in conjunction with the Hazardous Waste Permit issued by the State of New Mexico, constitutes the full RCRA permit for this facility. Any person who commented on this permit during the comment period may petition the Administrator to review any condition of this permit, within 30 days of issuance, pursuant to 40 CFR 124.19.

The Federal Law that has required permits for hazardous waste facilities is RCRA. The State of New Mexico has been authorized by EPA to carry out regulatory activities which were required by RCRA prior to November of 1984.

In November of 1984, Congress passed extensive changes to RCRA, known as the Hazardous and Solid Waste Amendments (HSWA), which resulted in additional permit requirements. The State has not yet been authorized to act in lieu of EPA for this portion of the program, and EPA has retained the authority for this portion of the permit.

This permit has been finalized under a joint effort between the State and EPA. The New Mexico Environmental Improvement Division (NMEID) developed the majority of the permit; however, EPA developed Module VIII, which contains provisions to satisfy the HSWA. EPA will enforce this portion of the permit until the State is authorized to run this portion of the program.

This Module of the joint permit deals primarily with the investigation of hundreds of Solid Waste Management Units (SWMU's) dating from the 1940's. This HSWA Module of the permit requires the Permittee to determine whether there have been any releases for hazardous waste or hazardous constituents from any SWMU at the Los Alamos National Laboratory facility regardless of the time at which waste was placed in such unit and to take appropriate corrective action for any such releases. Other provisions in this Module deal with surface and ground water monitoring, installation of additional monitoring wells, and a waste minimization provision.

Los Alamos National Laboratory  
Response to Comments  
HSWA Permit

I. BACKGROUND INFORMATION

A. Facility Location:

Los Alamos National Laboratory (LANL) is a large (42 square miles) Federal Facility (Department of Energy) in North Central New Mexico, about 40 miles Northwest of Santa Fe. LANL is operated by the University of California for the DOE.

B. Facility Activities and Waste Handling:

LANL is a weapons research facility and as such generates a large number of various waste streams, which change as experiments change. Research in chemistry, physics, and explosive technology generate a wide variety of chemical and radioactive wastes, which are stored, treated on-site, incinerated, and shipped offsite.

C. Public Notice:

The public notice of the proposed permit satisfied the public notice requirements specified in 40 CFR 124.10. The public notice was published in two newspapers, the Los Alamos Monitor, and the Albuquerque Journal North, on May 10 and 11, 1989, and broadcast on KOB AM in Albuquerque daily from May 15 to July 7, 1989. The announcement was also sent to the facility, appropriate State agencies, and interested parties. The public comment period closed on August 24, 1989. A public hearing was held on August 7, 1989.

### III. CHANGES MADE IN FINALIZING THE HSWA PERMIT

Throughout the permit, typographical errors were corrected.

The following was added to the waste minimization requirements:

#### 1. Waste Minimization

The Permittee shall submit a certified plan annually by December 1, for the previous year ending September 30, that:

- (a) The Permittee has a program in place to reduce the volume and toxicity of all hazardous wastes which are generated by the Permittee's facility operation to the degree determined to be economically practicable; and the proposed method of treatment, storage, or disposal is that practicable method currently available to the Permittee which minimizes the present and future threat to human health and the environment. This certified plan/program must address the below items:
  - (1) Any written policy or statement that outlines goals, objectives, and/or methods for source reduction and recycling of hazardous waste at the facility for all hazardous/mixed wastes;
  - (2) Any employee training or incentive programs designed to identify and implement source reduction and recycling opportunities;
  - (3) Any source reduction and/or recycling measures implemented in the last five years or planned for the near future;
  - (4) An itemized list of the dollar amounts of capital expenditures (plant and equipment) and operating costs devoted to source reduction and recycling of hazardous waste;
  - (5) Factors that have prevented implementation of source reduction and/or recycling;
  - (6) Sources of information on source reduction and/or recycling received at the facility (e.g. local government, trade associations, suppliers, etc.);
  - (7) An investigation of additional waste minimization efforts which could be implemented at the facility. This investigation shall analyze the potential for reducing the quantity and toxicity of each waste stream through production reformulation, recycling, and all other appropriate means. The analysis shall include an assessment of the technical cost, and potential waste reduction for each option; feasibility, cost, and potential waste reduction for each option;

- (8) The Permittee shall submit a flow chart or matrix detailing all hazardous wastes it produces, by quantity and type, including mixed waste, and by building/area and program if consistent with security considerations.
- (9) The Permittee shall demonstrate the need to use those processes which produce a particular hazardous waste due to a lack of alternative process, available technology, or available alternative processes that would produce less volume toxic waste; and
- (10) The Permittee shall demonstrate the applicability/inapplicability of the following waste minimization techniques:
  - (a) A program that inventories the amount of contaminated lead that exists at the facility;
  - (b) A program that substitutes steel for lead (whenever possible);
  - (c) If it is impossible to substitute steel for lead, the lead should be coated with a strippable coating to prevent its' entire contamination;
  - (d) A program or bench scale method to decontaminate the contaminated lead;
  - (e) Use of non-hazardous liquid scintillation cocktail solution; and
  - (f) A program designed to prevent comingling of radioactive and non-radioactive waste.

**Section B.3.,** Permit review was deleted from the permit.

**Section B.4.,** was redundant and has been deleted.

**Section C. Perched Zone Monitoring,** the following has been added:  
"After the information from these wells is reviewed, the Administrative Authority may require the installation of more wells to more fully define the extent of contamination.

**Section C., Monitoring of Surface and Ground Water,** the following sentence was added: " .... reports must be submitted to EPA". "Any pertinent ongoing investigations by the U.S.G.S. that are applicable to this module shall be summarized in the LANL Environmental Surveillance Report."

**Section C., Sediment traps Mortandad Canyon,** the word "attempt" has been deleted from this paragraph.

**Under Table A,** SWMU's number 16-008(b), 16-006(c)), 54-003(a), 54-004(Shaft 9), 54-006, and 35-005(a-b) have been removed and SWMU number 0-023 has been added.

**Under Table B, SWMU 1-003** was added.

**Section C., Vertical Extent of Saturation**, the following was added: "A report detailing the results of this study must be submitted within one year of the effective date of this permit."

**Section D.**, the following two paragraphs were added: "Depending on site-specific findings during the Corrective Action Plan process, a site within a task may be removed by a determination that no further action is necessary. A site may also be assigned, to a different task, for example, by implementing interim corrective measures. Either of these actions may be taken by the Permittee with the approval of the Administrative Authority. Such changes will be processed as major modifications, if appropriate, annually.

All work (information, reports, investigation, remediations, etc.) required by this module (VIII) will be deemed as "functionally equivalent" of an Environmental Impact Statement, (EIS). Therefore, the requirements of the National Policy Act will not apply to work required by module VIII. (Note: See case Alabamians for a Clean Environment v. Thomas, No. CV87-0797-W N.D.Ala.Dec. 7, 1987).

**Section G., Notification for Newly Discovered Releases at SWMUs**, has been changed from 15 days to 24 hours. Also the first sentence has been change to read: "The Permittee shall ..... hazardous constituents in which these is a statistically significant increase over the background data for the media of concern,".

**Section H (3).**, the following has been added: "As appropriate and with the approval of the Administrative Authority, the RFI Workplan will be developed and implemented using the phased approach as described in EPA Corrective Action Plan guidance documents. Information obtained during the preceding phase will be incorporated in the modified RFI workplan for the subsequent phase. The draft RFI Report shall be prepared when all phases of the RFI have been completed to the satisfaction of the Administrative Authority.

**Section H (1).**, the following has been added: "The LANL Installation RI/FS Workplan (as part of the RFI Task I.A.) will include an overview of the installation-wide Los Alamos hydrogeological environment. This overview shall be a summary description of the major features and conceptual inter-relationships of the hydrogeological environment at Los Alamos. It should address the regional and installation-wide geologic setting and hydrologic characteristics affecting the occurrence, movement, and interaction of surface and subsurface water with a view toward understanding potential pathways for transport of contaminants. This overview shall provide a guide and referencing to appropriate maps submitted with the installation workplan and to appropriate detailed information in the significant geologic and hydrologic reports and studies listed and summarized in the task "Identification and Summary of Previous Studies" required under Section B., Special Permit Conditions. The overview shall be reviewed

and updated as appropriate annually (as part of the Installation Workplan update) to incorporate the major findings with installation-wide significance from studies conducted under either the Special Permit Conditions or the Task/Site RI/FS investigations.

**Section H (3)e.**, has been added. "The CMS plan for all SWMU's must be submitted within 10 years of the effective date of this permit."

**Section H., Corrective Measures Study,** The original Section in the draft permit has been deleted.

**Section I. Interim Measures:** Two sentences have been added for clarification: "The Administrative Authority may require submission of an interim measure workplan for approval. If for institutional reasons not related to permit work, i.e. routine construction, an interim measure is required, the permittee will submit appropriate documentation to the Administrative Authority for approval.

**Section K.,** The words: "or may present a threat over the lifetime of the wastes" have been added.

**Section K.2.f,** is a new provision which reads "Any pilot or bench scale studies necessary".

**Section O., Remedy Selection, and P., Permit Modification for Remedy,** have been deleted. Subsequent Sections have been modified

**Section P., Scope of Work for a RCRA Facility Investigation**

**Task I, Preliminary Report A.1.c.,** has been changed to read "Topography (using available scales), waterways, all wetlands greater than 1 acre, floodplains, water features, and drainage patterns;."

**Task I, A.1.h.,** has been deleted.

**Task II, D. Community Relations Plan,** has been expanded as follows:

... The Permittee shall prepare a Community Relations Plan (CRP) as part of the RCRA Facility Investigation (RFI) Workplan which allows for public participation in the RFI process. The CRP will include:

1. Establishing an active mailing list of interested parties (to be updated annually), including those on the official facility mailing list who wish to be on LANL's list;
2. Informal meetings, including briefings and workshops as appropriate, with the public and local officials before and during the RFI process, which includes activities associated with the RFI workplan and RFI report;
3. News releases, fact sheets, approved RFI workplans, RFI final reports, Permit Special Conditions Reports and publicly available quarterly progress reports that explain the progress and conclusions of the RFI;
4. Creation of a public information repository and reading room;
5. Updates of materials in the information repository and public reading room;

6. Public tours and briefings to inform and to listen informally to public concerns and answer individual questions.
7. Quarterly technical progress reports for the Administrative Authority;
8. Procedures for immediate notification for the San Idelfonso Pueblo or other affected parties in case of a newly-discovered off site release which could impact them.

**Task III, Facility Investigation**, the following has been added to the first sentence ".... or potential releases for the lifetime of the wastes involved"....

**Task III, A.1. Hydrogeology**, a new condition (h) has been added: "h. An analysis of available geophysical information and remote sensing information such as infrared photography and landsat imagery.

**Task III, A.Z.**, a new condition has been added "r. water balance scenarios"

**Task III, B.1.**, The following sentence has been added: "The RFI workplan shall propose the Task/Site specific maps with an appropriate scale and the following features; wetlands, floodplains, water features, drainage patterns, springs, faults, gravel deposits and alluvium."

**Task III, C.2.e.**, this has been added "... that include worst case scenarios over the life of the wastes involved."

**Task III, C.4.**, a new condition has been added "d. Possibility of future airborne releases.

**Task V, Reports**, a new condition has been added, "C. Technical Quarterly Progress Reports: Beginning February 15, 1990, the Permittee shall submit a technical progress report for the previous quarter which shall at a minimum summarize the work performed, and supply the results of sampling and analysis.

**Task V, D.**, has been modified to add the following to the RFA Report and Summary:

- "1. Within sixty (60) calendar days after the completion of either phase of the RFI (OTET), the Permittee shall submit an RFI Report and a Summary Report. The RFI Report shall describe the procedures, methods, and results of all investigations of SWMUs and their releases, including information on the type and extent of contamination at the facility, sources and migration pathways, and actual or potential receptors. The phase 2 RFI Report shall present all information gathered under the approved RFI Workplan. The phase 2 Report must contain adequate information to support further corrective action decisions at the facility. The Summary shall describe more briefly the procedures, methods, and results from the facility investigation described in the Scope of Work for RFI, Task III.

2. After the Permittee submits either phase of the RFI Report and a Summary, the Administrative Authority shall either approve or disapprove the Reports in writing.

If the Administrative Authority approved the RFI Report and Summary, the Permittee shall mail the approved Summary Report to all individuals on the facility mailing list established pursuant to 40 CFR 124.10(c)(1)(ix), within fifteen (15) calendar days of receipt of approval.

If the Administrative Authority determines the RFI Final Report and Summary do not fully detail the objectives stated under Permit Condition P, the Administrative Authority may disapprove the RFI Final Report and Summary. If the Administrative Authority disapproves the Report, the Administrative Authority shall notify the Permittee in writing of the Reports' deficiencies and specify a due date for submittal of a revised Final Report and Summary. Once approved, the Summary shall be mailed to all individuals on the facility mailing list."

#### IV. RESPONSE TO COMMENTS

Several comments were received from the San Idelfonso Pueblo (SIP), which is immediately adjacent to LANL.

The following comments were received from SIP.

##### COMMENT #1:

##### General Comments:

The proposed permit involves many years of elapsed time and numerous reports which will be prepared for the EPA. The permit calls for informing the public but makes no provision for the detail or quality of information or how this is to be funded. We are concerned because the activities under this permit will span the administrations of numerous SIP governors and will require large resource and time commitments to track and assess the impact on SIP. Bureau of Indian Affairs (BIA) should be funded by the LANL to perform such an on-going assessment and the funding should be made a condition of the permit. Otherwise, SIP should be funded to support its own tracking and assessment of the reported results.

##### RESPONSE #1:

The EPA has no regulatory authority to force LANL to provide funding to other entities. However, the public participation portion of this permit has been modified to encourage LANL to outreach and apply unique solutions to public participation, as specified under Response #11.

##### COMMENT #2:

2. There needs to be provisions in the permit for notification of SIP in cases of releases or actions related to this Permit. SIP only became aware of the existence of this permit by accident and was not provided an early opportunity to comment. This does not indicate the free flow of information that we feel is necessitated by the type of operations covered under this permit.

##### RESPONSE #2:

The public participation portion of the draft permit has been revised to address these concerns, as detailed under Response #11.

COMMENT #3:

There is a general lack of description of the impact or penalty for non-compliance with the various sections of the permit. For assurance, in the eyes of concerned citizens such as SIP, that the enforcement will be credible and effective, there needs to be both a yardstick for measurement of compliance and a penalty for non-compliance.

RESPONSE #3:

Section D of the permit speaks to permit compliance. The mention of criminal penalties has been added to reiterate enforceability of the permit.

COMMENT #4:

Comments specific to permit:

Page 2. Section B Subsection 1 (b)

"the proposed method of treatment, storage, or disposal (of hazardous waste or hazardous constituents) is that method currently available to the Permittee which minimizes the present and future threat to human health and the environment."

Due to the extreme toxicity of the materials handled by LANL, special requirements such as double containment of storage tanks should be required to ensure minimization of threat to human health and the environment. In other words more attention should be given to prevention.

RESPONSE #4:

This section of the permit speaks to waste minimization, and has been expanded as detailed under Response #34. Attention will be given to prevention in that the Permittee will be required to comply with all of the RCRA standards, which includes containment.

COMMENT #5:

Page 2. Section B Subsection 4

"..Within 15 calendar days of discovery, notify the Administrative Authority of any release of any hazardous waste or hazardous constituent.."

A more appropriate requirement, as far as SIP is concerned, would be immediate notification in the case of airborne releases and notification within 24 hours of liquid or solid releases including steps taken to remedy the problem. This would act to reduce exposure time thereby reducing health effects. Also, immediate notification to a representative of the San Idelfonso Pueblo is needed so that they may take appropriate steps.

RESPONSE #5:

The Community Relations part of the permit has been expanded to include immediate notification of SIP by LANL in the event of a newly discovered offsite release. Section G has been changed to 24 hours.

COMMENT #6:

Page 7. Monitoring of Surface and Groundwater

"Extensive monitoring of surface and groundwater is now conducted and documented annually by the Permittee's Environmental Surveillance Program..."

EPA will review this program and plans to modify this plan if warranted. However, quarterly reports are needed for the special monitoring requirements addressed in the Permit (not now covered by the Annual Environmental Report of LANL) and should be made available for review by the Bureau of Indian Affairs and/or a representative of the San Idelfonso Pueblo.

RESPONSE #6:

Quarterly technical progress reports have been added as a requirement of the permit under Task V. These reports will be a required part of the information in the public repository, as specified in the additions to the Community Relations plan, Task II.D.

COMMENT #7:

Page 12. Section G. Notification Requirements For Newly Discovered Releases

Again, a requirement for notification within 15 days is provided for releases of hazardous waste into the environment, which is too long in most cases and makes no mention to what steps have been taken to remedy the problem.

RESPONSE #7:

As in Response #5, the permit wording will be changed to 24 hours. It is important to understand that releases covered here are from the old Solid Waste Management Units at the facility, not from present operations. Those releases are covered by other regulations, such as SARA Title III, and not within the scope of this permit. As to the steps to be taken to remedy the problem, the Administrative Authority may require such a plan.

COMMENT #8:

Page 12 Section H. RCRA Facility Investigation

Time allotment for preliminary reporting is 180 days. However, the Task/Site Workplans will not be 100% completed for eight years.

This time frame is excessive. Determining the nature and extent of the problem does not alleviate the problem, but merely defines the problem. In addition, LANL should take advantage of previous work done in these areas to shorten the time required for the identification and work plan phase.

RESPONSE #8:

The permit has been changed to require all RFI workplans to be submitted within four years rather than eight. The scope of the task of investigation and cleanup of this facility is such that it will take several years if done correctly. Most of the SWMUs have existed for many years, and are not known to constitute a present imminent hazard. Clean up work will be ongoing during later task/site investigations, with those sites which appear to be most environmentally significant to be addressed first. To be thorough in the investigations and cleanup is more important than rushing the process. Further work will build on previous work done, this is one rationale behind requiring the Preliminary report: DESCRIPTION OF CURRENT CONDITIONS to identify and summarize previous work.

COMMENT #9:

Page 35 Section D. Implementation of Interim Measures

Reports should also be given to the Bureau of Indian Affairs and/or SIP.

RESPONSE #9:

Interim measures must be reported here in the Preliminary Report which will be added to the documents which must be in the public repository as detailed in the expanded Community Relations Plan.

COMMENT #10:

Page 37 Section C. Health and Safety Plan

It is not clear how this differs from Health and Safety Plans that should already be in place at LANL.

RESPONSE #10:

This health and safety plan is for the RFI work, addressing the SWMUs, not for the daily operation of the facility.

COMMENT #11:

Page 38 Section D. Community Relations Plan

This section lacks specificity and could be met by issuing only superficial reports. It is a concern that SIP needs to be informed in a manner that is useful and meaningful to the SIP and not just in numerical data required by the permit.

RESPONSE #11:

Due to numerous comments on this section, the Community Relations Plan has been expanded to read as follows:

... The Permittee shall prepare a Community Relations Plan (CRP) as part of the RCRA Facility Investigation (RFI) Workplan which allows for public participation in the RFI process. The CRP will include:

1. Establishing an active mailing list of interested parties (to be updated annually) including those on the official facility mailing list who wish to be on LANL's list;
2. Informal meetings, including briefings and workshops as appropriate, with the public and local officials before and during the RFI process, which includes activities associated with the RFI Workplan and RFI report;
3. News releases, fact sheets, approved RFI workplans, RFI final reports, Permit Special Conditions Reports and publicly available quarterly progress reports that explain the progress and conclusions of the RFI;
4. Creation of a public information repository and reading room;
5. Updates of materials in the information repository and public reading room;
6. Public tours and briefings to inform and to listen informally to public concerns and answer individual questions;
7. Quarterly technical progress reports for the Administrative Authority; and
8. Procedures for immediate notification of the San Idelfonso Pueblo or other affected parties in case of a newly-discovered offsite release which could impact them.

COMMENT #12:

Page 42-43 Section C. Contamination Characteristics

No mention is made of means of controlling movement of a liquid plume.

RESPONSE #12:

This part of the permit gives specifics as to what the facility investigation must address. Control of plumes will be addressed under the Corrective Measures, or by interim measures if necessary.

COMMENT #13:

Page 46 Section C. Draft and Final

The final reports should also be made available to the BIA and SIP.

RESPONSE #13:

The Community Relations Plan includes these reports, as described under Response #11.

COMMENT #14:

Page 58. Task IX. Reports

Progress reports should be given to the Bureau of Indian Affairs and SIP.

RESPONSE #14

Same as Response #13.

THE FOLLOWING COMMENTS WERE RECEIVED FROM LANL ON MODULE VIII

COMMENT #15:

Section A.4. (p.1)

This section requires notice within 24 hours of any release from a solid waste management unit. Release is broadly defined and by its terms includes any quantity, even de minimus amounts with no potential for any significant impact on the environment or human health. An inordinate amount of time and effort may be required to report even trivial amounts. LANL requests that this definition be further refined to include some criteria for types and quantities of releases which must be reported.

RESPONSE #15:

Any release detected by RFI monitoring which is considered a statistically significant increase over the background data for the media of concern must be reported to the Administrative Authority, both verbally and in writing.

COMMENT #16:

Section B.4. (p.2)

This section appears to be mooted by the addition of the new sections F. and G. which also deal with notification requirements for discovery of, and releases from, newly-identified solid waste management units. Section B.4. contains provisions which directly conflict with Section F. and G. and LANL requests that it be deleted.

RESPONSE #16:

This section is redundant to sections F and G, and has been deleted.

COMMENT #17:

Section B. Perched Zone Monitoring (p.5)

This section requires the installation of the monitoring wells to be completed within 90 days of the effective date of the permit. LANL is informed that the permit will likely be issued in November. Although LANL will begin installation of the wells this fall, during the winter months, the canyons where the wells will be installed are largely inaccessible due to snowfall and winter conditions. Winter conditions are followed by spring runoff, and if there is significant snowfall, the canyons may not be accessible until May. The 90-day completion date is therefore unrealistic and LANL requests tht it be changed to 270 days from the effective date of the permit.

The last paragraph, second sentence should read, "238 Pu, and 239 Pu, 240 Pu" rather than "238, 240 Pu."

RESPONSE #17:

The 90 day timeframe is not changed. For any time schedule in this permit, LANL may request an extension, and if justifiable the Administrative Authority may extend the deadline up to 120 days pursuant to 40 CFR 270.14. The permit has been changed to read according to the second paragraph of comment #17.

COMMENT #18:

Section B. Monitoring of Surface and Groundwater (p.7)

LANL requests that the time period for submitting the summary describing the ongoing monitoring program, including sampling points, media, and constituents analyzed for be changed from 90 to 120 days from the effective date of the permit. The LANL Environmental Surveillance Program is extensive and complex and a thorough summary will take some time to compile.

RESPONSE #18:

The request is granted. It is more important in this case to get a thorough quality document, rather than adhere to the tight time deadline.

COMMENT #19:

Section B. Vertical Extent of Saturation (p.7A)

The last two sentences of this paragraph seem to require that all core material shall be analyzed for all constituents. LANL requests that this section be revised to allow for the exercise of professional judgement in determining the number of samples and subsequent constituent analysis during the investigation.

RESPONSE #19:

The wording has been changed to include these "as appropriate."

COMMENT #20:

Section B. Identification and Summary of Previous Studies (p.7A)

LANL requests that the time period for submitting the reference list be changed from 120 to 180 days in order to insure adequate time to compile a thorough and accurate list. Additionally, LANL suggests that the intent of the section would be clearer if it was revised as follows:

" Within 180 days of the effective date of this permit, the permittee shall develop and submit to the Administrative Authority, a reference listing of all known geologic, hydrogeologic, and all environmental studies previously performed at and/or by the facility relevant to potential contamination or migration of contamination from SWMUs, with a summary of the scope of the study and significant findings thereof."

RESPONSE #20:

The timeframe is not changed. See response #17.

COMMENT #21:

Section D. Corrective Action for Continuing Releases (p.9)

The second paragraph on this page discusses the consequences of failure to comply with plans and schedules and references 40 CFR 270.41 for guidance on modifications. It is not clear how the permit modification process will apply to LANL's annual update of the Installation RI/FS Work Plan which must be approved by the Administrative Authority.

In the fourth paragraph on page 9, LANL requests that the following sentence be inserted after the sentence "The ER Program strategy for dealing with the large number of tasks is to prepare a single installation wide work plan and task-specific RI/FS documents for each task":

"Depending on site-specific findings during the Corrective Action Plan process, a site within a task may be removed by a determination that no further action is necessary. A site may also be assigned, to a different task, for example, by implementing interim corrective measures. Either of these actions may be taken by the Permittee with the approval of the Administrative Authority."

RESPONSE #21:

The proposed sentences have been added.

Changes to this permit which will become necessary as work progresses, such as addition or deletion of SWMUs to be addressed, may be processed as major modifications to the permit. It is anticipated that all major modifications will be processed annually, after approval of the annual RI/FS workplan update.

The following sentence has been added to clarify the timing of the permit modifications: "Such changes will be processed as major modifications, as appropriate, annually."

COMMENT #22

Section H. (3) (p.14)

In the first paragraph, after the sentence "The scope of the RFI...from solid waste management units," LANL requests that the following be inserted:

"As appropriate and with the approval of the Administrative Authority, the RFI Work Plan will be developed and implemented using the phased approach as described in EPA Corrective Action Plan guidance documents. Information obtained during the preceding phase will be incorporated in the modified RFI Work Plan for the subsequent phase. The draft RFI Report shall be prepared when all phases of the RFI have been completed to the satisfaction of the Administrative Authority."

More than one phase will be required in most cases at LANL during the RCRA Facility Investigation to provide sufficient information for the Corrective Measures Study.

RESPONSE #22:

The proposed wording has been added to provide for approval of both phases of workplans.

COMMENT #23:

Section H. (3) (p.14-19)

Some of the SWMUs identified in this section already have closure plans submitted to the State of New Mexico or characterization information has been requested by the State of New Mexico. Based on the characterization results, a determination will be made by LANL and the state with regard to appropriate further action. A list of these SWMUs is provided below. LANL requests that these SWMUs be deleted from the permit in order to avoid unnecessary and costly duplication of effort.

0-001	6-006	18-003	36-003
0-012	6-004	21-003	36-005
3-001 (a-c)	9-005	21-011	39-002 (a)
3-001 (m)	9-007	22-005	39-004 (c,d)
3-001 (p)	9-009	22-006	39-006 (b)
3-001 (r)	11-002	22-010	40-001 (b,c)
3-013	11-004	33-002	40-005
3-014	11-005	33-004	41-002
3-020	11-009	33-012 (a)	46-002
3-028	14-004 (b)	33-013	46-003
3-033	14-005	35-004 (e)	48-002
3-037	14-007	35-009 (f-h)	48-002
3-039	15-003	35-010	48-003 (a,b)
6-001	15-006	36-002	50-001
	15-009		50-002
	16-003 (a-v)		52-002
	16-003 (a-f)		53-001 (a)
	16-006		53-001 (b)
	16-010 (a-g)		53-002
	16-12		53-006 (b-e)
			53-007 (a,b)
			54-001 (a)
			54-001 (c)
			54-003
			54-005
			54-007 (a-c)
			39-006 (b)

RESPONSE #23:

Attachment I of the State issued permit requires a characterization of all waste streams from buildings/Technical Areas (TA's). This attachment does not require investigations of SWMUs at these TA's/buildings, therefore the above SWMUs will remain in the permit. The following units have been removed from this section of the permit because they are RCRA regulated (under State authority) units undergoing closure.

- 16-008(b)
- 54-003(a)
- 54-004(shaft 9)
- 54-006
- 35-005(a&b)

SWMU #16-006(c) a septic tank, is deleted since it has received only sanitary waste from it's associated guard house. A new SWMU has been added to the list as number 0-023, a PCB contaminated area.

COMMENT #24:

Section I.1. (p.21)

This section is incomplete and appears to be superseded by later section L., M., N., O., P., and Q of the permit. LANL requests that it be dropped.

RESPONSE #24:

This section is redundant, and has been dropped.

COMMENT #25:

Sections J. and K. (p.22-23)

It appears that Sections J. and K. might be most logically placed after Section G., Notification Requirements for Newly Discovered Releases at SWMUs. Approval of the annually updated Installation RI/FS Work Plan by the Administrative Authority as required by Section H might also serve as a mechanism for the Administrative Authority to reach a determination of no further action for specific sites.

RESPONSE #25:

Sections J. and K. have not been moved. The annual approval of the updated Installation RI/FS Workplan is the logical mechanism whereby a determination of no further action may be made. Therefore, the annual permit modification and public participation may include determinations of no further action as items for discussion.

COMMENT #26:

Section L (p.23-24)

Task/site-specific bench-scale and pilot-scale studies are included in Section N, Corrective Measures Study Final Report, but not as a requirement for the corrective action measures study plan. The permit should clarify review, concurrence and reporting requirements for bench pilot studies.

RESPONSE #26:

The permit has been modified to include pilot or bench scale studies to be specific by the Administrative Authority or proposed by the permittee in the CMS Plans. All CMS Plans will be submitted to the Administrative Authority for approval, and reported in the CMS final report.

COMMENT #27:

Numerous comments were received from the public regarding radionuclide releases from the incinerator. (Not a LANL comment.)

RESPONSE #27:

The EPA Region 6 thoroughly researched the possibility of adding a requirement to monitor radionuclides from the incinerator. The Office of Regional Counsel and EPA Headquarters provided the opinion that such a condition is not within the authority of RCRA. If, in the future, Congress expands the scope of RCRA to include radionuclides, this permit may be modified to include such monitoring.

In addition, DOE is required to comply with the National Emission Standards for Hazardous Air Pollutants (NESHAPs) and 40 CFR, Part 61, Subpart H. These regulations require monitoring of radionuclide emissions from release points. Annual reporting of these emissions to EPA is required to determine compliance.

COMMENT #28:

Section Q., Summary (p.29-30)

Several changes are needed to make the facility submission summary schedule consistent with the text and LANL's requested changes.

1. Under notification of newly-identified SWMUs and newly-discovered releases the word "written" should be added.
2. Task I deliverables are due 180 days after issuance rather than 90 days.
3. The SWMU Assessment for newly-identified sites is due 90 days after receipt of a request is consistent with Section F.3, p.10, however it is inconsistent with Section B.4. (b) which contains a requirement of 45 days. LANL requests that Section B.4. (b) be changed to 90 days.
4. The SWMU Assessment Report is due 60 days after completion of the SWMU Assessment Plan, however, Section F.5. indicates that it is due in 25 days. The 60 day period is preferable.
5. The requirement that the Revised RFI Work Plan be submitted within 30 days of receipt of the NOD applies to the Installation Work Plan and the Task/Site Work Plans.
6. The RFI Report and Summary Report are due 60 calendar days after completion of the RFI. This requirement is not specified in the text.
7. The Interim Measures Plan is required 30 days after notification. There is no plan requirement specified in the text.
8. The requirement to provide a CMS Plan 90 days from notification to perform CMS is consistent with page 23, Section L., Corrective Action Measures Study Plan, but not with page 21, Section 1., Correction Measures Study, that the draft report be submitted within 90 days. The 90-day requirement for the plan is more reasonable than 90-day requirement for the report.

RESPONSE #28:

- #1 Agreed
- #2 Agree, 90 days was a typographical error
- #3 Section B.4.(b) has been deleted. See Response #16.
- #4 Since receipt of analytical results may take months, 60 days is granted.
- #5 Agreed
- #6 Task V: Reports D. has been expanded and clarified.
- #7 The permit condition I. Interim Measures has been modified to allow for Administrative Authority discretion in requiring an interim measures work plan.
- #8 Page 21.1 (a) was a typographical error. It now reads CMS Plan.

COMMENT #29:

Section R. Task 1.A.1.c. (p.33)

The request that the report include a "Topography (with contour interval of five (5) or ten (10) feet and a scale of 1 inch-100 feet), waterways, all wetlands, floodplains, water features, drainage patterns", is a significant task in terms of time and expense for a facility the size of LANL. LANL covers 43 square miles and is located on the Pajarito Plateau. The plateau consists of a series of finger-like mesas separated by deep eastwest oriented canyons cut by intermittent streams. The mesa-tops range in elevation from approximately 7800 feet on the flank of the Jemez Mountains to about 6200 feet at their eastern termination above the Rio Grande Valley. It is unreasonable and impracticable to require this information to be submitted within 180 days from the issuance of a permit. LANL believes that one year from the effective date is a more realistic timeframe to compile this information and requests that the due date be changed to allow one year for preparation of the maps.

LANL also requests that the features required to be include in the topography be more clearly defined, including a definition of the geographic area that needs to be mapped and definitions of floodplains and wetlands. Wherever the term wetlands appears in MODULE VIII it should be further refined to mean "natural wetlands." Additionally, the requirement that the maps be to a scale of 1 inch-100 ft. will result in preparing a large number of maps (approximately 400 standard-sized sheets to cover the entire facility), which currently do not exist. Some of the features requested exist on maps of different scales (e.g., 1 inch-500 feet), therefore, some flexibility should be allowed relative to map scale at the facility level. Detailed site-specific maps will be provided on a task-by-task basis displaying these features as appropriate during the RFI/CMS process.

RESPONSE #29:

Task 1:A.1.c. has been changed to read "Topography using available scales depicting waterways, wetlands, floodplains, water features, and drainage patterns."

Task III.B.1. has been added to read: "The RFI work plan shall propose the Task/Site specific maps with an appropriate scale and the following features; wetlands, floodplains, water features, drainage patterns, springs, faults, gravel deposits, and alluvium".

The necessary detailed information may now be generated on a Task/Site specific basis, rather than for the Preliminary Report.

As to the mapping only of "natural wetlands" it is possible that some of the manmade wetlands are significant and require mapping. A Wetland size of greater than one acre has been specified.

COMMENT #30:

Section R. Task I.A.1.h (p.33)

The requirement that the Preliminary Report include "A detailed geologic map overlain on contour map (contour interval at least 10 feet) with a scale of 1 inch = 400 feet depicting all units of the Tshirege member of the Bandelier Tuff be prepared" and that, "Maps must depict all springs, faults, gravel deposits, alluvium, and pumice deposits." is not reasonable. Depicting all units of the Tshirege member in Bandelier Tuff as requested will in many cases result in useless maps given the LANL topography. Additionally, it is not clear how development of such a costly map will benefit evaluation of the SWMUs. To the extent that this information is needed on a site-specific basis, it will be provided in the appropriate site-specific documents during the RFI/CMS process. However, if the Administrative Authority believes that the LANL-wide map is absolutely necessary, a due date of 180 days from the effective date of the permit is not reasonable. A due-date of 360 days from issuance of the permit is more realistic. The features requested (e.g., springs and alluvium) should also be defined in the permit, including minimum size of those features which require mapping.

RESPONSE #30:

Response #29 aids in addressing this comment.

The draft permit has been modified to require all these parameters on a site specific basis, (task III.B.1) rather than in the preliminary report. To artificially define in the permit the sizes of features to be mapped would be setting arbitrary limits. The site specific workplans must propose such parameters as appropriate to site specific conditions.

COMMENT #31:

Section R. Task VI.C.

Previously, in Section N., mention is made of pilot studies, however, this Section R. omits them. Additionally, the term "laboratory studies" is not defined.

Overall, MODULE VIII requires LANL to submit a great many documents to EPA for concurrence within short timeframes. LANL requests that EPA make available sufficient staff to review and approve these documents in a timely manner.

RESPONSE #31:

Pilot or bench scale studies may be specified by the Administrative Authority as added to Condition L.1., or proposed in the CMS plan as added to L.2.f. The term "Laboratory" studies is not meant to infer all studies performed by consideration of use at a specific site.

This concludes the comments submitted by LANL.

COMMENT #32:

A plan should be detailed and funded by LANL for independent oversight of the 20-30 year process. I suggest a group, including a health physicist, geologist, hydrologist, secretary, two researchers, and a community relations representative be funded. Representatives should also be included from the Pueblos, Hispanic and Anglo communities.

RESPONSE #32:

Comments #1 and #11 partially address this comment. LANL may choose, through its public participation process, to implement some of these suggestions, however, EPA does not have the regulatory authority to require such funding.

COMMENT #33:

I am concerned about independent oversight because as I understand the situation today, the EPA has designated one trip to LANL a year for this purpose, and our state's Environmental Improvement Division has allocated 1/2 to 2/3 of a full-time person to oversee this incredibly large project - 603 sites. I believe there should be an independent group based near LANL to work on this project daily.

RESPONSE #33:

Each Federal Facility is required by law to have at least one RCRA Comprehensive Compliance Evaluation Inspection per year, including LANL. Those EPA representatives overseeing the investigations and corrective actions will travel to LANL as needed, with travel funds permitting.

See response #1 concerning independent funding.

COMMENTS #34:

What plans does LANL have for source reductions, waste minimization and recycling at this time? What enforcement power does EPA have in this regard?

RESPONSE #34:

40 CFR 264.73(b)9 provides the EPA regulatory authority concerning waste minimization.

Section B.1. of the permit has been expanded as follows:

B. SPECIFIC CONDITIONS

1. The Permittee shall certify in writing, annually by December 1, for the previous year ending September 30, that:
  - (a) the Permittee has a program in place to reduce the volume and toxicity of all hazardous wastes which are generated by the Permittee's facility's operation to the degree determined to be economically practicable, and the proposed method of treatment, storage, or disposal is that practicable method currently available to the Permittee which minimizes the present and future threat to human health and the environment. This certified plan/program must address the following items:
    - (1) any written policy or statement that outlines goals, objectives, and/or methods for source reduction and recycling of hazardous waste at the facility;
    - (2) any employee training or incentive programs designed to identify and implement source reduction and recycling opportunities for all hazardous/mixed wastes;
    - (3) any source reduction and/or recycling measures implemented in the last five years or planned in the near future;
    - (4) an itemized list of the dollar amounts of capital expenditures (plant and equipment) and operating costs devoted to source reduction and recycling of hazardous waste;
    - (5) factors that have prevented implementation of source reduction and/or recycling;
    - (6) sources of information on source reduction and/or recycling received at the facility (e.g., local government, trade associations, suppliers, etc.);

(RESPONSE #34 continued)

- (7) an investigation of additional waste minimization efforts which could be implemented at the facility. This investigation shall analyze the potential for reducing the quantity and toxicity of each waste stream through production process change, production reformulation, recycling, and all other appropriate means. The analysis shall include an assessment of the technical feasibility, cost, and potential waste reduction for each option;
- (8) the Permittee shall submit a flow chart or matrix detailing all hazardous wastes it produces, by quantity and type, including mixed wastes, and by building/area and program if consistent with security considerations;
- (9) the Permittee shall demonstrate the need to use those processes which produce a particular waste due to a lack of alternative processes, available technology or available alternative processes that produce less volume of toxic waste; and
- (10) the Permittee shall demonstrate the applicability/inapplicability of the following minimization techniques:
  - a. A program that inventories the amount of contaminated lead that exists at the facility;
  - b. A program that substitutes steel for lead where possible;
  - c. If it is not possible to substitute steel for lead, the lead is coated with a strippable coating to prevent its entire contamination;
  - d. A program or bench scale method to decontaminate the lead;
  - e. Use of nonhazardous liquid scintillation cocktail solution; and
  - f. A program designed to prevent comingling of radioactive and nonradioactive waste.

COMMENT #35:

I believe this process needs to be delayed until the Environmental Assessment report has been finalized by LANL and provided to the public for their review so that more detailed testimony can be given based upon the information provided by this report as to the conditions at LANL at this time.

RESPONSE #35:

An Environmental Assessment is a part of an Environmental Impact Statement (EIS). It is EPA's position that a full RCRA/HSWA permit is "functional equivalent" to an EIS, therefore a separate EIS is not required. Additional language has been added to permit section VIII.D. clarifying this point. Note: See Alabamians for a Clean Environment V. Thomas, No. CV87-0797-W (N.D. Ala. Dec. 7, 1987). The current conditions at LANL are to be reported in the Preliminary Report. Descriptions of current conditions are specified in the permit. To continue to delay action at SWMUs while waiting for another report is not desirable, since more studies will always be forthcoming.

COMMENT #36:

I would suggest methods such as waste solvent distillation, reverse osmosis, separation of cyanide and ion exchange of metal plating solutions as alternative waste to recycle. What is LANL currently doing in these areas and will do under the Module VIII permit?

RESPONSE #36:

See Response #34. LANL will be required to submit this information in the annual workplan for approval.

COMMENT #37

What is meant by clean-up and where will the waste be placed?

How many EID and EPA inspectors will be assigned to clean-up?

RESPONSE #37

This permit provides a general outline of how the investigations and considerations of corrective actions must proceed under EPA's authority. It does not specify any clean-up method. Such methods will be proposed by LANL as appropriate to site specific conditions. It is likely that at LANL much of the waste will be remediated in place, without removal, or consolidated to fewer areas.

See Response #33 on EPA inspections.

It is understood by EPA that DOE and NMEID are currently working on an agreement to provide funding for State employees overseeing permit conditions. Such redistribution of funds is forbidden by Congress between two Federal agencies.

COMMENT #38:

How is information made available to the public?

- a) Will citizen groups be sent reports on the investigation?
- b) What are the parameters as to what the public "needs" to know?
- c) To what extent should the public be involved in the management and handling of hazardous and radioactive materials at LANL?

RESPONSE #38:

- a) See Response #11.
- b) All the information generated as a result of investigations of SWMUs will be made available to the public in monthly and quarterly reports.
- c) As far as the HSWA process is concerned, the public will have the opportunity to comment on any proposed remedy before it is undertaken.

COMMENT #39:

What "must" LANL do when it comes to waste minimization?

- a) To what degree must they minimize waste?
- b) Does waste minimization mean a new incinerator?
- c) Does LANL plan on pursuing recycling and source reduction?

RESPONSE #39:

The waste minimization requirements has been expanded as detailed under Response #34. A percentage or degree of waste minimization has not been specified, in a research facility such a requirement would be difficult to impose because of the many small waste generating experiments which would constantly change.

It is important to note that the term "waste minimization" as used in this permit refers to source generation reduction, and is in no way related to volume reduction from incineration.

COMMENT #40:

Are there enough monitoring wells mandated in the permit to adequately address all possible routes of contamination?

- a) Should wells be clustered together for more complete data?
- b) Should wells be placed at fence line for possible off-site data?

RESPONSE #40:

The permit RFI will require enough investigation to completely define the extent of contamination from SWMUs. This will be accomplished under the approved task/site workplans over time. As a special condition, at least 14 new monitoring wells are required in the lower reaches of 7 major canyons. These locations were chosen to detect any possible contamination in the shallow perched aquifer before it migrates off-site, and are located near the facility boundary.

The permit has been modified to allow the Administrative Authority to require more wells after the information from these initial wells is reviewed. Cluster wells can provide valuable information concerning vertical migration of contaminants, and may be required after the initial wells are installed.

COMMENT #41:

Should LANL be the ones to decide what is "statistically significant" when it comes to field monitoring and sampling?

RESPONSE #41:

All raw data will be available for review by the Administrative Authority as will workplans which must also be approved. Therefore, any statistical method of finding of "statistically significant" data will be subject to review and approval by EPA.

COMMENT #42:

Should Los Alamos have 15 days to notify the EPA after the discovery of new releases?

RESPONSE #42:

The permit has been changed to read "24 hours."

COMMENT #43:

Why isn't LANL told to install monitoring wells at the fence line so they could better determine off site contamination?

RESPONSE #43:

See Response #40.

COMMENT #44:

Are LANL's Environmental Surveillance standards up to RCRA's?

RESPONSE #44:

LANL will be required to meet all RCRA standards in the investigation and cleanup of SWMUs.

COMMENT #45:

Will LANL approve "Independent Monitoring" of the investigation, clean-up and incinerator emissions if they are asked?

RESPONSE #45:

See Response #1.

COMMENT #46:

Who decides economic feasibility concerning the clean-up? All testimony should comment and recommend changes on the permit.

RESPONSE #46:

Before any remedy is imposed, there must be a major permit modification with full public participation.

COMMENT #47:

Page 5, Section B, Special Permit Conditions, discusses the placement of perched-zone monitoring wells in the canyons above the Pueblo. When available, a map locating these wells would assist BIA and Pueblo personnel with locating these wells in relation to the wells currently monitored by LANL and BIA on the Pueblo lands.

RESPONSE #47:

A report requiring such a map has been specified in this section of the permit. All this information will be in the public information repository.

COMMENT #48:

Page 7, Monitoring of Surface and Ground Water, discusses the monitoring currently conducted and reported on in the LANL annual Environmental Surveillance Report. The permit monitoring is site specific and seems to be more comprehensive. Therefore, we recommend the reporting be at least quarterly for the results of permit monitoring and that the Pueblo and BIA both be copied with the reports.

RESPONSE #48:

The requirement for quarterly reporting has been added to the permit. Until the public information repository is set up by LANL, all reports will be available from the EPA.

COMMENT #49:

Page 9, Section d., Corrective Action for Continuing Releases, discusses proposal of a permit modification if corrective measures are needed. We request that the Pueblo and BIA be mailed any notice of a comment period or hearing.

RESPONSE #49:

All persons on the official facility mailing list will be sent all notices for hearing. Commentors who supplied addresses during the public comment period are on that list.

COMMENT # 50:

Page 38, Community Relations Plan, does not give specific information about the plan. Is it possible for the public and Pueblo to be informed via short reports that are in lay terms? Is the concept of a public information center at the LANL library a part of the Community Relations Plan?

RESPONSE #50:

The Expanded community relations plan detailed in Response #1 does require informal meetings, briefings and workshops.

Creation of a public information repository and reading room is also required.

COMMENT #51:

Page 40, Section A., Environmental Setting - Hydrogeology, discusses methods of describing the hydrogeology of the area. If any surface geophysics or infrared photography is available, this information should be included.

RESPONSE #51:

The following has been added as a new condition:

- h. An analysis of available geophysical information and remote sensing such as infrared photography and Landsat imagery.

COMMENT #52:

The comment received that the regulation of the cleanup should include all wastes, especially radioactive wastes.

RESPONSE #52:

The newly installed perched zone wells (required by Module VIII.B) will require monitoring of radionuclides. Also, all SWMUs required to be investigated under the permit, which had mixed wastes (or SWMUs which LANL does not know what was put in them) will be required to analyze samples for the appropriate radionuclides.

COMMENT #53:

More air quality stations should be established in the surrounding LANL area to help monitor our air. The filters at the stations should be changed at a regular basis.

RESPONSE #53:

Under LANL's environmental surveillance program, air sampling is done at 27 locations. Module VIII.B., Monitoring of Surface and Ground Water require LANL to submit to EPA within 90 days of the effective date of the permit, a summary of all ongoing monitoring points, including the media and constituents to be analyzed for. If EPA determines this monitoring program is not sufficient, then EPA may impose additional monitoring requirements. Also, during investigation of the SWMUs, air monitoring will be required on a site-by-site basis.

COMMENT #54:

More ground water samples should be mandatory off the LANL's official boundaries.

RESPONSE #54:

See Response #40

COMMENT #55:

The U.S. Geological Survey should continue their study and be included in monitoring of soils and ground water contamination.

RESPONSE #55:

Under the permit, EPA does not have the authority to require the Geological Survey to continue their study. However, EPA can require LANL to include all pertinent investigation work done by the U.S.G.S. that is applicable to the permit to be included in the LANL Environmental Surveillance Report.

The following sentence has been added to the permit under the section titled, "Monitoring of Surface and Ground Water", of the permit.

"Any pertinent investigation work done by the U.S. Geological Survey that is applicable to this module shall be included in the LANL Environmental Surveillance Report."

COMMENT #56:

Off-site studies should be done to check for air, ground water and soil contamination by independent sources.

RESPONSE #56:

Presently, LANL is monitoring the air, surface, ground water, soils, sediment, and foodstuffs at various locations off the facility boundary under the LANL Environmental Surveillance Program. Also, Module VIII.B requires LANL to submit this information to EPA within 90 days of the effective date of the permit. Also, see response #53.

During the investigation of the SWMUs at LANL, EPA Region 6 or an EPA contractor will split samples with LANL periodically. This may include splitting samples of any off-site monitoring LANL does.

COMMENT #57:

The Bandolier National Monument should be continually monitored for all of the above. The high visitation rates of this park are putting many naive visitors at a health risk.

RESPONSE: #57:

See comments #1, #11 and #33.

COMMENT #58:

Inspections by EID and EPA of one time a year is not adequate. I feel during the clean-up phase LANL should be monitored daily. If funds do not allow a special government grant should be given. Citizen groups should also be involved.

RESPONSE #58:

See responses #1, 32, 33 and #11.

COMMENT #59:

Module VIII 15 is obviously a product of a lot of thought and research, and reflects a practical and conscientious approach to contaminated sites at LANL. It provides for a process for investigation and cleanup of Solid Waste Management Units (SWMUs) about which, in many cases, very little is known. Perhaps in part because so little is known about some of these SWMUs, Module VIII is very vague in many crucial respects, and this is its greatest weakness. For while much is not known, much is known, and Module VIII has not used this existing knowledge to produce clear regulatory requirements.

While Module VIII offers a finely honed process, hardly any content (other than this process) is specified. It offers what appears to us to be a rather complicated and tangled web of investigative and remediative steps which will ultimately proceed for a generation or perhaps longer without establishing clear criteria for success. It is a process to produce plans for investigations which will produce studies for remediation alternatives, and so on. While we applaud the thoroughness of this process, we note that the actual tasks to be done are hardly specified, and the actual implementation of corrective measures is not specifically mentioned. We believe this approach will cause the actual decisions governing cleanup to occur without effective input from the public and in all likelihood without effective input from either Federal or State regulatory agencies as well.

To put it another way, Module VIII defers nearly all the major decisions about remediation (not be mention the expenses relating to remediation) to the distant and uncertain future, where they may well be made in reference primarily to complex and soon-to-be-entrenched institutional and career objectives. The main thrust of the Module VIII process appears to be reports; actual remediation (to the extent it occurs) will be a fortunate byproduct, it appears to us.

We therefore suggest that Module VIII be rewritten to incorporate much more specific requirements for action, based on what is already known about the site and on explicit regulatory decisions (e.g. concerning cleanup standards, about which we will offer some suggestions below).

RESPONSE #59:

What is specified in this permit are workplans leading to Investigations, which will lead to Corrective Measures. To call for a specific corrective measure without adequate knowledge of site specific conditions would not be prudent. These hundreds of SWMUs will require differing Corrective Measures, and without this methodical, step-by-step process, Environmental Protection cannot be assured. As to effective input from Regulatory Agencies and the public, all workplan and proposed corrective measures must be approved by the Administrative Authority, and all proposed corrective measures will be subject to full public participation under RCRA.

COMMENT #60:

The procedures given in Module VIII ensure, we suspect, that the EPA will be kept at arm's length from the site. A regulatory process, however careful, cannot replace detailed, personal knowledge of a site by the regulator. The regulated parties will, with Module VIII as it is written, be gaining virtually all the intimate experience at the site, and the EPA will be kept in a decidedly inferior position as for as detailed knowledge is concerned. While it makes sense for the EPA, a publicly-funded agency, to not subsidize private industry by doing investigation and analyses for them, this approach makes much less sense when the regulated entity is also a publiclyfunded agency. The DOE needs to provide adequate funds to EPA to allow an adequate regulatory presence in this case, and Module VIII should be rewritten to give EPA greater responsibility in design and oversight of investigations, in design or remediations timetables, criteria, and strategies, and in enforcement. We believe EPA (not its contractors) should develop and maintain its own long-term institutional memory about this project--a memory not residing in just one or two people--and that this knowledge should be developed and maintained in partnership with the State Environmental Improvement Division (EID). It would be appropriate, we believe, for the EPA to place personnel in or near EID's Santa Fe office on a semipermanent (and perhaps rotating basis); we do not think that opening an EPA office in Los Alamos itself would be advisable.

RESPONSE #60:

The intent of Congress in forming the RCRA program was that facilities carry the burden of investigations and clean-up, and unlike the Superfund program which could afford such oversight mentioned above, RCRA has very limited funding for such oversight. Requests for funding for increased oversight specifically at LANL have been denied by EPA headquarters. It is the responsibility of Congress to appropriate such funding.

COMMENT #61:

Module VIII lacks remediation criteria. Without these, there is insufficient context even for the design of investigations, because it will not be clear to the investigators what is or might be significant (no matter how carefully it is spelled out) and what is not. It would be far better for all the parties involved to discuss these criteria now than for site-specific criteria to be quietly proposed by DOE one at a time over a number of years. We feel these criteria should:

- a. include protection of the environment in addition to protection of human health, which environment naturally includes all the LANL sites;
- b. involve compliance perimeters which tightly circumscribe the existing contaminated areas (present DOE and LANL philosophy is, often, to refer exposures to the facility boundary, which boundary should, we believe, play little part in remediation decisions);
- c. provide for containment of all waste these perimeters for the lifetime of the waste, or as much containment as can be achieved with the best available technology;
- d. provide for the removal, treatment, or other mitigation of waste bodies for which containment for the lifetime of the waste cannot be achieved; and
- e. include exposure limits which are as low as practicable.

We recognize that these criteria are somewhat vague and incomplete but they are offered here as an indication of the direction we think EPA should be heading. We are sure that with further work you will be able to improve on the ideas given here (and throughout these comments).

RESPONSE #61:

All site-specific criteria proposed by DOE will be subject to review and approval by the Administrative Authority and all proposed corrective measures will be subject to public comment before incorporation into a revised permit.

COMMENT #62:

The regulatory environment of Module VIII is one that is fractured into a number of jurisdictions--concerning RCRA waste, mixed waste, Atomic Energy Act-exempted materials, etc--and EPA, EID, and DOE should formalize their mutual intent to remediate all these categories of hazards together in one open process.

RESPONSE #62:

The fractured jurisdictions is the result of Congress passing different legislation allowing different agencies to govern radiation and hazardous waste requirements.

COMMENT #63:

Module VIII should contain a schedule for the implementation--not just the selection--of corrective measures. As it now stands, Module VIII calls for a great deal of research, in principle no different than the research LANL has been doing for years on waste management. LANL is a research establishment, and will have to receive strong encouragement to commit any significant monies to remediation projects that are not just research, particularly if those projects throw an economic shadow on current disposal practices, let alone on local real estate values. Already there is contempt in many LANL circles for what is termed there "bulldozer technology;" which may unfortunately mean any practical geotechnical stabilization techniques which do not result in research grants and scientific career advancement. It is quite possible, perhaps likely, that a billion or two billion dollars can be spent over the years without an effective remediation program--all in the name of thorough research.

We believe that the investigation schedule you have outlined is too slow. Speeding up this schedule--to, say, twice its current pace--would accomplish several objectives: 1) it would require the Lab to commit greater resources to the problem and thus lend the project greater political acceptability within the Lab, making it more likely that difficult remediation alternatives be seriously considered; 2) it would make urgent historical research more timely; 3) it would make effective public participation more likely; 4) it would arrange regulatory decisions densely in time, before the inevitable accommodation, familiarity, and job exchange occurs that are the hallmark of all long-term regulatory relationships; and 5) the commitment of resources concerning current waste practices. The main countervailing consideration, assuming three or four years are allowed to physically do the investigations, is primarily regulatory staffing level, a problem you will have to address creatively in any case. We urge you to examine this issue carefully.

RESPONSE #63:

It is true that this permit does not contain schedules for the implementation of specific corrective measures. However, any Interim Measure deemed necessary can be specified at any time.

The schedule in the permit for the hundreds of SWMUs was considered to be the most rigorous schedule reasonably achievable without jeopardizing the quality of work. Acquisition of resources by LANL was not a consideration. The schedule may be revised by EPA at any time as a permit modification.

A new permit condition Section H(3)e, has been added to require all CMS plans to be submitted within 10 years.

Also, the permit has been changed so that all RFI workplans are due within 4 years, rather than 8 years.

COMMENT #64:

[2,B.1.(a)] This requirement apparently only reiterates RCRA's general waste reduction requirement, and should be made specific by EPA to LANL. Since radioactive and mixed waste containing longlived transuranics and highly-mobile tritium is still being land disposed at LANL, and since the long-term safety of land disposal at LANL is still, we believe, unknown, this waste-reduction requirement is especially important.

We think the intent of this requirement would require, at an initial minimum, that LANL prepare a flow chart or matrix detailing the wastes it produces, both a) by quantity and type, including all radioisotopes and if consistent with security considerations, b) by building/tech area and program.

RESPONSE #64:

This comment has been added to the expanded waste minimization of B.1.

COMMENT #65:

[5,B.] The system of monitoring wells and boring proposed for the perched zones in the canyons appears, at first examination, to be far from adequate. Can it be that one to three wells and/or borings are sufficient to characterize these aquifers and delineate the vertical and horizontal extent of any contamination in them? LANL has for many years done hydrogeological background studies and be of sufficient detail to create a firm basis for remediation decisions. In no case should modeling or theoretical studies take the place of a full and unimpeachable set of empirical data, when that data can be physically collected.

The canyons investigated should include all those which have anthropogenic as well as natural aquifers. Also note that ephemeral aquifers in canyons, while difficult to study, are a principle source of ground water recharge, and hence of possible waste constituent mobilization, in this region.

Utmost care should be taken to avoid introducing into the sampling zone materials (e.g. bentonite) which might be capable of absorbing waste constituents.

RESPONSE #65:

The 14 wells specified under the Special Permit Conditions are not intended to fully characterize these aquifers but rather to quickly determine if contaminated ground water is migrating off-site.

Page 21, third paragraph of the draft permit speaks directly to the integrated hydrological studies of each of the canyons.

COMMENT #66:

3. (7., 1st para.) Without further study we cannot be sure that existing LANL monitoring of the main aquifer is sufficient to "demonstrate protection of the main aquifer," although we too believe this monitoring should be continued. It is known that there is infiltration through the waste at LANL; it is not known where this infiltration goes, how fast it goes, or what its significance is.

RESPONSE #66:

The purpose of the Site Specific investigations is to determine the complete extent, nature and magnitude of releases from SWMUs. The special condition requiring an investigation of the vertical extent of saturation will also provide important information.

COMMENT #67:

4.(7., 2nd para.) While concurring in the spirit of this requirement, we feel it is nevertheless not sufficient for LANL to "attempt" to ensure containment of all residual sediment contamination within the facility boundary." How can this be enforced? How hard must LANL "attempt" to do this and for how long?

RESPONSE #67:

The word "attempt" has been removed.

COMMENT #68:

5.(7a., last para.) We agree that it is necessary to determine the properties of the tuff, both intact and as crushed and emplaced, and in various locales corresponding to SWMUs and to variations in tuff welding. LANL has done considerable work of this type already, but much of this work has been done in a scattered sort of way--e.g. with only a few samples, extrapolating results into the range of interest with theoretical predictions, without statistical analysis, etc.--and some of it is almost anecdotal. At the same time, there are problems associated with determining extensive properties of the formations from cores alone. The point we are making is that EPA should require that these determinations be done with greater care so that the data obtained can serve as a common starting point for all future discussions about leaching, remedial design, etc..for the SWMUs.

RESPONSE #68:

It is important that data can be correlateable and comparable between sites. The Sampling and Field measurements section of Task II.A. Data Collection Quality Assurance Plan which must be approved by EPA will outline the steps to be taken.

COMMENT #69:

(7b., last para.) Not only should summaries of all past studies be provided to the Administrative Authority, in this case the EPA, but also to the State EID and to citizens' organizations like ours. This should be true for all submittals; it will not be possible to have meaningful consultation with the State or meaningful public participation without giving working copies of reports to these parties. Where significant volumes of data are involved, or where digitized maps are involved, it will also be important to give this information to interested parties in magnetic form as well. It will be very much in LANL's interest to reduce the climate of mistrust that now hangs over LANL, as it does over DOE facilities nationwide.

RESPONSE #69:

The expanded public participation detailed in Response #11 requires all reports to be in the public repository. EPA and LANL are each in the process of acquiring ARCINFO computer capability, which will allow for transmittal of maps and raw data to EPA by computer.

If interested parties have the capability to use this magnetic information, it may be requested.

COMMENT #70:

(8., 2nd para.) Please note that the framers of RCRA and the authors of 40 CFR 264. require "corrective action...to protect" not just public health but also the "environment." We believe that "the environment" does not begin outside the (ephemeral) facility boundary, but instead includes everything inside that boundary as well, as noted above. We encourage your to formalize this in your permit wherever you can.

RESPONSE #70:

This paragraph does say.."corrective action as necessary to protect human health and the environment for all releases...from any SWMU..." For purposes of this permit, releases from SWMUs begin at the SWMU and not at the facility boundary.

COMMENT #71:

(8., 4th para.) RCRA carries criminal penalties for falsification of information submitted to the Administrative Authority, doesn't it?

RESPONSE #71:

Yes it does. See comment #3

COMMENT #72:

(19., priority SWMUs) Area G is a SWMU which is actively receiving radioactive waste--waste which we believe still includes occasional high-level as well as low-level and (stored) TRU waste. It should be one of the highest-priority SWMUs.

RESPONSE #72:

Area G is covered under the priority SWMUs, Table B. It is Number 54-003 (A-B).

COMMENT #73:

(20., para. 4 part ii) EPA and EID must be able, not only to split samples, but to themselves sample at any time and any place. And this should from time to time be done, which argues for a New Mexico EPA office capable of projecting a regulatory presence toward LANL.

RESPONSE #73:

Section 3007 of RCRA gives EPA the authority to enter facilities and conduct sampling.

COMMENT #74:

(23., 5th para.) The language "given site-specific exposure conditions" undercuts the broader language of 40 CFR 264. quoted above. "Environment" is not another word for public health.

The criteria for requiring corrective measures studies must include the possibility of releases over the lifetime of the wastes, not just past or current releases and risks.

RESPONSE #74:

This language does not undercut the language of 40 CFR 264.101. Site specific conditions must be understood in order to determine if a threat exists. The permit wording does read "...human health and the environment..."

The words "...or may present a threat over the lifetime of the wastes," have been added in response to the second comment.

COMMENT #75:

Absent from this list are climatological studies. Water balance scenarios worked out by the State EID, together with past LANL studies, show that in wet years, significant infiltration can and does occur. Furthermore, the potential for infiltration varies significantly over the LANL reservation, according to weather data. Have more detailed empirical studies of water balance been conducted? If not, perhaps such studies should be incorporated into an early phase of this overall investigation.

The geologic map you mention apparently already exists in unpublished form and should not be difficult to produce.

RESPONSE #75:

Permit Condition Task III.A. Environmental Setting 2. Soils, requires several investigations relating to soil moisture and movement. A new condition has been added: "r. water balance scenarios".

COMMENT #76:

(37., Task II.B) This is a sound requirement; LANL should be required to furnish data in a form that is easy to update and summarize to both the State and to citizens' groups as well as to EPA.

RESPONSE #76:

See Comment #11

COMMENT #77:

(24., 1st para.) The "overall objectives," "remedy standards," and "schedules for conducting...study" mentioned in items b,c, and d do not appear in Module VIII; is LANL to propose these? These vital matters should not be proposed by the regulated facility but should be in EPA's draft permit requirements and available for public comment. To hand over these vital matters to the regulated entity, without guidance, is to hand over the heart of the regulatory process, we believe.

RESPONSE #77:

To specify objectives, remedies, standards, and schedules for a corrective measures study is not possible until the problem has been defined.

COMMENT #78:

(25., 0.1.) Does the phrase "further releases that might pose a threat to human health and the environment" imply that there are releases of hazardous materials which do not pose a threat to the environment?

(25., 0.2.a.4) "Institutional controls" may not be relevant for long-lived radionuclides.

RESPONSE #78:

This section has been deleted.

COMMENT #79:

Finally, I feel that when the current laws and regulatory authorizations inhibit the laws themselves from functioning to protect the health and safety of the public, then the very purpose of the regulatory process is defeated. After much study and research, I truly believe that incineration either chemical or radioactive, whether it's mixed or separate, is the wrong way to handle it. I would encourage the alternative of supercompaction, and increasing research into other alternatives to incineration. It's just too easy for this matter to get into the air, and that is utterly too dangerous.

RESPONSE #79:

EPA considers waste minimization as minimizing waste at the source, incineration is not considered waste minimization but volume reduction. NMEID retains authority over use of any hazardous waste incineration at LANL.

COMMENT #80:

Once again, I attended the EPA hearings regarding clean-up at Los Alamos, and dutifully read the material there provided by LANL/DOE. I have two comments: 1) The material is very difficult for the average person to understand, and creates more confusion for the reader than clarification; 2) many different laws and regulations are referred to in the material, but the over-all impression I received is that the DOE will implement or abide by "only what is required under existing regulations". DOE should be using every resource or means at their disposal to go "above and beyond" the call of duty to handle their wastes so that the public is protected. This should be their first priority.

RESPONSE #80:

In this permit, DOE is to comply with the regulations/statutes of RCRA, which deals with the proper handling of hazardous waste and any required investigations. RCRA is only one of several EPA waste programs which LANL must comply with.

COMMENT #81:

Since the underground water flows from LA mesa to springs along the Rio Grande, I was wondering if you run water tests on each of these springs? It seems to be important and also easier than drilling a well, what with the chances of allowing toxins to move through the drill sites as time erodes them. If these springs are presently tested, would they be listed in pps. 237-264 of the Lab's 1987 Environmental Surveillance document? Will you please have them tested regularly and include the results in future documentation?

RESPONSE #81:

The results of the springs being tested will be reported to EPA annually under Permit Condition VII.B., Monitoring of Surface and Ground Water.

COMMENT #82:

Please require tests of air, soil, water, plants and fish from areas north and NE of LANL, and in all directions in concentric circles out to major mountains. And test for all the heavy metals, radionuclides, and other toxins known to be emitted from them.

RESPONSE #82:

Onsite and offsite testing is already being conducted and reported to EPA annually under Permit Condition VII.B., Monitoring of Surface and Ground Water, and may be expanded if EPA believes other areas are affected by releases from SWMUs.

COMMENT #83:

Since the cancer rate is up for the city of Los Alamos, and as more of the citizens and laboratory workers are aware of dangers involved in their little corner of the world, a "Whistleblower's '800' Number" needs to be posted on every bulletin board in the laboratory complex and in the local newspaper.

RESPONSE #83:

The expanded public participation detailed in response #11 will provide more opportunities for communication. If anyone wishes to report an environment problem of a civil or criminal nature, they may call the EPA Region 6 office in Dallas.

COMMENT #84:

Since the EPA has jurisdiction over mixed waste streams, it is my desire that all 1300-1800 other dump sites be inspected to detect even the smallest amount of hazardous waste that may be mixed with the radio-active portions, and appropriate decisions made as to their final fate.

RESPONSE #84:

All sites for which there were no records or it is not conclusively known what wastes went in them have been included in the permit for investigation. Other sites will be added to this permit as they are discovered. EPA can add a SWMU whenever it deems necessary.

COMMENT #85:

10. In the arena of public relations, it is obvious the public gain more directive control in the decision-making at LANL. The "National Security" excuse is responsible for the poison in our land, takes away our security and, in fact, creates insecurity. Many of us are no longer afraid of terrorists or other forms of foreign aggression. Our own government is the terrorist and aggressor, with by-products of perilous living conditions and nightmares.

RESPONSE #85:

See Response #11

COMMENT #86:

I would like to see instructions for recycling methods and toxic minimization included in the permit. If the EPA is unable to give instructions for recycling methods and toxic minimization, then LANL should be required to develop these methods and provide the funding to recycle and minimize toxicity prior to creating further toxic waste.

RESPONSE #86:

See Response #34

COMMENT #87:

[33., Task 1.a] Topographic maps should be prepared at very close contours (e.g., 1-2 feet), in most, if not all cases. Existing 5-10 foot contour maps are not adequate to study surface drainage and reportedly include errors (e.g. contouring of tree-tops).

RESPONSE #87:

The site specific maps required by Task III.B.1 are required to be of the appropriate scale.

COMMENT #88:

[40., 1st para.] It must be made very clear, again, that the relevant time-frame against which contaminant movement and possible risks there from are to be evaluated is the lifetime of the wastes involved.

RESPONSE #88:

The words "or the potential releases for the lifetime of the wastes involved," have been added to the first sentence.

COMMENT #89:

[44., Air Contamination] Absent from your list of investigation requirements is a consideration of airborne releases which might occur in the future.

RESPONSE #89:

A new condition has been added: "d. Possibility of future airborne releases."

COMMENT #90:

[49., Task VI.B] We are not sure why the permittee should be devising the site-specific corrective action objectives, and why these objectives are not themselves constrained by facility-wide objectives that are explicit in this Module.

RESPONSE #90:

Site-specific corrective action objectives are, of course, constrained by facility-wide objectives, and must be established on a site-specific basis according to the specific conditions at a site.

COMMENT #91:

I'm particularly concerned about the level of detail in the monitoring part of the plan, and I believe page 5 is where the perched zone well sites are identified. I work for a much smaller organization in Los Alamos, many of you are aware of that, but I don't believe that you can provide quality, statistically significant data with a single monitoring well.

The monitoring wells should be clustered and nested to provide both horizontal and vertical control at individual locations and that there should be upstream and downstream wells built to RCRA standards, OTET, and indeed the single well as a minimum is not adequate to do that in my experience in providing some multiple wells drilling and better coverage of the sites of concern would be appropriate in the permit.

RESPONSE #91:

As covered in response #66, the Special Conditions wells are intended to quickly determine if contaminated water is moving offsite. The complete extent of saturation and contamination will be completed under Task/Site specific work.

COMMENT #92:

As it is, the criteria for success are something that's going to gradually emerge on a side-by-side basis. The criteria for success are actually going to be proposed by the regulated entity, as I understand it, sometime in the future which seems to me to be not a very effective way to plan a cleanup.

RESPONSE #92:

It is correct that the criteria for success will be proposed by the Permittee, but the proposal generated the Permittee must be thoroughly reviewed and approved by EPA. It is likely that some proposals EPA will disagree with and other proposals will be acceptable. But in all cases, the selected remedy and criteria for success will require a public notice, and if desired by the public, a public hearing.

COMMENT #93:

Until relatively recently, there just weren't very good controls on where many kinds of waste went. I'm very concerned that Area G, some parts of which are still inactive, radioactive waste landfill will fall through the cracks in this process.

RESPONSE #93:

All units (SWMUs) in which LANL could not fully characterize and document what wastes went into the unit, will be handled as SWMUs containing mixed wastes and will be required to be investigated under this permit.

COMMENT #94:

I'm thinking specifically, of course, about plutonium. The problem is to separate it from its mixture with hazardous chemicals and suppose that the technology which the permittee, LANL, proposes to treat mixed waste is not appropriate because it allows for venting of plutonium into the environment. Where in the permit does it say "We don't do any processing; we will just repackage it."

RESPONSE #94:

The investigating of all SWMUs will require, in the workplan, all possible dangers that could result from a particular SWMU. Those SWMUs that the Administrative Authority deem for further remedy will require a public notice and a possible public hearing if requested.

COMMENT #95:

I'm not a Missouri native, I did go to College at Washington University, but I do believe the "show me state" theory does apply here and that if indeed all of the sites should be eliminated, and indeed there is a data to support that, that ought to be provided directly to interested parties.

RESPONSE #95:

See Response #11

COMMENT #96:

A cooperative community involvement system is a much rarer commodity than a permit and if indeed the Lab is going to be making a commitment to community relations -- page 38, Item D at the bottom of the page -- then that section of the permit should be where some of these commitments are found.

RESPONSE #96:

See comment #11.

COMMENT #97:

One of the technologies used at Rocky Flats was aerial infrared photography and such technology could be included in the Los Alamos permit. If indeed operations are as described by Ken Hargis, then there should be no unacknowledged stacks and that documentation should indeed confirm a lack of a problem that has been the basis of the Lab's assertion since that Rocky Flats episode, but infrared probably would be best not to be announced.

RESPONSE #97:

The EPA Environmental Monitoring Systems Laboratory is available for EPA to take aerial infrared photographs, and may be used for enforcement or surveillance purposes.

COMMENT #98:

One of the elements I also feel should be incorporated into the permit and is responsive to Mr. Hargis's statement earlier is his reference to the 10 to 30 percent of appropriate standards as exposure levels. Ken, for those of you who don't frequent EID proceedings, is a former radiation protection bureau chief at EID and he's familiar with a principle called ALARA, "as low as reasonably achievable." That is the process, I believe, that should guide the cleanup and waste management technology applied at Los Alamos or other RCRA permitted facilities, that being a tenth of a standard relies on the standard for assurance.

As low as reasonably achievable requires the permittee to demonstrate their performance is at a maximum level. I believe that that's an appropriate standard to help a waste generating facility to, even if it is one of the oldest and greatest of research installations in the 20th century.

RESPONSE #98:

See Comment # 82.

COMMENT #99:

Providing documents at no cost, providing resources to organizations so that they can participate in a full, formal and technically sophisticated manner is going to be essential to allow the public to engage with Los Alamos on a playing field. I'm not looking for a level playing field; I'm just looking for some assistance as a public interest advocate and as a person who's talked to a number of different organizations that would be interested in participating if they weren't required to go out and hire an extensive technical staff on a multi-generational contract.

RESPONSE #99:

See Response # 11.

COMMENT #100:

I would certainly request that EPA not accept the comments of Los Alamos to limit monitoring sites before we move solid waste management units from the permits, as was part of the request provided by Ms. Brown.

RESPONSE #100:

EPA is required to respond to all comments submitted during the public comment period and the public hearing. EPA is not however, limiting monitoring sites, nor will SWMUs be deleted from this permit without justification.

COMMENT #101:

I think that the monitoring wells should have a secondary part and that is that there is heavy contamination in the canyon with the monitoring wells, that they go further down towards the fence line so that the monitoring wells do indeed detect contamination and they move down towards the fence line to see if the contamination is going to be moving close to offsite.

RESPONSE #101:

See Responses #67 and 40.

COMMENT #102:

I'm not real familiar with the size of Los Alamos, but I'm sure they could use more monitoring. I also feel that the wells should be grouped. I'm not a scientist, but I feel that one well might not do the job. If you're going to put wells out there, I think there should be more and it's my understanding that Los Alamos feels that there should be less. Some canyons are inaccessible in the wintertime, but I don't think that's very relevant.

RESPONSE #102:

See Response #40.

COMMENT #103:

I also don't think it should be LANL that -- well, I guess the economic feasibility is the main thing and I would like for that to be brought into the community involvement groups so that the statements that LANL makes on economic feasibility can be gone over by people who don't get their pay check from LANL.

RESPONSE #103:

All Corrective Measures work to be done on any SWMU will require a public comment period and a public hearing if requested by the public, at which time anyone may review and provide comments on the plan.

COMMENT #104:

I don't know if it's possible, but I would like for the permit to address some changes in the Atomic Energy Act. I don't know if this is the proper route to go about changing the Atomic Energy Act, but the DOE is so interested in the public image right now that I think it's important that they speak to the Atomic Energy Act because I feel that's the root of the problem. It doesn't give any state agencies the ability or federal agencies to have any regulations to deal with radionucleides besides the Atomic Energy Act.

RESPONSE #104:

The permit is not the proper route in which changes to the Atomic Energy Act (AEA) can be made, since the permit is under RCRA authority. The proper route to change the AEA would be through congressional legislation and the rulemaking process.

COMMENT #105:

I think not only the health problems of LANL employees need to be thoroughly studied and made public by outside observers, not by LANL staff, but the entire environment needs to be studied and made public. What has happened to the wildlife population, the water, the soil, the air and the ozone, since LANL was set up?

RESPONSE #105:

The RFI Workplan required under the permit requires that a Health and Safety plan be included to ensure worker safety while investigating the SWMUs. In addition, the annual monitoring reports detail studies on areas in and surrounding LANL.

COMMENT #106:

Moving backwards, page 43, under "Soil contamination," most of the contamination at LANL is going to be soil contamination and this part needs to be looked at very carefully.

RESPONSE #106:

A more detailed program on the characterization of the soils and rocks is found in the permit.

COMMENT #107:

The part "e., An extrapolation of future contaminant movement," this is very important and worse case scenarios need to be developed that address time spans that are commensurate with the hazard life of the constituents in the SWMUs.

RESPONSE #107:

The above suggestion will be included in the permit and read as follows:

"e. An extrapolation of future contaminant movement that includes worst-case scenarios over the life of the wastes involved."

Note: The public will be allowed to comment on any SWMU which is determined by the Administrative Authority for further Corrective Measures.

COMMENT #108:

Moving back again, page 41, under "Soils" and characterization of them, "Item d., Saturated hydraulic activity," there needs to be -- most of the flow in the soils is going to be occurring under ephemerally saturated and unsaturated conditions. There needs to be a fairly serious research effort to define the unsaturated flow properties of these systems.

RESPONSE #108:

Special permit conditions of Module VIII require LANL to determine the vertical extent of saturation. EPA realizes the importance of unsaturated zone monitoring at this site, and has included a special permit condition to require continued research in this area.

COMMENT #109:

Page 37, under "Data Management Plan," many people have said this needs to provide for dissemination to the regulatory agencies and the public so that everyone can work from a common database. The only thing I can add to this is that this is the last part of the century and it's important to pass on the magnetic form, the diskettes in compatible form so that groups can not just be inundated with paper, but let's work from common diskettes and databases.

RESPONSE #109:

The permit requires two hard disk copies and one compatible disk copy of all RFI reports be submitted to the Administrative Authority. The Public may obtain this information from the EPA.

COMMENT #110:

Page 23, again there's some language that kind of worries me because it may reflect the general feeling, a general kind of philosophical orientation to this document and to the process and it could be a problem. It says "L, Corrective Action Measures Study Plan". The sentence is, the last part of the sentence is "or if the Administrative Authority determines that contaminants present a threat to human health and the environment given site specific exposure conditions."

That phrase, "given site specific exposure conditions," which is tacked in the human health and the environment, seems to collapse the environment back down to human health again and I don't think it's needed. There needs to be other -- we're talking about other things than just exposure here.

RESPONSE #110:

Human exposure is not the only criteria, damage to the environment is also considered.

COMMENT #111:

I don't know, and my ignorance is exposed here, but I have a little residual concern about tritium contamination and wonder if people are measuring in the right place for tritium contamination. We do know that there is infiltration going on at Los Alamos through the wastes. We do know that tritium is very mobile and infiltration has been theoretically predicted and anecdotally observed by LANL personnel, and is consistent with data that they've collected. We had a difficult time getting LANL to admit to this, but it does occur. It occurs even on the undisturbed mesa top and will occur more where pits are made with material that has a higher activity than the surrounding tuff, especially where that material settles over times and sloughs into the water.

RESPONSE #111:

All perched zone wells required to be installed under special conditions of the permit are required to monitor for tritium. Also, under this section of the permit (under Vertical Extent of Saturation), all cores are required to be analyzed for tritium ( $^3\text{H}$ ).

COMMENT #112:

Under the section, "Vertical Extent of Saturation," there's a sentence "The study should attempt to recover cores from the tuff to be used to determine laboratory values for unsaturated hydraulic conductivity conductance" and some other values.

There are also other ways to determine these values in situ rather than with cores. It's just a technical note and we worked quite a bit on this in past years.

RESPONSE #112:

In situ tests for hydraulic conductivity may be utilized when appropriate.

COMMENT #113:

One thing I noticed in the document, it sets time standards for everything the Lab has to submit and then it said "administrative authorities will approve or disapprove LANL's proposals," but it never gives any time limit. I know you all are real busy and stuff, but do you think you could possibly like agree to do it in 90 days or some perfunctory amount of time, rather than just having it open-ended, we'll get around to it whenever we get to that phase.

RESPONSE #113:

The Administrative Authority has not set time limits to which it must adhere to because: 1) each document will be SWMU specific and therefore could be either complex or simple, therefore there is no good way to predict how long it would take to review, 2) the quality of the document that the Permittee submits could increase the review time of the Administrative Authority if found extremely deficient, 3) unknown amount of resources at EPA (budget dependent) to review information. EPA realizes that delays in workplan review and approvals will be costly, and will work to avoid such delays.

COMMENT #114:

I know from some projects that I worked on up there -- for instance, a large apartment complex and I think it's called Rustic Ridge, something Ridge, right there near where the bridge is just east of the major bridge across the canyon -- when they were doing the earthwork there, they uncovered lots of buried pipe and discolored dirt and that was all spread around in doing the earthwork. A lot of the pipe and other trash that was dug up was hauled off somewhere.

It occurs to me that since people are living on those areas and maybe living on more of them soon, that sites like that ought to be checked on as soon as possible and studies done to see how many of those types of sites may be up on top of the mesa areas where improvements are being built.

RESPONSE #114:

The area referred to is SWMU #1-003, which is one of the 603 SWMUs in Table A to be investigated under the permit. This SWMU has also been placed under table B, the priority SWMUs to be investigated under a more stringent timeframe.

COMMENT #115:

Another point that occurs to me is testing for contamination. It may come down through the water systems and out of the canyons into Lake Cochiti and I would think testing ought to be done as soon as possible there, tests for hazardous chemical waste and radioactive waste. The water, studies of the fish, and core samples of the mud in the bottom of the lake should be done. There's people out there every day catching fish and eating them out of Lake Cochiti, which is something I would not want to do.

If contamination is there, which it seems quite possible and maybe at levels that people should be notified of that as soon as possible that those may not be edible fish.

RESPONSE #115:

The Rio Grande and Lake Cochiti are sampled annually, and reported in the surveillance monitoring report.

COMMENT #116:

The Module 8 refers to contamination within the facility boundary, but LANL contamination should be included whether on DOE land, public or private land and cleanup studies should be extended from the LANL boundaries.

RESPONSE #116:

Section D of Module VIII of the permit requires the Permittee to take corrective action for all releases that have migrated past the facility boundary (Section 3004(v) of RCRA).

COMMENT #117:

I think the CMS or Corrective Measures Study on the final report should be available to the public and made public and the public should be kept up to date on the cleanup procedures. Since EPA is shorthanded, maybe volunteer groups could help.

RESPONSE #117:

These reports will be held at the library at Los Alamos and copies can be requested from EPA or DOE. See also Response #11.

COMMENT #118:

I'm thrilled about the cleaning up of LANL, but cleaning up will be a very dangerous process and I hope that workers will be protected at all costs and the public and environment should be protected at all costs.

RESPONSE #118:

In section P of the permit (Task II,C.), the Permittee is required to submit a Health and Safety Plan under the RFI Workplan to ensure worker safety and health.

COMMENT #119:

Two billion dollars for cleanup really doesn't seem like much when you consider how much money we've spent making this mess. Perhaps more federal money should be made available to help the EPA monitor the cleanup process.

RESPONSE #119:

The amount of money the Agency receives is dependent upon Congress. The resources Region 6 can allot to monitoring the LANL cleanup, as well as other facility cleanups, is tied to Congressional appropriations.

COMMENT #120:

I would like to see public interest groups funded by the administration, and I don't know whether the EPA is able to put forth this idea, but I hope that you will try to get some funds for these public interest groups so that they can pursue a larger course.

RESPONSE #120:

At the present time RCRA authority does not have a provision which requires funding from EPA to a public interest group concerned about a specific facility. This funding will be only possible if Congress amends RCRA to provide funding for public interest groups.

COMMENT #121:

With regard to Module VIII, I have a couple of questions that I'd like you to address in the review of the permit. One thing is, and I don't know if I'll be repeating things but I'd like to bring these points out, how is Richardson's amendment to the Department of Defense's appropriation bill on the moratorium on the incinerator going to affect this part of the permit and is it going to be possible to divide the permit?

RESPONSE #121:

It will have no effect on Module VIII part of the permit.

COMMENT #122:

I also want to know if wastes that have been discharged into the various canyons are included in this permit and how many people in the New Mexico EID and the EPA have job applications before LANL at this point in time, because there is a lot of exchange or open-door policies that take place with people working on this Module VIII.

RESPONSE #122:

Under permit condition VIII.H.3., last paragraph, the Permittee is required to study the 15 major drainage areas or canyon systems at the facility for contaminants/wastes. The EPA permit writers for this permit do not currently have job applications at LANL.

COMMENT #123:

I've been told by a reliable source -- a person who works there and has the information -- that barium is one of the substances there and I would like to have this monitored on a much more accurate level than it is right now.

RESPONSE #123:

Barium is one of the hazardous constituents that will be required to be monitored in the permit at the analytical laboratory (EPA standard) detection limit. It is already required under Module VIII of the permit (Perched zone monitoring and Vertical Extent of Saturation).

COMMENT #124:

With the EPA, I would like you folks to please not let them do anything in moving any of that waste up there other than containing it on site. If you believe them, then you're fools, sirs. They lied to you and your own agency is investigating them at Rocky Flats. Do you think they're not going to lie to you in Los Alamos? I don't think that. I think they're going to lie to all of us to save their jobs.

RESPONSE #124:

Each SWMU (waste unit) which requires corrective measures work will receive a public participation process in which the public concerns/thoughts are taken into account.

COMMENT #125:

In RCRA, this time Section 6003, it appears that all Federal agencies shall assist the administrator in carrying out his functions under the Act and I'm wondering if that might be considered as putting an additional rationale for providing resources to the public for participation in the permit implementation process?

RESPONSE #125:

It is Region 6 interpretation that Section 6003 of RCRA is intended for those Federal agencies (such as DOE, DOD and others) which have or had waste management activities to provide such information to EPA promptly.

COMMENT #126:

I guess the one other question that I have in my notes is that this Section 7004 and the 6003 cites appear to me to indicate that there's a high degree of flexibility in the opportunities for public participation in the RCRA program and at the permit-writing level.

RESPONSE #126:

As far as 6003, refer to comment #126. Section 7004 gives the opportunities for the following public participation activities:

1. Any person can petition (such as appeal, ammend, or promulgate a regulation) the Administrator to initiate the rulemaking process on any regulation under RCRA;
2. Requires the State/EPA to develop guidance and information on Public participation assistance relating to RCRA activities; and
3. Specifies public notification, comments, and hearing requirements for RCRA issued permits.

COMMENT #127:

On page 50 and page 51 it says specifically that EPA has the authority to make value judgments about the appropriateness of an incinerator for burning mixed waste. Page 50, Screening of Corrective Measure Technologies, Part D, it says that technologies should be eliminated if they prove not feasible to implement or that they rely on technologies unlikely to perform satisfactorily or reliably.

RESPONSE #127:

Page 50 and 51 of the draft permit specifically address technologies used for corrective measures at a SWMU, only, not a regulated RCRA unit such as the case with the incinerator. The State has authority over all RCRA units (incinerator, container storage unit, and tank storage).

For example, if a SWMU has contaminated waste/constituents and it was decided that further corrective measures were needed and that the best technology/corrective measure that LANL proposed for this SWMU was to incinerate the contaminated soil, then Administrative Authority would review this proposal to determine if it was appropriate or not. Remember, all SWMU's requiring further corrective measures will require full public participation (the public must be considered and responded to).

COMMENT #128:

I can understand when the radioactive waste is on DOE facilities it is their problem, but if it floats to some other part of the country it's sort of out of their regulatory jurisdiction and you ought to have the definition of the complete extent of contamination. You've got to consider this aspect of it and whether you can actually regulate it or not.

RESPONSE #128:

Module VIII.D. of the permit requires LANL to clean-up a release that has migrated beyond the facility. The definition of the complete extent of contamination from all SWMUs is required by this module.

COMMENT #129:

I think from what I understand is that the winds go in all directions, and they go up in one way and down in another way. It seems to me that it should be tested in a wide area; not just next to the site, but a wide area.

RESPONSE #129:

As stated earlier responses, under Module VIII.B., Monitoring of Surface Ground Water, LANL, is required to submit to the Administrative Authority a report identifying all their on-and off site monitoring data for all media. This is in addition to all other permit conditions requiring thorough investigation of the LANL site.

COMMENT #130:

Can you then ask Los Alamos to demonstrate the need to use those processes to produce those hazardous wastes by virtue of showing the lack of any alternative processes, available technology, available alternative process that would be more natural, ecologically sound, et cetera?

RESPONSE #130:

The permit has been changed to read as follows:

"The Permittee shall demonstrate the need to use those processes which produce a particular hazardous waste due to a lack of alternative processes, available technology, or available alternative processes that would produce less volume/toxic waste."

MODULE VIII  
SPECIAL CONDITIONS PURSUANT TO THE 1984 HAZARDOUS AND SOLID  
WASTE AMENDMENTS TO RCRA FOR LOS ALAMOS NATIONAL LABORATORY

A. DEFINITIONS

For purposes of this Corrective Action Schedule of Compliance the following definitions shall apply:

**"Facility"** means all contiguous property under the control of the owner or operator seeking a permit under Subtitle C of RCRA.

**"Release"** means any spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, dumping, or disposing of hazardous wastes (including hazardous constituents) into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles containing hazardous wastes or hazardous constituents).

**"Solid waste management unit"** means any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at or around a facility at which solid wastes have been routinely and systematically released.

**"Hazardous waste"** means a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed. The term hazardous waste includes hazardous constituent as defined below.

**"Hazardous constituent"** means any constituent identified in Appendix VIII of 40 CFR Part 261, or any constituent identified in Appendix IX of 40 CFR Part 264.

**"Administrative Authority"** means the Director of the New Mexico Environmental Improvement Division, or his/her designee or, in case of HSWA provisions (Module VIII) for which the State is not authorized, the U.S. Environmental Protection Agency shall be the Administrative Authority.

If subsequent to the issuance of this permit, regulations are promulgated which redefine any of the above terms, the Administrative Authority may, at its discretion, apply the new definition to this permit.

B. SPECIFIC CONDITIONS

1. Waste Minimization

The Permittee shall submit to the Administrative Authority a certified plan annually by December 1, for the previous year ending September 30th, that:

- (a) the Permittee has a program in place to reduce the volume and toxicity of all hazardous wastes which are generated by the Permittee's facility operation to the degree determined to be economically practicable; and the proposed method of treatment, storage, or disposal is that practicable method currently available to the Permittee which minimizes the present and future threat to human health and the environment. This certified plan must address the items below:
- (1) Any written policy or statement that outlines goals, objectives, and/or methods for source reduction and recycling of hazardous waste at the facility.
  - (2) Any employee training or incentive programs designed to identify and implement source reduction and recycling opportunities for all hazardous/mixed wastes;
  - (3) Any source reduction and/or recycling measures implemented in the last five years or planned for the near future;
  - (4) An itemized list of the dollar amounts of capital expenditures (plant and equipment) and operating costs devoted to source reduction and recycling of hazardous waste;
  - (5) Factors that have prevented implementation of source reduction and/or recycling;
  - (6) Sources of information on source reduction and/or recycling received at the facility (e.g. local government, trade associations, suppliers, etc.);
  - (7) An investigation of additional waste minimization efforts which could be implemented at the facility. This investigation shall analyze the potential for reducing the quantity and toxicity of each waste stream through production process change, production reformulation, recycling, and all other appropriate means. The analysis shall include an assessment of the technical feasibility, cost, and potential waste reduction for each option;

- (8) The Plan shall include a flow chart or matrix detailing all hazardous wastes it produces, by quantity and type, including mixed waste, and by building/area and program if consistent with security considerations;
- (9) The Permittee shall demonstrate the need to use those processes which produce a particular hazardous waste due to a lack of alternative processes, available technology, or available alternative processes that would produce less volume of toxic waste; and
- (10) The Permittee shall demonstrate the applicability/-inapplicability of the following waste minimization techniques:
  - (a) A program that inventories the amount of contaminated lead that exists at the facility;
  - (b) A program that substitutes steel for lead (whenever possible);
  - (c) If it is impossible to substitute steel for lead, the lead is coated with a strippable coating to prevent its' entire contamination;
  - (d) A program or bench scale method to decontaminate the contaminated lead;
  - (e) Use of non-hazardous liquid scintillation cocktail solution; and
  - (f) A program designed to prevent comingling of radioactive waste.

The Permittee shall include the certified plan in the operating record.

## 2. Dust Suppression

Pursuant to 40 CFR 266.23(b), the Permittee shall not use waste or used oil or any other material, which is contaminated with dioxin, PCB, or any other hazardous waste (other than a waste identified solely on the basis of ignitability), for dust suppression or road treatment.

## 3. Compliance with Permit

Compliance with this permit during its term constitutes compliance, for the purposes of enforcement, with 40 CFR Parts 264 and 266 only for those management

practices specifically authorized by this permit. The Permittee is also required to comply with Parts 260, 261, 262, and 263 to the extent the requirements of those Parts are applicable.

4. Specific Waste Ban

- (a) The Permittee shall not place in any land disposal unit the wastes specified in RCRA Section 3004 after the effective date of the prohibition unless the Administrator has established disposal or treatment standards for the hazardous waste and the Permittee meets such standards and other applicable conditions of this permit;
- (b) The Permittee may store wastes restricted under 40 CFR 268 solely for the purpose of accumulating quantities necessary to facilitate proper recovery, treatment, or disposal provided that it meets the requirements of 40 CFR 268.50 (a) (2) including but not limited to clearly marking each tank or container;
- (c) The Permittee is required to comply with the all the requirements of 40 CFR 268.7 as amended. Changes to the waste analysis plan will be processed as minor modifications, pursuant to 40 CFR 270.42;
- (d) The Permittee shall perform a waste analysis at least annually or on each batch as necessary to determine whether the waste meets applicable treatment standards. Results shall be maintained in the operating record; and
- (e) Compliance with a RCRA permit during its term constitutes compliance, for the purpose of enforcement, with Subtitle C of RCRA except for those requirements not included in the permit which become effective by statute, or which are promulgated under Part 268 restricting the placement of hazardous wastes in or on the land.

5. Closure

Pursuant to Section 3005 (j)(1) of the Hazardous and Solid Waste Amendments of 1984, the Permittee shall close surface impoundment(s) in existence on November 8, 1984 and qualifying for interim status (see Federal Register 24717-24720, 6/30/88) in accordance with the following provisions:

- (a) The Permittee shall not place hazardous waste in the surface impoundment(s); and
- (b) The Permittee shall close the surface impoundment(s) in accordance with the closure plan(s) approved by the New Mexico Environmental Improvement Division.

6. Operation of Land Disposal

The Permittee shall not place hazardous waste in any surface impoundment or landfill unless such unit has a permit meeting the Minimum Technological Requirements outlined in Section 3004(o) of the Resource Conservation and Recovery Act. The Administrative Authority must approve the plans and specifications for retrofitting prior to commencement of construction.

7. Additional Waste Ban Requirements

The Permittee shall not land dispose any hazardous waste restricted by 40 CFR 268 unless:

- (a) The waste meets treatment standards specified in 40 CFR 268.40, .41, .42, or .43;
- (b) A variance from the treatment standards has been granted pursuant to 40 CFR 268.44;
- (c) A petition has been granted on a case-by-case extension to the effective date, pursuant to 40 CFR 268.5;
- (d) A "no-migration" petition has been granted pursuant to 40 CFR 268.6; or
- (e) The surface impoundment is exempt under 40 CFR 268.4.

C. SPECIAL PERMIT CONDITIONS

Within the designated timeframes the Permittee shall undertake the following measures concurrent with the RCRA Facility Investigation required in Module VIII D. Each submittal shall be clearly referenced as to the requirement which is being fulfilled.

1. Perched Zone Monitoring

In order to determine the extent of downgradient saturation and contamination, the Permittee shall install, at a minimum, the following wells and borings in the perched saturated alluvium in the specified canyons, within 90 days of the effective date of this permit;

- a) PUEBLO CANYON  
1 exploratory boring near TW-1A
- b) LOS ALAMOS CANYON  
1 monitoring well near LAO-3  
1 monitoring well near LAO-4.5  
1 monitoring well near LAO-5

- c) SANDIA CANYON
  - 1 monitoring well near PM-1
  - 1 monitoring well near PM-3
  
- d) MORTENDAD CANYON
  - 1 monitoring well near MCO-4
  - 1 monitoring well near MCO-6
  - 1 monitoring well near MCO-7.5
  
- e) POTRILLO CANYON
  - 1 monitoring well near State Road 4
  
- f) FENCE CANYON
  - 1 monitoring well near State Road 4
  
- g) WATER CANYON
  - 1 monitoring well near State Road 4
  - 1 monitoring well approximately 1 mile west of State Road 4
  - 1 monitoring well approximately 2 miles west of State Road 4

Within 30 days of installation of wells, the Permittee shall have gathered groundwater elevation data, and developed and submitted a map to the Administrative Authority which delineates the known extent of perched groundwater at the facility. Within 90 days of installation of wells, the Permittee shall sample each well for Appendix IX constituents, Gross Gamma, Gross Alpha, Total U, <sup>3</sup>H, <sup>137</sup>Cs, <sup>238</sup>Pu, <sup>240</sup>Pu. Analytical results from those samples shall be sent to the Administrative Authority within 120 days of well installation.

If wells are not installed in the above referenced saturated zones, the Permittee shall provide sufficient evidence to the Administrative Authority that the referenced zones do not exist at that particular location. Upon approval by the Administrative Authority the particular well(s) will be struck from further requirements.

The monitoring wells installed under this and following sections of this permit shall be constructed using flush-joint, internal upset, threaded (or an equivalent method of joining without rivets, screws and glues) casing manufactured from inert materials. The boreholes for casings and screens shall be a minimum of six (6) inches greater in diameter than the well casing or screen outer diameter. Filter pack and screen slot openings shall be sized based on formation grain size and characteristics. Well screen lengths shall be no more than (10) ten feet in length. The filter pack shall extend no more than (2) two feet above the top of the screen and shall not cross any clay layers which may act as aquitards. If a bentonite seal is used, the bentonite shall be allowed to hydrate a minimum of (12) twelve hours before emplacement of grout. Grout shall be emplaced using a tremie pipe to ensure a consistent seal at depths greater than 5 feet, and grout shall be allowed to set a minimum of twelve hours before initiating development.

Development procedures shall include purging of the well until contaminants introduced during drilling can be assured of being removed. Development shall also include surging with a surge plug, and either bailing or pumping until the nephelometric turbidity units (N.T.U.) can be consistently measured at five (5) or less, if possible. Well head construction shall include a well pad keyed into the well annulus and a system to secure the well from traffic and unauthorized access. Within thirty (30) days of construction and development of the last well required under this section, the Permittee shall submit to the Administrative Authority a report and map including:

- 1) Survey of location of each well;
- 2) Surveyed ground level, top of casing and top of well pad referenced to known elevation datum (NGVD,1929);
- 3) Static water level, referenced to mean sea level;
- 4) Well construction data (including a diagram for each well (detailing total depth, screen placement, gravel pack, annular seal, borehole and casing size (all measured to within .1 foot), and well log; and
- 5) Well development data.

After the information from these wells is reviewed, the Administrative Authority may require the installation of more wells to more fully define the extent of contamination.

## 2. Monitoring of Surface and Ground Water

Extensive monitoring of surface and ground water is now conducted and documented annually by the Permittee's Environmental Surveillance Program in accordance with DOE Orders. This program shall be continued in order to demonstrate protection of the main aquifer, and the annual reports shall be submitted to EPA. Any pertinent ongoing investigations by the U.S.G.S. that are applicable to this module shall be summarized in the LANL Environmental Surveillance Report. Within 120 days of the effective date of this permit, the Permittee shall submit to the Administrative Authority a summary describing the ongoing monitoring program, including sampling points, media, and constituents analyzed for. If EPA determines that this ongoing monitoring program is not sufficient, then EPA may impose additional monitoring requirement as a modification to this permit.

## 3. Sediment Traps Mortandad Canyon

The Permittee shall, through the maintenance of existing sediment traps or construction of new sediment traps, ensure containment of all residual sediment contamination within the facility boundary.

4. Protection of the Main Aquifer

Any boring drilled to a depth of 300 feet or deeper shall grout in a surface casing to prevent any downward migration of surface contamination along the wellbore. Any boring drilled into the main aquifer that encounters perched water shall set conductor pipe to the top of the main aquifer and hydraulically isolate the main aquifer from the perched aquifer. The annular space must be sealed with a bentonite grout or equivalent to prevent shrinkage cracking.

5. Unsaturated Zone Monitoring

The Permittee shall continue the quarterly pore gas sampling program and resume the vadose zone plume delineation program at TA-54. Due to the unique hydrogeologic conditions throughout this facility, effective monitoring of the unsaturated zone will be essential for a successful RFI/CMS. The information gathered from this program now will help provide direction for investigations to be conducted during the RFI.

6. Vertical Extent of Saturation

The Permittee shall conduct a subsurface investigation of saturation by drilling test holes through the shallow alluvial perched aquifer in Mortandad Canyon. Construction of the test holes will hydraulically isolate the perched aquifer from the underlying unsaturated tuff. This perched aquifer is recharged in part from wastewater treatment discharges located upstream. The investigation shall provide an initial evaluation of the maximum extent of the vertical and horizontal water and contaminant movement into the unsaturated tuff beneath the saturated alluvium. The study shall attempt to recover cores from the tuff to be used to determine laboratory values for unsaturated hydraulic conductivity, conductance, specific retention and specific yield, effective porosity and saturated permeability. The boring shall be analyzed for applicability of installation of neutron moisture probe access tubes to determine moisture over time. Chemical and radiochemical analyses of the cores shall also be made to assist in the determination of fluid movement from the perched alluvial aquifer into the underlying unsaturated tuff. The chemical analysis shall include Appendix IX constituents, while the radiochemical analysis shall include  $^3\text{H}$ ,  $^{137}\text{Cs}$ , Total U,  $^{238}\text{Pu}$ ,  $^{239}\text{Pu}$ ,  $^{240}\text{Pu}$ ,  $^{241}\text{Am}$ , Gross Gamma, and Gross Alpha, as appropriate. A report detailing the the results of this study shall be submitted within one year of the effective date of this permit.

7. QA/QC Evaluation

Within 90 days of issuance of this permit, the Permittee shall develop and submit to the Administrative Authority a complete detailed QA/QC description of current RCRA/HSWA field sampling and laboratory analysis procedures.

8. Identification and Summary of Previous Studies

Within 120 days of the effective date of this permit, the Permittee shall develop and submit to the Administrative Authority, a reference of all known geologic, hydrogeologic and all environmental studies relevant to potential contamination or migration of contamination from SWMUs, previously performed at and/or by the facility, with a summary of the scope of the study, and significant findings thereof.

D. CORRECTIVE ACTION FOR CONTINUING RELEASES

Section 3004 (V) of RCRA (Section 207 of the Hazardous and Solid Waste Amendments of 1984) and federal regulations promulgated as 40 CFR 264.101, require corrective action beyond the facility boundary, where necessary to protect human health and the environment, unless the owner or operator was unable to obtain the necessary permission to undertake such actions. The Permittee is not relieved of all responsibility to clean up a release that has migrated beyond the facility boundary where offsite access is denied.

Section 3004(u) of RCRA (Section 206 of the Hazardous and Solid Waste Amendments of 1984) and federal regulations promulgated as 40 CFR 264.101 require corrective action as necessary to protect human health and the environment for all releases of hazardous waste or hazardous constituents from any SWMU, regardless of when waste was placed in the unit, for all permits issued after November 8, 1984.

This section of the permit requires the Permittee to perform a RCRA Facility Investigation or the equivalent thereof (OTET) to address known or suspected releases from specified SWMUs to affected media (i.e., soil, groundwater, surface water and air). For these units, corrective measures will be proposed by the Permittee as warranted by the results of the RFI (OTET).

Failure to submit the required information or falsification of any submitted information is grounds for termination of this permit (40 CFR 270.43). The Permittee shall certify all information submitted as required by 40 CFR 270.11(d).

The required information shall include each item specified under RFI Tasks I-V and CMS Tasks VI-X (OTET). Since these required items are essential elements of this permit, failure to submit any of these elements or submission of inadequate or insufficient information may subject the Permittee to enforcement action under Section 3008 of RCRA which may include criminal penalties, fines, suspension or revocation of the permit.

If the Administrative Authority finds that corrective measures are warranted after the approval of the RFI report (OTET), the Administrative Authority will propose a permit modification and follow appropriate procedures including a public notice period and a public hearing, if warranted.

The Permittee shall undertake and complete each of the following actions to the satisfaction of the Administrative Authority and in accordance with the terms and procedures set forth in Condition P Scope of Work for a RCRA Facility Investigation (OTET). If the Permittee believes that certain requirements are not applicable, the specific requirements shall be identified and the rationale for inapplicability shall be provided.

All raw data, such as laboratory reports, drilling logs, bench-scale or pilot-scale data, and other supporting information gathered or generated during activities undertaken pursuant to this Corrective Action Schedule of Compliance shall be maintained at the facility during the term of this Permit, including any reissued Permits.

All plans and schedules required by the conditions of this Corrective Action Schedule of Compliance are, upon approval of the Administrative Authority, incorporated into this Schedule of Compliance by reference and become an enforceable part of this Permit. Any noncompliance with such approved plans and schedules shall be termed noncompliance with this Permit. Extensions of the due dates for submittals may be granted by the Administrative Authority in accordance with the permit modification process under 40 CFR 270.42.

The Permittee may propose as the equivalent process the applicable portions of the ongoing U.S. Department of Energy (DOE) Environmental Restoration (ER) Program which is patterned after and also complies with the CERCLA remedial process. EPA will evaluate the process for equivalency with RCRA requirements.

All work (information, reports, investigations remediations, etc) required by this Module (VIII) will be deemed as "functionally equivalent" of an Environmental Impact Statement (EIS). Therefore, the requirements of the National Environmental Policy Act will not apply to work required by Module VIII. (Note: See case Alambamians for a Clean Environment v. Thomas, No. CV87-0797-W (N.D.Ala. December 7, 1987)).

The Los Alamos National Laboratory (LANL) is implementing the ER Program as a number of tasks (approximately 50) due to the large number of potential release sites at LANL. The ER Program strategy for dealing with the large number of tasks is to prepare a single installation-wide work plan and task-specific RI/FS documents for each task. Depending on site-specific findings during the Corrective Action Plan process, a site within a task may be removed by a determination that no further action is necessary. A site may also be assigned, to a different task, for example, by implementing interim corrective measures. Either of these actions may be taken by the Permittee with the approval of the Administrative Authority. Such changes will be processed as major modifications, if appropriate, annually.

These documents and their associated activities shall be equivalent to those described in the Scope of Work for a RCRA Facility Investigation and the Scope of Work for a RCRA Corrective Measure Study.

The LANL installation RI/FS Work Plan shall contain the programmatic elements of the RFI Work Plan, installation-wide descriptions of the current conditions, tabular summaries (site type, type and volumes of waste, potential contaminants, potential remedial action, and annual site status) of the potential release sites (by task), prioritization of sites/tasks, and a work schedule. The task specific RI/FS documents/ process shall contain all the site specific elements of the RFI. The LANL installation RI/FS work plan shall contain outlines for the task-specific RI/FS documents to demonstrate equivalency to RFI and CMS documents.

The LANL Installation RI/FS Work Plan shall be updated annually, as appropriate. The work schedule shall be depicted on a time scale format, and will be five (5) years in length. The current fiscal year shall be shown on a monthly time scale, in sufficient detail to identify all CERCLA primary document submittals (task/site sampling and analysis plans, task/site Remedial Investigation reports, and task/site Feasibility Study reports), major milestones (start and finish of Task/Site RI/FS's), and Interim milestones (Draft Primary documents and Final Primary Documents; Start and Completion or Field Activities). The second year shall be shown on a quarterly scale, with the remaining three years on an annual scale in sufficient detail to identify major milestones for all primary document submittals. In addition, a listing describing each of the milestones depicted on the work schedule (each task) shall be provided.

The work schedule shall be updated, at a minimum, annually with the primary purpose to expand the new current fiscal year and follow-on year, and add an additional year at the end. In addition, any approved schedule changes shall be incorporated at this time, if not previously incorporated. This annual update shall be performed in the fourth quarter of the previous fiscal year. The draft LANL installation RI/FS workplan shall be submitted to the Administrative Authority by September 1 of each year. The work schedule may be revised at any time during the year for significant changes (e.g., major change in funding). The annual updates, or revisions due to significant changes, to the work schedule shall require new approval by the Administrative Authority.

E. REPORTING REQUIREMENTS

1. Copies of other reports (e.g., inspection reports), drilling logs and laboratory data shall be made available to the Administrative Authority upon request.
2. As specified under Permit Conditions F and G, the Administrative Authority may require the Permittee to conduct new or more extensive assessments, investigations, or studies, as needed, based on information provided in these progress reports or other supporting information.

F. NOTIFICATION REQUIREMENTS FOR AND ASSESSMENT OF NEWLY-IDENTIFIED SOLID WASTE MANAGEMENT UNIT(S)

1. The Permittee shall notify the Administrative Authority in writing of any newly-identified SWMU(s) (i.e., a unit not specifically identified during the RFA) discovered during the course of ground water monitoring, field investigations, environmental audits, or other means, no later than fifteen (15) calendar days after discovery. The Permittee shall propose the schedule for corrective actions.
2. After such notification, the Administrative Authority may request, in writing, that the Permittee prepare a Solid Waste Management Unit (SWMU) Assessment plan and a proposed schedule of implementation and completion of the Plan for any additional SWMU(s) discovered subsequent to the issuance of this Permit.

3. Within ninety (90) calendar days after receipt of the Administrative Authority's request for a SWMU Assessment Plan, the Permittee shall prepare a SWMU Assessment Plan for determining past and present operations at the unit, as well as any sampling and analysis of ground water, land surface and subsurface strata, surface water or air, as necessary to determine whether a release of hazardous waste including hazardous constituents from such unit(s) has occurred, is likely to have occurred, or is likely to occur. The SWMU Assessment Plan shall demonstrate that the sampling and analysis program, if applicable, is capable of yielding representative samples and shall include parameters sufficient to identify migration of hazardous waste including hazardous constituents from the newly-discovered SWMU(s) to the environment.
4. After the Permittee submits the SWMU Assessment Plan, the Administrative Authority will either approve or disapprove the Plan in writing.

If the Administrative Authority approves the Plan, the Permittee shall begin to implement the Plan within fifteen (15) calendar days of receiving such written notification.

If the Administrative Authority disapproves the Plan, the Administrative Authority will either (1) notify the Permittee in writing of the Plan's deficiencies and specify a due date for submittal of a revised Plan, or (2) revise the Plan and notify the Permittee of the revision. This Administrative Authority-revised Plan becomes the approved SWMU Assessment Plan. The Permittee shall implement the Plan within fifteen (15) calendar days of receiving written approval.

5. The Permittee shall submit a SWMU Assessment Report to the Administrative Authority no later than sixty (60) calendar days from completion of the work specified in the approved SWMU Assessment Plan. The SWMU Assessment Report shall describe all results obtained from the implementation of the approved SWMU Assessment Plan. At a minimum, the Report shall provide the following information for each newly-identified SWMU:
  - a. The location of the newly-identified SWMU in relation to other SWMUs;
  - b. The type and function of the unit;
  - c. The general dimensions, capacities, and structural description of the unit (supply any available drawings);
  - d. The period during which the unit was operated;
  - e. The specifics on all wastes that have been or are being managed at the SWMU, to the extent available; and

- f. The results of any sampling and analysis required for the purpose of determining whether releases of hazardous wastes including hazardous constituents have occurred, are occurring, or are likely to occur from the unit.
  6. Based on the results of this Report, the Administrative Authority shall determine the need for further investigations or corrective measures at specific unit(s) covered in the SWMU Assessment. If the Administrative Authority determines that such investigations are needed, the Administrative Authority may require the Permittee to prepare a plan for such investigations. This plan will be reviewed for approval as part of the RFI Workplan under Permit Condition VIII.H.
- G. NOTIFICATION REQUIREMENTS FOR NEWLY-DISCOVERED RELEASES AT SWMU(s)

The Permittee shall notify the Administrative Authority, verbally, of any release(s) of hazardous waste including hazardous constituents in which there is a statistically significant increase over the background data for the media of concern, during the course of ground water monitoring, field investigation, environmental auditing, or other activities undertaken after the commencement of the RFI, no later than twenty four (24) hours after discovery. This notification must also be made in writing within 15 days of discovery. Such newly-discovered releases may be from newly identified units, from units for which, based on the findings of the RFA, the Administrative Authority has previously determined that no further investigation was necessary, or from units investigated as part of the RFI. The Administrative Authority may require further investigation of the newly-identified release(s). A plan for such investigation will be reviewed for approval as part of the RFI Workplan.

H. RCRA Facility Investigation (RFI) or the Equivalent Thereof

(1) Preliminary Report (LANL Installation RI/FS Work Plan)

Within one hundred eighty (180) days of the effective date of this permit, the Permittee shall submit to the Administrative Authority a Preliminary Report describing the current conditions at the facility as outlined in the RFI scope of work, Task I (OTET). The Preliminary Report is limited to SWMUs not identified in the Part B or to recent information not addressed in the RCRA Facility Assessment or in the LANL December 1988 SWMU report. The Preliminary Report shall address the background information pertinent to the facility and the nature and extent of contamination.

The LANL Installation RI/FS Workplan (as part of the RFI Task I.A.) shall include an overview of the installation-wide Los Alamos hydrogeological environment. This overview shall be a summary description of the major features and conceptual interrelationships of the hydrogeological environment at Los Alamos. It shall address the regional and installation-wide geologic setting and hydrologic characteristics affecting the occurrence, movement, and interaction of surface and subsurface water with a view toward understanding potential pathways for transport of contaminants.

This overview shall provide a guide and referencing to appropriate maps submitted with the installation workplan and to appropriate detailed information in the significant geologic and hydrologic reports and studies listed and summarized in the task "Identification and Summary of Previous Studies" required under Section B., Special Permit Conditions. The overview shall be reviewed and updated as appropriate annually (as part of the Installation Workplan update) to incorporate the major findings with installation-wide significance from studies conducted under either the Special Permit Conditions or the Task/Site RI/FS investigations.

(2) RFI Work Plan (LANL Installation RI/FS Work Plan)

Within one hundred eighty (180) days of the effective date of this permit, the Permittee shall submit to the Administrative Authority for approval a RFI Work Plan, as outlined in the RFI scope of work, Condition P., Task II (OTET). The scope of the RFI (OTET) shall include units and releases to the affected media specified in the LANL Installation RI/FS Work Plan, which shall be updated and approved annually.

After the Permittee submits the RFI Work Plan (OTET), the Administrative Authority will approve, disapprove or modify the plan. If the Administrative Authority approves the plan, the Permittee shall immediately initiate implementation of the plan according to the schedule contained therein.

In the event of disapproval (in whole or in part) of the plan, the Administrative Authority will specify any deficiencies in writing. The Permittee shall modify the plan to correct these within 30 days of receipt of the disapproval by the Administrative Authority. If more than 30 days is required, the Permittee must provide a written request for time extension with justification for the extension. No extension is granted unless the Administrative Authority provides written notice of such extension within ten (10) days of the Administrative Authority's receipt of the Permittee's written request. The modified plan shall be submitted in writing to the Administrative Authority for review. Should the Permittee take exception to all or part of the disapproval, the Permittee shall submit to the Administrative Authority a written statement of the grounds for the exception within 15 days of receipt of the disapproval by the Administrative Authority.

If disagreements cannot be resolved, the Administrative Authority may make further modifications as required. If the Administrative Authority modifies the plan, this modified plan becomes the approved RFI Work Plan (OTET). The Permittee shall immediately initiate implementation of the approved RFI Work Plan (OTET) according to the schedule contained therein.



(3) RFI Work Plan (LANL Task/Site RI/FS Documents)

The Permittee shall submit to the Administrative Authority for approval an RFI Work Plan as outlined in the RFI scope of work Task II (OTET). The scope of the RFI Work Plan shall address the necessary action to verify and determine the nature and extent of releases of hazardous waste or hazardous constituents from solid waste management units. As appropriate and with the approval of the Administrative Authority, the RFI Work Plan shall be developed and implemented using the phased approach as described in EPA Corrective Action Plan guidance documents. Information obtained during the preceding phase shall be incorporated in the modified RFI Work Plan for the subsequent phase. The draft RFI Report shall be prepared when all phases of the RFI have been completed to the satisfaction of the Administrative Authority. The RFI shall gather all necessary data to support the Corrective Measures Study (CMS) described below. The CMS will be required if the data gathered during the RFI is, in the judgement of the Administrative Authority, sufficient to require one. The scope of the RFI shall include, but not be limited to, the following units and include releases to all media (see Tables A & B). Table A identifies all SWMU's required for an RFI under this permit. Table B is a subset of table A and contains the priority SWMU's. The SWMU's in those tables are numbered using the LANL SWMU Report, December, 1988.

- (a) The Permittee shall include in the Task/Site RFI Workplans within 1 year of the effective date of the permit, 10% of those SWMUs listed in Table A. This Workplan shall include 20% of those SWMUs listed in Table B (Table B is a subset of Table A).
- (b) The Permittee shall include in the RFI Task/Site Workplans within 2 years of the effective date of the permit, an additional 25% (cumulative total of 35%) of those SWMUs listed in Table A. This Workplan shall include an additional 35% (cumulative total of 55%) of those SWMUs listed in Table B.
- (c) The Permittee shall include in the Task/Site RFI Workplans within 3 years of the effective date of the permit, an additional 20% (cumulative total of 55%) of those SWMUs listed in Table A. This Workplan shall include the remaining 45% (cumulative total 100%) of those SWMUs listed in Table B.
- (d) The Permittee shall include in the Task/Site RFI Workplans within 4 years of the effective date of the permit, all SWMUs (cumulative total 100%) listed in Table A. SWMUs identified after the LANL SWMU Report, December, 1988 may be required to do an RFI, if deemed necessary by the Administrative Authority.
- (e) The CMS Final Report for all SWMU's shall be submitted within 10 years of the effective date of this permit.

Table A

Technical Area 0

SWMU Number

- 0-001
- 0-002
- 0-003
- 0-005
- 0-006
- 0-007
- 0-009 **(11)**
- 0-012
- 0-014
- 0-017
- 0-023 (Contractor's Row PCB Contamination)

Technical Area 1

- 1-001 (a-n)
- 1-002 **(16)**
- 1-003

Technical Area 2

- 2-005
- 2-007 **(6)**
- 2-008
- 2-009 (a-c)

Technical Area 3

- 3-001 (a-c)
- 3-001 (m)
- 3-001 (p)
- 3-001 (r)
- 3-002 (b-c)
- 3-003 (a-c)
- 3-009 (a-h)
- 3-010 **(56)**
- 3-012 (a-b)
- 3-013
- 3-014 (a-u)
- 3-015
- 3-018
- 3-020
- 3-028
- 3-029 (a-b)
- 3-033
- 3-035 (a-b)
- 3-036 (a)
- 3-036 (d-e)

Technical Area 3 Cont.

- 3-037
- 3-038 (a-b) **(5)**
- 3-039
- 3-044

Technical Area 4

- 4-001
- 4-002 **(2)**

Technical Area 5

- 5-001 (a-b)
- 5-002
- 5-003 **(6)**
- 5-004
- 5-005

Technical Area 6

- 6-001 (a-b)
- 6-002
- 6-003 (c) **(6)**
- 6-006
- 6-007

Technical Area 7

- 7-001 (a-b) **(2)**

Technical Area 8

- 8-002
- 8-003 (a-c)
- 8-004 (a-d) **(11)**
- 8-006 (a-b)
- 8-007

Technical Area 9

- 9-003 (a-f)
- 9-004 (a-o)
- 9-005 (a-h) **(33)**
- 9-006
- 9-007
- 9-008
- 9-009

Technical Area 10

10-001 (a-d)  
10-002 (a-b)  
10-003 (a-f) (15)  
10-004 (a-b)  
10-006

Technical Area 11

11-001 (a-c)  
11-002  
11-004 (a-e)  
11-005 (a-b) (14)  
11-006  
11-007  
11-009

Technical Area 12

12-001 (a)  
12-001 (b) (2)

Technical Area 13

13-002  
13-004 (2)

Technical Area 14

14-002 (a-f)  
14-004 (b) (9)  
14-005  
14-007

Technical Area 15

15-002  
15-003  
15-004 (e)  
15-006 (a-d)  
15-007 (a-d)  
15-008 (a-d) (30)  
15-009 (a-b)  
15-010 (a-c)  
15-011 (a-c)  
15-012 (a-g)

Technical Area 16

16-001 (b-e)  
16-003 (a-v)  
16-004 (a-f) (41)  
16-006 (a-h) (a-b, d-h)  
16-007  
16-008 (a)

Technical Area 16 Cont.

16-009 (a-b)  
16-010 (a-m)  
16-012 (a-y)  
16-013 (a-b)  
  
16-016 (47)  
16-018  
16-019  
16-020  
16-021

Technical Area 18

18-001  
18-002 (a-b)  
18-003 (a-h) (14)  
18-004 (b)  
18-005  
18-007

Technical Area 19

19-001 (1)

Technical Area 20

20-001 (a-c)  
20-002 (5)  
20-003 (a)

Technical Area 21

21-002  
21-003  
21-005  
21-006 (a-e) (27)  
21-007  
21-010 (a-h)  
21-011 (a-i)  
21-012  
  
21-013 (a-c)  
21-014  
21-015  
21-016 (a-g)  
21-017 (a-c) (41)  
21-018 (a-b)  
21-021  
21-022 (a-h)  
21-023 (a-d)  
21-024 (a-k)

Technical Area 22

22-005  
22-006  
22-007  
22-008  
22-009 (9)  
22-010 (a-c)  
22-011

Technical Area 27

27-001 (7)  
27-002 (a-e)  
27-003

Technical Area 31

31-001 (1)

Technical Area 32

32-002 (a-b) (2)

Technical Area 33

33-001 (a-e)  
33-002 (a-c)  
33-003 (a-b)  
33-004 (a-f)  
33-007  
33-008 (a-b)  
33-009 (28)  
33-010 (a-c)  
33-011  
33-012 (a)  
33-013  
33-014  
33-017

Technical Area 35

35-002  
35-003 (a-q)  
35-004 (e)  
  
35-006  
35-008 (35)  
35-009 (a-h)  
35-010 (a-d)  
35-014  
35-015 (b)

Technical Area 36

36-001  
36-002  
  
36-003 (a-c) (6)  
36-005

Technical Area 39

39-001 (a-e)  
39-002 (a)  
39-002 (c)  
39-003 (13)  
39-004 (c-e)  
39-006 (a-b)

Technical Area 40

40-001 (a-c)  
40-003 (a)  
40-004 (10)  
40-005  
40-006 (a-c)  
40-009

Technical Area 41

41-001  
41-002 (a-c) (4)

Technical Area 43

43-001 (1)

Technical Area 45

45-001  
45-002 (3)  
45-003

Technical Area 46

46-002  
46-003 (a-g)  
46-004 (a-h)  
46-005 (28)  
46-006 (a-d)  
46-007  
46-008 (a-f)

Technical Area 48

48-002 (a-b)  
48-003 (a-b) (5)  
48-005

Technical Area 49

49-001  
49-003 (2)

Technical Area 50

50-001  
50-002 (a-d)  
50-004  
50-006 (11)  
50-009  
50-011 (a-c)

Technical Area 52

52-001 (a-d)  
52-002 (a-k) (15)

Technical Area 53

53-001 (a)  
53-001 (b)  
53-002 (a-b)  
53-005 (11)  
53-006 (b-e)  
53-007 (a-b)

Technical Area 54

54-001 (a)  
54-001 (c)  
54-003 (b) (9)  
54-004 )excluding Shaft No. 9)  
54-005  
54-006 — *019*  
54-007 (A-C)  
54-013

Technical Area 59

59-001 (1)

603 Total SWMU's

(54)

Table B - Priority SWMUs\*

<u>SWMU No.</u>	<u>SWMU No.</u>
005	16-018
007	16-019
009	16-020
1-001 (a-n)	16-021
1-003	18-001
1-002	18-003 (a-h)
2-005	21-006 (a-e)
2-008	21-010 (a-h)
3-010	21-011 (a-i)
3-012 (a-b)	21-012
3-013	21-014
3-015	21-015
3-029 (a-b)	21-016 (a-g)
5-005	21-017 (a-c)
6-007	21-018 (a-b)
8-003 (a-c)	22-008
8-007	35-010 (a-d)
9-008	39-001 (a-e)
9-009	46-002
10-003 (a-f)	46-006 (a-d)
10-006	46-007
11-004 (a-e)	49-001
11-005 (a-b)	50-006
11-006	50-009
13-004	54-003 (b)
15-002	54-004 (except for Shaft No.9)
15-006 (a-d)	54-005
15-007 (a-d)	
15-008	33-002 (a-c)
15-009	33-017
15-012 (a-g)	
16-001 (b-e)	35-006
16-006 (a-b, d-h)	36-003 (a-c)
16-007	41-001
16-008 (b)	35-003 (a-q)
16-016	3-020

**182 SWMU's**

\* As RFI work progresses, EPA may identify more SWMUs to be added to the list to be addressed in the installation workplans.

After the Permittee submits the RFI Work Plan (OTET), the Administrative Authority will approve, disapprove, or modify the plan. If the Administrative Authority approves the plan, the Permittee shall immediately initiate implementation of the plan according to the schedule contained therein. Approved workplans are incorporated into this permit.

In the event of disapproval (in whole or in part) of the plan, the Administrative Authority will specify any deficiencies in writing. The Permittee shall modify the plan to correct these within 30 days of receipt of the disapproval by the Administrative Authority. If more than 30 days is required, the Permittee shall provide a written request for time extension, with justification for the extension. The modified plan shall be submitted in writing to the Administrative Authority for review. Should the Permittee take exception to all or part of the disapproval, the Permittee shall submit to the Administrative Authority a written statement of the grounds for the exception within 15 days of receipt of the disapproval by the Administrative Authority.

If disagreements cannot be resolved, the Administrative Authority shall make further modifications as required. If the Administrative Authority modifies the plan, this modified plan becomes the approved RFI Work Plan (OTET). The Permittee shall immediately initiate implementation of the approved RFI Work Plan (OTET) according to the schedule contained therein.

The Permittee shall prepare the RFI Work Plan (OTET) and undertake the facility investigation in accordance with the following:

- (i) Development of the RFI Work Plan (OTET) and reporting of data shall be consistent with the RCRA Facility Investigation Guidance Document (EPA OSWER Directive 9502.00-6c) or the equivalent thereof;
- (ii) EPA and the NMEID reserve the right to split samples with the Permittee. The Permittee shall notify EPA and the NMEID at least 10 days prior to any sampling activity which has been identified from the field sampling plan by EPA or NMEID for split sampling;
- (iii) When developing groundwater related investigations, the permittee shall be consistent with the RCRA Groundwater Monitoring Technical Enforcement Guidance Document (EPA OSWER Directive 9950-1, September 1986) or the equivalent thereof to determine methods and materials that are acceptable to EPA; and
- (iv) Any schedule deviations from the approved RFI Work Plan (OTET) which are necessary during implementation of the facility investigation shall be fully documented and described in the monthly reports and in the draft RFI report. Technical deviations from the approved RFI Workplan (OTET) shall be fully documented and described in the draft RFI report (OTET).

The Permittee shall submit a draft RFI report and Summary Report (OTET) to the Administrative Authority in accordance with the schedule in the RFI Work Plan (OTET). The draft report shall include all the results from the facility investigation described in Condition P., Task III (OTET). The Summary Report shall describe more briefly the procedures, methods, and results from the facility investigation described in Scope of Work, Task III. An extension of the time required to submit the draft RFI report (OTET) may be obtained only through the Permittee's written request and the written approval of the Administrative Authority.

After the Permittee submits the RFI report (OTET), the Administrative Authority will either approve or disapprove the adequacy of the report. If the Administrative Authority disapproves the report, the Administrative Authority shall specify the deficiencies and the Permittee shall have thirty (30) days to submit a modified report. If this report is not approved, the Administrative Authority may make further modifications as required. If the Administrative Authority modifies the report, this modified report becomes the approved RFI report (OTET).

The Permittee shall submit one or more Task/Site Workplans for studies to evaluate the 15 major drainage areas or Canyon systems at the facility. These studies must address each system as an integrated unit and evaluate them for potential impacts of contaminants from SWMUs. The plans must address the existence of contamination and the potential for movement or transport to or within Canyon watersheds, and interactions with the alluvial aquifers and the main aquifer. The studies shall evaluate the potential for offsite exposure through these pathways including the ground water and possible impacts on the Rio Grande.

## I. INTERIM MEASURES

1. If during the course of any activity initiated under this Corrective Action Schedule of Compliance, the Administrative Authority determines that a release or potential release of hazardous constituents from a SWMU poses a threat to human health and the environment, the Administrative Authority may specify interim measures. The Administrative Authority may determine the specific measure, including potential permit modifications and the schedule for implementing the required measures. The Administrative Authority may require submission of an interim measures workplan for approval. The Administrative Authority shall notify the Permittee in writing of the requirement to perform such interim measures. The Administrative Authority shall modify the Corrective Action Schedule of Compliance either according to procedures in this Module, or according to the permit modification procedures under 40 CFR 270.41, to incorporate such interim measures into the Permit. If, for institutional reasons not related to permit work, i.e. routine construction, an interim measure is required, the permittee will submit appropriate documentation to the Administrative Authority for approval.
2. The following factors may be considered by the Administrative Authority in determining the need for interim measures:
  - a. Time required to develop and implement a final remedy;
  - b. Actual and potential exposure to human and environmental receptors;
  - c. Actual and potential contamination of drinking water supplies and sensitive ecosystems;
  - d. The potential for further degradation of the medium absent interim measures;
  - e. Presence of hazardous waste in containers that may pose a threat of release;
  - f. Presence and concentration of hazardous waste including hazardous constituents in soil that have the potential to migrate to ground water or surface water;
  - g. Weather conditions that may affect the current levels of contamination;
  - h. Risks of fire, explosion, or accident; and
  - i. Other situations that may pose threats to human health and the environment.

J. DETERMINATION OF NO FURTHER ACTION

1. Based on the results of the RFI and other relevant information, the Permittee may submit an application to the Administrative Authority for a Class III permit modification under 40 CFR 270.42(c) to terminate the RFI/CMS process for a specific unit. This permit modification application must contain information demonstrating that there are no releases of hazardous wastes including hazardous constituents from SWMUs at the facility that pose a threat to human health and the environment, as well as information required in 40 CFR 270.42.(c), which incorporates by reference 40 CFR 270.13 through 270.21, 270.62, and 260.63.

If, based upon review of the Permittee's request for a permit modification, the results of the RFI, and other information, including comments received during the sixty (60) day public comment period required for Class III permit modifications, the Administrative Authority determines that releases or suspected releases which were investigated either are non-existent or do not pose a threat to human health and the environment, the Administrative Authority will grant the requested modification.

2. A determination of no further action shall not preclude the Administrative Authority from requiring continued or periodic monitoring of air, soil, ground water, or surface water, when site-specific circumstances indicate that release of hazardous wastes including hazardous constituents are likely to occur, if necessary to protect human health and the environment.
3. A determination of no further action shall not preclude the Administrative Authority from requiring further investigations, studies, or remediation at a later date, if new information or subsequent analysis indicates a release or likelihood of a release from a SWMU at the facility that is likely to pose a threat to human health or the environment. In such a case, the Administrative Authority shall initiate either a modification to the Corrective Action Schedule of compliance according to procedures in this Module, or a major permit modification according to 40 CFR 270.41, to rescind the determination of no further action.

K. CORRECTIVE ACTION MEASURES STUDY PLAN

1. If the Administrative Authority has reason to believe that a SWMU has released concentrations of hazardous constituents, or if the Administrative Authority determines that contaminants present a threat to human health and the environment given site-specific exposure conditions, or may present a threat over the lifetime of wastes, the Administrative Authority may require a Corrective Measures Study (CMS) and shall notify the Permittee in writing. The notification may also specify remedial alternatives and pilot or bench scale studies to be evaluated by the Permittee during the CMS.

2. The Permittee shall submit a draft CMS Plan to the Administrative Authority within ninety (90) calendar days from notification of the requirement to conduct a CMS. The Scope of Work for a Corrective Measure Study (CMS) is in Section Q.

The CMS Plan shall provide the following information:

- a. A description of the general approach to investigation and potential remedies;
  - b. A definition of the overall objectives of the study;
  - c. The specific plans for evaluating remedies to ensure compliance with remedy standards;
  - d. The schedules for conducting the study;
  - e. The proposed format for the presentation of information; and
  - f. Any pilot or bench scale studies necessary.
3. After the Permittee submits the draft CMS plan, the Administrative Authority will either approve or disapprove the plan. If the plan is not approved, the Administrative Authority will notify the Permittee in writing of the plan's deficiencies and specify a due date for submittal of the revised plan. If this plan is not approved, the Administrative Authority will revise the Plan and notify the Permittee of the revisions. This Administrative Authority-revised Plan becomes the approved Plan.

L. CORRECTIVE MEASURES STUDY IMPLEMENTATION

No later than fifteen (15) calendar days after the Permittee has received written approval from the Regional Administrator for the CMS Plan, the Permittee shall begin to implement the Corrective Measures Study according to the schedules specified in the CMS Plan. The CMS shall be conducted in accordance with the approved Plan.

M. CORRECTIVE MEASURES STUDY FINAL REPORT

1. Within sixty (60) calendar days after the completion of the CMS, the Permittee shall submit a CMS Final Report. The CMS Final Report shall summarize the results of the investigations for each remedy studied and of any bench-scale or pilot tests conducted. The CMS Report must include an evaluation of each remedial alternative. The CMS Report shall present all information gathered under the approved CMS Plan. The final report must contain adequate information to support the Regional Administrator in the remedy selection decision making process.
2. If the Regional Administrator determines that the CMS Final Report does not fully satisfy the information requirements specified under Permit condition M.1., the Regional Administrator may disapprove

the CMS Final Report. If the Regional Administrator disapproves the Final Report, the Regional Administrator will notify the Permittee in writing of deficiencies in the Report and specify a due date for submittal of a revised Final Report [e.g., thirty (30) days after notification].

3. Based on preliminary results and the final CMS report, the Administrative Authority may require the Permittee to evaluate additional remedies or particular elements of one or more proposed remedies.

#### N. MODIFICATION OF THIS MODULE

1. If at any time the Administrative Authority determines that modification of the Corrective Action Schedule of Compliance is necessary, he or she may initiate a modification to the Schedule of Compliance according to the procedures of this Section. If the Administrative Authority initiates a modification, he or she will:
  - a. Notify the Permittee in writing of the proposed modification and the date by which comments on the proposed modification must be received;
  - b. Publish a notice of the proposed modification in a locally distributed newspaper, mail a notice to all persons on the facility mailing list maintained according to 40 CFR 124.10 (c)(1)(ix), and place a notice in the facility's information repository (i.e., a central source of all pertinent documents concerning the remedial action, usually maintained at the facility or some other public place, such as a public library, that is accessible to the public) if one is required; and
    1. If the Administrative Authority receives no written comment on the proposed modification, the modification will become effective five (5) calendar days after the close of the comment period.
    2. If the Administrative Authority receives written comment on the proposed modification, the Administrative Authority will make a final determination concerning the modification after the end of the comment period.
  - c. Notify the Permittee in writing of the final decision.
    1. If no written comment was received, the Administrative Authority will notify individuals on the facility mailing list in writing that the modification has become effective and will place a copy of the modified Corrective Action Schedule of Compliance in the information repository, if a repository is required for the facility.

2. If written comment was received, the Administrative Authority will provide notice of the final modification decision in a locally distributed newspaper and place a copy of the modified Corrective Action Schedule of Compliance in the information repository, if a repository is required for the facility.
2. Modifications that are initiated and finalized by the Administrative Authority according to this process shall not be subject to administrative appeal.
3. Modifications to the Corrective Action Schedule of Compliance do not constitute a reissuance of the Permit.

0. FACILITY SUBMISSION SUMMARY

Below is a summary of the planned reporting requirements pursuant to this Schedule to Compliance:

<u>Facility Submission Requirements</u>	<u>Due Date</u>
Written notification of newly-identified SWMUs	fifteen (15) calendar days after discovery
Written notification of newly-discovered releases	fifteen (15) calendar days after discovery
Verbal notification of newly-discovered releases	24 hours after release discovery
Monthly Management Reports	monthly no later than sixty (60) calendar days after effective date of permit
Task I Preliminary Report Description of Current Conditions Installation Workplan	one hundred eighty (180) calendar days from effective date of permit
SWMU Assessment Plan for newly-identified SWMUs	ninety (90) calendar days after receipt of request
Revised SWMU Assessment Plan	as determined
SWMU Assessment Report	sixty (60) calendar days after completion of implementation of SWMU Assessment Plan
Task II Installation RFI Workplan for SWMU(s)	one hundred eighty (180) calendar days after the effective date of the permit
Task/Site Workplans	as specified in Installation RFI Workplan
RFI Preliminary Report	according to schedule in RFI Workplan
Revised RFI Workplan	as determined by Administrative Authority usually within 30 days of receipt of NOD
RFI Report and Summary Report	sixty (60) calendar days after completion of RFI

Facility Submission Requirements Cont.

Due Date

Technological Progress Reports	quarterly no later than one hundred eighty (180) days from effective date of permit
Revised RFI Report and Summary Report	thirty (30) calendar days after notification of deficiency
Interim Measures Plan for interim measures required after permit issuance	thirty (30) calendar days after notification
Revised Interim Measure Plan	as determined
CMS Plan	ninety (90) calendar days after notification of requirement to perform CMS
Revised CMS Plan	as determined
CMS Report	sixty (60) calendar days after completion of CMS
Revised CMS Report	thirty (30) calendar days after notification of deficiency

P. SCOPE OF WORK FOR A RCRA FACILITY INVESTIGATION (RFI)  
AT  
LOS ALAMOS NATIONAL LABORATORY

PURPOSE

The purpose of this RCRA Facility Investigation is to determine the nature and extent of releases of hazardous waste or hazardous constituents from solid waste management units. The Permittee shall furnish all personnel, materials, and services necessary for, or incidental to, performing the RCRA Facility Investigation at Los Alamos National Laboratory.

If the Permittee believes that certain requirements of the scope of work are not applicable, the specific requirements shall be identified and the rationale for inapplicability shall be provided. The scope of work should be modified as necessary to require only that information necessary to complete the RCRA RFI (OTET) for each individual task. The EPA will review the scope of work to determine if specific requirements are applicable.

SCOPE

The RCRA Facility Investigation (RFI) consists of five (5) tasks. Those tasks, and the ER program documents that must be equivalent to the RFI documents/activities are listed on the following page. The Permittee shall prepare a single installation-wide work plan, which shall be updated annually, and task-specific RI/FS for each task. The installation-wide work plan together with the RI/FS documents for a task must complete the RFI equivalent document set for a task. The installation-wide work plan shall contain programmatic operating procedures, tabular summaries of the potential release sites, prioritization of the sites/tasks, and a work schedule by task (including a current year work plan). The task-specific RI/FS documents/activities shall be prepared as tasks are implemented. The detailed outlines for the task-specific RI/FS documents shall be provided in the installation-wide work plan.

Scope of the RFI

ER Program Equivalent

<u>The RCRA Facility Investigation consists of five tasks:</u>	<u>LANL Installation RI/FS Work Plan</u>	<u>LANL Task/Site RI/FS</u>
<p>Task I: Description of Current Conditions</p> <ul style="list-style-type: none"> <li>A. Facility Background</li> <li>B. Nature and Extent of Contamination</li> </ul>	<p>I. LANL Installation RI/FS Work Plan</p> <ul style="list-style-type: none"> <li>A. Installation Background</li> <li>B. Tabular Summary of Contamination by Site</li> </ul>	<p>I. Quality Assurance Project Plan</p> <ul style="list-style-type: none"> <li>A. Task/Site Background</li> <li>B. Nature and Extent of Contamination</li> </ul>
<p>Task II: RFI Workplan</p> <ul style="list-style-type: none"> <li>A. Data Collection Quality Assurance Plan</li> <li>B. Data Management Plan</li> <li>C. Health and Safety Plan</li> <li>D. Community Relations Plan</li> </ul>	<p>II. LANL Installation RI/FS Work Plan</p> <ul style="list-style-type: none"> <li>A. General Standard Operating Procedures for Sampling, Analysis and Quality Assurance</li> <li>B. Technical Data Management Program</li> <li>C. Health and Safety Program</li> <li>D. Community Relations Program</li> </ul>	<p>II. LANL Task/Site RI/FS Documents</p> <ul style="list-style-type: none"> <li>A. Quality Assurance Project Plan and Field Sampling Plan</li> <li>B. Technical Data Management Plan</li> <li>C. Health and Safety Plan</li> <li>D. Community Relations Plan</li> </ul>
<p>Task III: Facility Investigation</p> <ul style="list-style-type: none"> <li>A. Environmental Setting</li> <li>B. Source Characterization</li> <li>C. Contamination Characterization</li> <li>D. Potential Receptor Identification</li> </ul>	<p>III.</p>	<p>III. Task/Site Investigation</p> <ul style="list-style-type: none"> <li>A. Environmental Setting</li> <li>B. Source Characterization</li> <li>C. Contamination Characterization</li> <li>D. Potential Receptor Identification</li> </ul>
<p>Task IV: Investigative Analysis</p> <ul style="list-style-type: none"> <li>A. Data Analysis</li> <li>B. Protection Standards</li> </ul>	<p>IV.</p>	<p>IV. LANL Task/Site Investigative Analysis</p> <ul style="list-style-type: none"> <li>A. Data Analysis</li> <li>B. Protection Standards</li> </ul>
<p>Task V: Reports</p> <ul style="list-style-type: none"> <li>A. Preliminary and Workplan</li> <li>B. Progress</li> <li>C. Draft and Final</li> </ul>	<p>V. Reports</p> <ul style="list-style-type: none"> <li>A. LANL Installation RI/FS Work Plan</li> <li>B. Annual Update of LANL Installation RI/FS Work Plan</li> <li>C. Draft and Final</li> </ul>	<p>V. LANL Task/Site Reports</p> <ul style="list-style-type: none"> <li>A. Quality Assurance Project Plan, Field Sampling Plan, Technical Data Management Plan, Health and Safety Plan, Community Relations Plan</li> <li>B. LANL Task/Site RI/FS Documents and LANL Monthly Management Status Report</li> <li>C. Draft and Final</li> </ul>

TASK I: PRELIMINARY REPORT: DESCRIPTION OF CURRENT CONDITIONS

The Permittee shall submit to the Administrative Authority a Preliminary Report providing the background information pertinent to the facility, contamination and any type of on-going corrective action as set forth below. This report is limited to SWMUs not identified in the Part B permit application or to recent information not addressed in the RCRA Facility Assessment, or in the LANL December 1988 SWMU report.

A. Facility Background

The Permittee report shall summarize the regional location, pertinent boundary features, general facility physiography, hydrogeology, and historical use of the facility for the treatment, storage or disposal of solid and hazardous waste. The Permittee's report shall include:

1. Map(s) depicting the following:
  - a. General geographic location;
  - b. Property lines, with the owners of all adjacent property clearly indicated;
  - c. Topography using available scales, waterways, all wetlands greater than 1 acre, floodplains, water features, and drainage patterns;
  - d. All solid waste management units;
  - e. All known past solid or hazardous waste treatment, storage or disposal areas regardless of whether they were active on November 19, 1980;
  - f. Surrounding land uses (residential, commercial, agricultural, recreational); and
  - g. The location of all production and groundwater monitoring wells. These wells shall be clearly labeled and ground and top of casing elevations included (these elevations may be included as an attachment).

All maps shall be consistent with the requirements set forth in 40 CFR §270.14 and be of sufficient detail and accuracy to locate and report all current and future work performed at the site;

2. A history and description of ownership and operation, solid and hazardous waste generation, treatment, storage and disposal activities at the facility;

3. Approximate dates or periods of past waste spills, identification of the materials spilled, the amount spilled, the location where spilled, and a description of the response actions conducted (local, state, or federal response units or private parties), including any inspection reports or technical reports generated as a result of the response.

B. Nature and Extent of Contamination

The Permittee shall include in the Preliminary Report the existing information on the nature and extent of contamination.

1. The Permittee's report shall summarize all possible source areas of contamination. This, at a minimum, should include all solid waste management units. For each area, the Permittee shall identify the following:
  - a. Location of unit/area (which shall be depicted on a facility map);
  - b. Quantities of solid and hazardous wastes;
  - c. Hazardous waste, radiochemical and hazardous constituents, to the extent known; and
  - d. Identification of areas where additional information is necessary.
2. The Permittee shall prepare an assessment and description of the existing degree and extent of contamination. This should include:
  - a. Available monitoring data and qualitative information on locations and levels of contamination at the facility;
  - b. All potential migration pathways including information on geology, pedology, hydrogeology, physiography, hydrology, water quality, meteorology, and air quality; and
  - c. The potential impact(s) on human health and the environment, including demography, groundwater and surface-water use, and land use.

C. Summary Identification of Other Permits

A summary of past and present permits requested, received, and/or denied for all environmental media and enforcement actions associated with them. This must include State and Federal permits.

D. Implementation of Interim Measures

The Permittee shall document and report on all interim measures which were or are being undertaken at the facility other than those specified in the permit. This shall include:

1. Objectives of the interim measures: how the measure is mitigating a potential threat to human health and the environment and/or is consistent with and integrated into any long term solution at the facility;
2. Design, construction, operation, and maintenance requirements;
3. Schedules for design, construction and monitoring; and
4. Schedule for progress reports.

## TASK II: RFI WORKPLAN REQUIREMENTS

The Permittee shall prepare a RCRA Facility Investigation (RFI) Workplan. This RFI Workplan shall include the development of several plans, which shall be prepared concurrently. During the RCRA Facility Investigation, it may be necessary to revise the RFI Workplan to increase or decrease the detail of information collected to accommodate the facility specific situation. The RFI Workplan shall include the following:

### A. Data Collection Quality Assurance Plan

The Permittee shall prepare a plan to document all monitoring procedures: sampling, field measurements and sample analysis performed at the facility during the investigation to characterize the environmental setting, source, and contamination, so as to ensure that all information, data, and resulting decisions are technically sound, statistically valid, and properly documented.

#### 1. Data Collection Strategy

The strategy section of the Data Collection Quality Assurance Plan shall include but not be limited to the following:

- a. Description of the intended uses for the data, and the necessary level of precision and accuracy for these intended uses; and
- b. Description of methods and procedures to be used to assess the precision, accuracy and completeness of the measurement data.

#### 2. Sampling and Field Measurements

The Sampling Field Measurements Section of the Data Collection Quality Assurance Plan shall at least discuss:

- a. Selecting appropriate sampling and field measurements locations, depths, etc.;
- b. Providing a statistically sufficient number of sampling and field measurement sites;
- c. Determining conditions under which sampling or field measurements should be conducted;
- d. Determining which parameters are to be measured and where;
- e. Selecting the frequency of sampling and length of sampling period;
- f. Selecting the types of sample (e.g., composites vs. grabs) and number of samples to be collected;
- g. Measures to be taken to prevent contamination of sampling or field measurements equipment and cross contamination between sampling points;

- h. Documenting field sampling operations and procedures;
- i. Selecting appropriate sample containers;
- j. Sample preservation; and
- k. Chain-of-custody.

3. Sample Analysis

- a. Chain-of-custody procedures;
- b. Sample storage procedures and holding times;
- c. Sample preparation methods;
- d. Analytical procedures;
- e. Calibration procedures and frequency;
- f. Data reduction, validation and reporting; and
- g. Internal quality control checks, laboratory performance and systems audits and frequency.

B. Data Management Plan

The Permittee shall develop and initiate a Data Management Plan to document and track investigation data and results. This plan shall identify and set up data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents. The plan shall also provide the format to be used to present the raw data and conclusions of the investigation, such as:

- 1. Data Record;
- 2. Tabular Displays; and
- 3. Graphical Displays.

C. Health and Safety Plan

The Permittee shall prepare a facility Health and Safety Plan.

- 1. Major elements of the Health and Safety Plan shall include:
  - a. Facility description including availability of resources such as roads, water supply, electricity and telephone service;
  - b. Describe the known hazards and evaluate the risks associated with the incident and with each activity conducted;

- c. List key personnel and alternatives responsible for site safety, responses operations, and for protection of public health;
  - d. Delineate work area;
  - e. Describe levels of protection to be worn by personnel in work area;
  - f. Establish procedures to control site access;
  - g. Describe decontamination procedures for personnel and equipment;
  - h. Establish site emergency procedures;
  - i. Address emergency medical care for injuries and toxicological problems;
  - j. Describe requirements for an environmental field monitoring program;
  - k. Specify any routine and special training required for responders; and
  - l. Establish procedures for protecting workers from weather-related problems.
2. The Facility Health and Safety Plan shall be consistent with:
- a. NIOSH Occupation Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);
  - b. EPA Order 1440.1 - Respiratory Protection;
  - c. EPA Order 1440.3 - Health and Safety Requirements for Employees engaged in Field Activities;
  - d. Approved Facility Contingency Plan;
  - e. EPA Operating Safety Guide (1984);
  - f. OSHA regulations particularly in 29 CFR 1910 and 1926;
  - g. State and local regulations; and
  - h. Other EPA guidance as provided.

D. Community Relations Plan

...The Permittee shall prepare a Community Relations Plan (CRP) as part of the RCRA Facility Investigation (RFI) Workplan which allows for public participation in the RFI process. The CRP will include:

1. Establishing an active mailing list of interested parties (to be updated annually), including those on the official facility mailing list who wish to be on LANL's list;
2. Informal meetings, including briefings and workshops as appropriate, with the public and local officials before and during the RFI process, which includes activities associated with the RFI Workplan and RFI report;
3. News releases, fact sheets, approved RFI Workplans, RFI final reports, Special Permit Conditions Reports and publicly available quarterly progress reports that explain the progress and conclusions of the RFI;
4. Creation of a public information repository and reading room;
5. Updates of materials in the information repository and public reading room;
6. Public tours and briefings to inform and to listen informally to public concerns and answer individual questions;
7. Quarterly technical progress reports for the Administrative Authority; and
8. Procedures for immediate notification of the San Idelfonso Pueblo or other affected parties in case of a newly discovered off-site release which could impact them.

E. Project Management Plan

The LANL Installation RI/FS Workplan shall contain a Project Management Plan which will include a discussion of the technical approach, schedules, budget, and key projects. The Project Management Plan shall include a description of qualifications of key project performing or directing the RFI, including contractor personnel. This plan shall also document the overall management approach to the RCRA Facility Investigation. The Task specific Workplan must document any deviations from the Installation Workplan.

### TASK III: FACILITY INVESTIGATION

The Permittee shall conduct those investigations of SWMUs previously identified with known or suspected releases or potential releases for the lifetime of the wastes involved, of contamination as necessary to protect human health and the environment to: characterize the facility (Environmental Setting); define the source (Source Characterization); define the degree and extent of contamination (Contamination Characterization); and identify actual or potential receptors.

Investigations should result in data of adequate technical quality to support the development and evaluation of the corrective measure alternative or alternatives during the Corrective Measures Study, when necessary.

The facility investigation activities shall when conducted follow the plans set forth in Task II. All sampling and analyses shall be conducted in accordance with the Data Collection Quality Assurance Plan. All sampling locations shall be documented in a log and identified on a detailed site map.

#### A. Environmental Setting

The Permittee shall collect information to supplement and verify existing information on the environmental setting at the facility. The Permittee shall characterize the following:

##### 1. Hydrogeology

The Permittee shall conduct a program to evaluate hydrogeologic conditions at the facility. This program shall provide the following information:

- a. A description of the regional and facility specific geologic and hydrogeologic characteristics affecting ground-water flow beneath the facility;
- b. An analysis of any topographic features that might influence the groundwater flow system. (Note: Stereographic analysis of aerial photographs may aid in this analysis);
- c. An analysis of fractures within the tuff, addressing tectonic trend fractures versus cooling fractures;
- d. Based on field data, tests, (gamma and neutron logging of existing and new wells, piezometers and borings) and cores, a representative and accurate classification and description of the hydrogeologic units which may be part of the migration pathways at the facility (i.e., the aquifers and any intervening saturated and unsaturated units);
- e. Based on field studies and cores, structural geology and hydrogeologic cross sections showing the extent (depth, thickness, lateral extent) of hydrogeologic units which may be part of the migration pathways identifying:
  - i) Unconsolidated sand and gravel deposits,

- ii) Zones of fracturing or channeling in consolidated or unconsolidated deposits, and
  - iii) Zones of high permeability or low permeability that might direct and restrict the flow of contaminants.
- f. Based on data obtained from groundwater monitoring wells and piezometers installed upgradient and downgradient of the potential contaminant source, a representative description of water level or fluid pressure monitoring;
  - g. A description of manmade influences that may affect the hydrogeology of the site; and
  - h. Analysis of available geophysical information and remote sensing information such as infrared photography and Landsat imagery.

## 2. Soils

The Permittee shall conduct a program to characterize the soil and rock units above the water table in the vicinity of the contaminant release(s). Trace element geochemistry should be investigated as a means of differentiating units within the tuff. Such characterization shall include, but not be limited to, the following information.

- a. Surface soil distribution;
- b. Soil profile, including ASTM classification of soils;
- c. Transects of soil stratigraphy;
- d. Saturated hydraulic conductivity;
- e. Porosity;
- f. Cation exchange capacity (CEC);
- g. Soil pH;
- i. Particle size distribution;
- j. Depth of water table;
- k. Moisture content;
- l. Effect of stratification on unsaturated flow;
- m. Infiltration;
- n. Evapotranspiration;
- o. Residual concentration of contaminants in soil;

- p. Mineral and metal content;
- q. Trace element geochemistry as a means of differentiating units within the tuff; and
- r. Water balance scenarios.

B. Source Characterization

The Permittee shall collect analytical data to completely characterize the wastes and the areas where wastes have been placed, including: type; quantity; physical form; disposition (containment or nature of deposits); and the facility characteristics affecting release (e.g., facility security, and engineered barriers). This shall include quantification of the following specific characteristics, at each source area:

1. Unit/Disposal Area Characteristics

The RFI Work Plan shall propose the Task Site specific maps with an appropriate scale and the following features; wetlands, floodplains water features, drainage patterns, springs, faults, gravel deposits and alluvium.

- a. Location of unit/disposal area;
- b. Type of unit/disposal area;
- c. Design features;
- d. Operating practices (past and present);
- e. Period of operation;
- f. Age of unit/disposal area;
- g. General physical conditions; and
- h. Method used to close the unit/disposal area.

2. Waste Characteristics

- a. Type of waste placed in unit;
- b. Physical and chemical characteristics; and
- c. Migration and dispersal characteristics of the waste.

The Permittee shall document the procedures used in making the above determinations.

C. Contamination Characteristics

The Permittee shall collect analytical data on groundwater, soils, surface water, sediment, and subsurface gas contamination when necessary to characterize contamination from a SWMU. This data shall be sufficient to define the extent, origin, direction, and rate of movement of contaminant plumes. Data shall include time and location of sampling, media sampled, concentrations found, conditions during sampling, and the identity of the individual(s) performing the sampling and analysis. The Permittee shall address the following types of contamination at the facility:

1. Groundwater Contamination

The Permittee shall conduct a Groundwater Investigation to characterize any plumes of contamination at the facility. This investigation shall at a minimum provide the following information:

- a. A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the facility;
- b. The horizontal and vertical direction of contamination movement;
- c. The velocity of contaminant movement;
- d. The horizontal and vertical concentration profiles of any Appendix IX constituents and radiochemical constituents in the plume(s);
- e. An evaluation of factors influencing the plume movement; and
- f. An extrapolation of future contaminant movement.

The Permittee shall document the procedures used in making the above determinations (e.g., well design, well construction, geophysics, modeling, etc.).

2. Soil Contamination

The Permittee shall conduct an investigation to characterize the contamination of the soil and rock units above the water table in the vicinity of the contaminant release. The investigation shall include the following information:

- a. A description of the vertical and horizontal extent of contamination;
- b. A description of contaminant and soil chemical properties within the contaminant source area and plume migration and transformation;

- c. Specific contaminant concentrations;
- d. The velocity and direction of contaminant movement; and
- e. An extrapolation of future contaminant movement that includes worst case scenarios over the life of the wastes involved.

The Permittee shall document the procedures used in making the above determinations.

### 3. Surface Water Contamination

The Permittee shall conduct a surface water investigation to characterize contamination in surface water bodies resulting from contaminant releases at the facility. The investigation shall include the following:

- a. A description of the horizontal and vertical extent of any immiscible or dissolved plumes originating from the facility, and the extent of contamination in the underlying sediments;
- b. The horizontal and vertical direction and velocity of contaminant movement;
- c. An evaluation of the physical, biological, chemical, and radiochemical factors influencing contaminant movement;
- d. An extrapolation of future contaminant movement; and
- e. A description of the chemistry and radiochemistry of the contaminated surface waters and sediments. This includes determining the pH, total dissolved solids, specific contaminant concentrations, etc.

The Permittee shall document the procedures used in making the above determinations.

### 4. Air Contamination

The Permittee shall conduct an investigation to characterize the particulate and gaseous contaminants released into the atmosphere.

This investigation shall provide the following information:

- a. A description of the horizontal and vertical direction and velocity of contaminant movement;
- b. The rate and amount of the release.
- c. The chemical, radiochemical, and physical composition of the contaminants released, including horizontal and vertical concentration profiles; and

d. Possibility of future airborne releases.

5. Subsurface Gas

The Permittee shall provide information characterizing the nature, rate and extent of releases of reactive gases from the units. Such information shall include, but not be limited to: provisions for monitoring subsurface gases released from the unit; and an assessment of the potential for these releases to have a threat to human health and environment. The Permittee shall document the procedures used in making the above determination.

D. Potential Receptors

The Permittee shall collect data describing the human populations and environmental systems that are susceptible to contaminant exposure from the facility. Chemical and radiochemical analysis of biological samples may be needed. Data on observable effects in ecosystems may also be obtained.

TASK IV: INVESTIGATIVE ANALYSIS

The Permittee shall prepare an analysis and summary of all facility investigations and their results. The objective of this task shall be to ensure that the investigation data are sufficient in quality (e.g., quality assurance procedures have been followed) and quantity to describe the nature and extent of contamination, potential threat to human health and/or the environment, and to support the Corrective Measures Study, if one is required.

The Permittee shall analyze all facility investigation data outlined in Task III and prepare a report on the type and extent of contamination at the facility including sources and migration pathways. The report shall describe the extent of contamination (qualitative/quantitative) in relation to the background levels indicative for the area.

The Permittee shall identify all relevant and applicable standards for the protection of human health and the environment (e.g. National Ambient Air Quality Standards, Federally-approved state water quality standards, Groundwater protection standards, etc.)

TASK V: REPORTS

A. Preliminary and Workplan

The Permittee shall submit to the Administrative Authority the Preliminary Report (Task I) (OTET) and the RCRA Facility Investigation Workplan (Task II) (OTET) as described in the Permit.

B. Progress

Within 60 days of the effective date of this permit, the Permittee shall provide the Administrative Authority with signed, monthly management status reports containing:

1. A description and estimate of the percentage of the RFI (OTET) completed;
2. Summaries of contacts pertaining to corrective action with representatives of the local community, public interest groups or State government during the reporting period;
3. Summaries of problems or potential problems encountered during the reporting period;
4. Actions being taken to rectify problems;
5. Changes in key project personnel during the reporting period; and
6. Projected work for the next reporting period.

C. Technical Quarterly Progress Reports

Beginning February 15, 1990, the Permittee shall submit a technical progress report for the previous quarter, which shall at a minimum, summarize the work performed, and supply the results of sampling and analysis.

D. Draft and Final

RCRA FACILITY INVESTIGATION REPORT AND SUMMARY

1. Within sixty (60) calendar days after the completion of either phase of the RFI, (OTET), the Permittee shall submit an RFI Report (OTET) and a Summary Report. The RFI Report (OTET) shall describe the procedures, methods, and results of all investigations of SWMUs and their releases, including information on the type and extent of contamination at the facility, sources and migration pathways, and actual or potential receptors. The Phase 2 RFI Report (OTET) shall present all information gathered under the approved RFI Work Plan (OTET). The Phase 2 Report must contain adequate information to support further corrective action decisions at the facility. The Summary shall describe more briefly the procedures, methods, and results from the facility investigation described in the Scope of Work for RFI, Task III.
2. After the Permittee submits either phase of the RFI Report and a Summary, the Administrative Authority shall either approve or disapprove the reports in writing.

If the Administrative Authority approved the RFI Report and Summary, the Permittee shall mail the approved Summary Report to all individuals on the facility mailing list established pursuant to 40 CFR 124.10(c) (1)(ix), within fifteen (15) calendar days of receipt of approval.

If the Administrative Authority determines the RFI Final Report and Summary do not fully detail the objectives stated under Permit Condition P, the Administrative Authority may disapprove the RFI Final Report and Summary. If the Administrative Authority disapproves the Report, the Administrative Authority shall notify the Permittee in writing of the Reports' deficiencies and specify a due date for submittal of a revised Final Report and Summary. Once approved, the Summary shall be mailed to all individuals on the facility mailing list.

Two hard copies and one compatible disk copy of all reports, including the Task I report (OTET), Task II workplan (OTET) and both the Draft and Final RFI Reports (Task III-IV) (OTET) shall be provided by the Permittee to the Administrative Authority.

RFI Submission Summary

A summary of the information reporting requirements contained in the RCRA Facility Investigation Scope of Work (OTET) is presented below:

<u>Facility Submission</u>	<u>Due Date</u>
LANL Installation RI/FS Workplan	180 days*
LANL Task/Site RI/FS Documents**	
Monthly Management Status Reports	Monthly
Technical Progress Reports	Quarterly

\* Dates are calculated from the effective date of this permit unless otherwise specified.

\*\*Dates will be as specified in the LANL Installation RI/FS Workplan

Q. SCOPE OF WORK FOR A RCRA CORRECTIVE MEASURE STUDY (CMS)  
AT  
LOS ALAMOS NATIONAL LABORATORY

PURPOSE

The purpose of this Corrective Measure Study (CMS) is to develop and evaluate the corrective action alternative or alternatives and to recommend the corrective measure or measures to be taken at Los Alamos National Laboratory. The Permittee will furnish the personnel, materials, and services necessary to prepare the CMS, except as otherwise specified.

If the Permittee believes that certain requirements of the scope of work are not applicable, the specific requirements shall be identified and the rationale for inapplicability shall be provided. This scope of work should be modified as necessary to require only that information necessary to complete the RCRA CMS.

SCOPE

The Corrective Measure Study consists of four tasks. Those tasks, and the ER Program documents/activities that are equivalent to the CMS documents/ activities are listed on the following page. The permittee shall prepare a single installation-wide work plan, which shall be updated annually, and task specific RI/FS documents for each task. The installation-wide work plan shall contain programmatic operating procedures, tabular summaries of the potential release sites, prioritization of the site/tasks, and a work schedule by task (including a current year work plan). The task specific RI/FS documents/activities shall be prepared as tasks are implemented. The detailed outlines for the task specific RI/FS documents shall be provided in the installation-wide work plan.

Scope of CMS	ER Program Equivalent	
<p><u>The Corrective Measures Study consists of four tasks:</u></p>	<p><u>LANL Installation RI/FS Work Plan</u></p>	<p><u>Feasibility Study</u></p>
<p>Task VI: Identification and Development of the Corrective Measure Alternative or Alternatives</p> <ul style="list-style-type: none"> <li>A. Description of Current Situation</li> <li>B. Establishment of Corrective Action Objectives</li> <li>C. Laboratory and Bench-Scale Study</li> <li>D. Screening of Corrective Measures Technologies</li> <li>E. Identification of the Corrective Measure Alternative or Alternatives</li> </ul>	<p>VI.</p>	<p>VI. Identification and Development of the Remedial Action Alternative or Alternatives</p> <ul style="list-style-type: none"> <li>A. Description of Current Situation</li> <li>B. Establishment of Remedial Action Objectives</li> <li>C. Bench-Scale and Pilot Studies</li> <li>D. Screening of Remedial Technologies</li> <li>E. Identification of the Remedial Alternative or Alternatives</li> </ul>
<p>Task VII: Evaluation of the Corrective Measure Alternative(s)</p> <ul style="list-style-type: none"> <li>A. Technical/Environmental/Human Health/Institutional</li> <li>B. Cost Estimate</li> </ul>	<p>VII.</p>	<p>VII. Evaluation of the Remedial Alternative(s)</p> <ul style="list-style-type: none"> <li>A. Technical/Environmental/Human Health/Institutional</li> <li>B. Cost Estimate</li> </ul>
<p>Task VIII: Justification and Recommendation of the Corrective Measure or Measures</p> <ul style="list-style-type: none"> <li>A. Technical</li> <li>B. Human Health</li> <li>C. Environmental</li> </ul>	<p>VIII.</p>	<p>VIII. Justification and Recommendation of the Remedial Measure or Measures</p> <ul style="list-style-type: none"> <li>A. Technical</li> <li>B. Human Health</li> <li>C. Environmental</li> </ul>
<p>Task IX: Reports</p> <ul style="list-style-type: none"> <li>A. Progress</li> <li>B. Draft</li> <li>C. Final</li> </ul>	<p>IX. Reports</p> <ul style="list-style-type: none"> <li>A. LANL Installation RI/FS Work Plan</li> <li>B. Annual Update of LANL Installation RI/FS Work Plan</li> <li>C. Draft and Final</li> </ul>	<p>IX. Reports</p> <ul style="list-style-type: none"> <li>A. LANL Task/Site RI/FS Documents and LANL Monthly Management</li> <li>B. Draft</li> <li>C. Final</li> </ul>

TASK VI: IDENTIFICATION AND DEVELOPMENT OF THE CORRECTIVE ACTION ALTERNATIVE OR ALTERNATIVES

Based on the results of the RCRA Facility Investigation (RFI) and consideration of the identified Preliminary Corrective Measure Technologies (Task I) the Permittee shall identify, screen, and develop the alternative(s) for removal, containment, treatment and/or other remediation of the contamination based on the objectives established for the corrective action.

A. Description of Current Situation

The Permittee shall submit an update to the information describing the current situation at the facility and the known nature and extent of the contamination as documented by the RFI report. The Permittee shall provide an update to information presented in Task I of the RFI to the Administrative Authority regarding previous response activities and any interim measures which have or are being implemented at the facility. The Permittee shall also make a facility-specific statement of the purpose for the response, based on the results of the RFI. The statement of purpose should identify the actual or potential exposure pathways that should be addressed by corrective measures.

B. Establishment of Corrective Action Objectives

The Permittee, in conjunction with the Administrative Authority, shall establish site specific objectives for the corrective action. These objectives shall be based on public health and environmental criteria, information gathered during the RCRA Facility Investigation, EPA guidance and the requirements of any applicable Federal statutes. At a minimum, all corrective actions concerning groundwater releases from solid waste management units must be consistent with, and as stringent as, those required under 40 CFR 264.100.

C. Laboratory and Bench-Scale Study

When a new technology is being proposed or similar waste streams have not routinely been treated or disposed using the technology the Permittee shall conduct laboratory and/or bench-scale studies to determine the applicability of a corrective measure technology or technologies to the facility conditions. The Permittee shall analyze the technologies, based on literature review, vendor contracts, and past experience to determine the testing requirements.

The Permittee shall develop a testing plan identifying the type(s) and goal(s) of the study(ies), the level of effort needed, and the procedures to be used for data management and interpretation.

Upon completion of testing, the Permittee shall evaluate the testing results to assess the technology or technologies with respect to the site-specific questions identified in the test plan.

The Permittee shall prepare a report summarizing the testing program and its results, both positive and negative.

D. Screening of Corrective Measure Technologies

The Permittee shall review the results of the RFI and reassess the technologies specified in Task II and identify any additional technologies which are applicable to the facility. The Permittee shall screen the preliminary corrective measure technologies identified in Task II of the RFI and any supplemental technologies to eliminate those that may prove not feasible to implement, that rely on technologies unlikely to perform satisfactorily or reliably, or that do not achieve the corrective measure objective within a reasonable time period. This screening process focuses on eliminating those technologies which have severe limitations for a given set of waste and site-specific conditions. The screening step may also eliminate technologies based on inherent technology limitations.

Site, waste, and technology characteristics which are used to screen inapplicable technologies are described in more detail below:

1. Site Characteristics

Site data should be reviewed to identify conditions that may limit or promote the use of certain technologies. Technologies whose use is clearly precluded by site characteristics should be eliminated from further consideration;

2. Waste Characteristics

Identification of waste characteristics that limit the effectiveness or feasibility of technologies is an important part of the screening process. Technologies clearly limited by these waste characteristics should be eliminated from consideration. Waste characteristics particularly affect the feasibility of in-situ methods, direct treatment methods, and land disposal (on/off-site); and

3. Technology Limitations

The level of technology development, performance record, and inherent construction, operation and maintenance problems shall be identified for each technology considered. Technologies that are unreliable, perform poorly, or are not fully demonstrated may be eliminated in the screening process. For example, certain treatment methods have been developed to a point where they can be implemented in the field without extensive technology transfer or development.

E. Identification of the Corrective Measure Alternatives

The Permittee shall develop the corrective measure alternatives based on the corrective measure objectives and analysis of Preliminary Corrective Measure Technologies, as presented in Task I of the RFI as supplemented following the preparation of the RFI report. The Permittee shall rely on engineering practice to determine which of the previously identified technologies appear most suitable for the site. Technologies can be combined to form the overall corrective action alternatives. The alternatives developed should represent a workable number of options that each appear to adequately address all site problems and corrective action objectives. Each alternative may consist of an individual technology or a combination of technologies. The Permittee shall document the reasons for excluding technologies, identified in Task I, as supplemented in the development of the alternative.

TASK VII: EVALUATION OF THE CORRECTIVE MEASURE ALTERNATIVE OR ALTERNATIVES

The Permittee shall describe each corrective measure alternative that passed the Initial Screening in Task VI and evaluate each corrective measure alternative and its components. The evaluation shall be based on technical, environmental, human health and institutional concerns. The Permittee shall also develop cost estimates for each corrective measure.

A. Technical/Environmental/Human Health/Institutional

The Permittee shall provide a description of each corrective measure alternative which includes but is not limited to the following: preliminary process flow sheets; preliminary sizing and type of construction for buildings and structures; and rough quantities of utilities required. The Permittee shall evaluate each alternative in the four following areas:

1. Technical

The Permittee shall evaluate each corrective measure alternative based on performance, reliability, implementability and safety.

- a. The Permittee shall evaluate performance based on the effectiveness and useful life of the corrective measure:
  - i) Effectiveness shall be evaluated in terms of the ability to perform intended functions such as containment, diversion, removal, destruction, or treatment. The effectiveness of each corrective measure shall be determined either through design specifications or by performance evaluation. Any specific waste or site characteristics which could potentially impede effectiveness shall be considered. The evaluation should also consider the effectiveness of combinations of technologies; and
  - ii) Useful life is defined as the length of time the level of effectiveness can be maintained. Most corrective measure technologies, with the exception of destruction, deteriorate with time. Often, deterioration can be slowed through proper system operation and maintenance, but the technology eventually may require replacement. Each corrective measure shall be evaluated in terms of the projected service lives of its component technologies. Resource availability in the future life of the technology, as well as appropriateness of the technologies, must be considered in estimating the useful life of the project.

- b. The Permittee shall provide information on the reliability of each corrective measure including their operation and maintenance requirements and their demonstrated reliability:
  - i) Operation and maintenance requirements include the frequency and complexity of necessary operation and maintenance. Technologies requiring frequent or complex operation and maintenance activities should be regarded as less reliable than technologies requiring little or straightforward operation and maintenance. The availability of labor and materials to meet these requirements shall also be considered; and
  - ii) Demonstrated and expected reliability is a way of measuring the risk and effect of failure. The Permittee should evaluate whether the technologies have been used effectively under analogous conditions; whether the combination of technologies have been used together effectively; whether failure of any one technology has an immediate impact on receptors; and whether the corrective measure has the flexibility to deal with uncontrollable changes at the site.
- c. The Permittee shall describe the implementability of each corrective measure including the relative ease of installation (constructibility) and the total time required to achieve a given level of response:
  - i) Constructibility is determined by conditions both internal and external to the facility conditions and includes such items as location of underground utilities, depth to water table, heterogeneity of subsurface materials, and location of the facility (i.e., remote location vs. a congested urban area). The Permittee shall evaluate what measures can be taken to facilitate construction under these conditions. External factors which affect implementation include the need for special permits or agreements, equipment availability, and the location of suitable off-site treatment or disposal facilities;
  - ii) Time has two components that shall be addressed: the time it takes to implement a corrective measure and the time it takes to actually see beneficial results. Beneficial results are defined as the reduction of contaminants to some acceptable, pre-established level.
- d. The Permittee shall evaluate each corrective measure alternative with regard to safety. This evaluation shall include threats to the safety of nearby communities and environments as well as those to workers during implementation. Factors to consider include fire, explosion, and exposure to hazardous substances.

2. Environmental

The Permittee shall perform an Environmental Assessment for each alternative. The Environmental Assessment shall focus on facility conditions and pathways of contamination actually addressed by each alternative. The Environmental Assessment for each alternative will include, at a minimum, an evaluation of: the short- and long-term beneficial and adverse effects of the response alternative; any adverse effects on environmentally sensitive areas; and an analysis of measures to mitigate adverse impacts.

3. Human Health

The Permittee shall assess each alternative in terms of the extent which it mitigates short- and long-term potential exposure to any residual contamination and protects human health both during and after implementation of the corrective measure. The assessment will describe the levels and characterizations of contaminants on-site, potential exposure routes, and potentially affected populations. Each alternative will be evaluated to determine the level of exposure to contaminants and the reduction over time. For management of mitigation measures, the relative reduction of impact will be determined by comparing residual levels of each alternative with existing criteria, standards, or regulations acceptable to the Administrative Authority.

4. Institutional

The Permittee shall assess relevant institutional needs for each alternative. Specifically, the effects of Federal, State, and local environmental and public health standards, regulations, guidance, advisories, ordinances, or community relations on the design, operation, and timing of each alternative.

B. Cost Estimate

The Permittee shall develop an estimate of the cost of each corrective measure alternative (and for each phase or segment of the alternative). The cost estimate shall include capital, and operation and maintenance costs.

1. Capital costs consist of direct (construction) and indirect (nonconstruction and overhead) costs.

- a. Direct capital costs include:

- i) Construction costs: Cost of materials, labor (including fringe benefits and worker's compensation), and equipment required to install the corrective measure alternative.
- ii) Equipment costs: Costs of treatment, containment, disposal and/or service equipment necessary to implement the action; these materials remain until the corrective action is completed;

- iii) Land and site development costs: Expenses associated with purchase of land and development of existing property; and
  - iv) Building and services costs: Costs of process and nonprocess buildings, utility connections, purchased services, and disposal costs.
- b. Indirect capital costs include:
- i) Engineering expenses: Costs of administration, design construction supervision, drafting, and testing of corrective measure alternatives;
  - ii) Legal fees and license or permit costs: Administrative and technical costs necessary to obtain licenses and permits for installation and operation;
  - iii) Start-up and shakedown costs: Costs incurred during corrective measure start-up; and
  - iv) Contingency allowances: Funds to cover costs resulting from unforeseen circumstances, such as adverse weather conditions, strikes, and inadequate facility characterization.
2. Operation and maintenance costs are post-construction costs necessary to ensure continued effectiveness of a corrective measure. The Permittee shall consider the following operation and maintenance cost components:
- a. Operating labor costs: Wages, salaries, training, overhead, and fringe benefits associated with the labor needed for post-construction operation;
  - b. Maintenance materials and labor costs: Costs for labor, parts, and other resources required for routine maintenance of facilities and equipment;
  - c. Auxiliary materials and energy: Costs of such items as chemicals and electricity for treatment plant operations, water and sewer service, and fuel;
  - d. Purchased services: Sampling costs, laboratory fees, and professional fees for which the need can be predicted;
  - e. Disposal and treatment: Costs of transporting, treating, and disposing of waste materials, such as treatment plant residues generated during operation;
  - f. Administrative costs: Costs associated with administration of corrective measure operation and maintenance not included under other categories;

- g. Insurance, taxes, and licensing costs: Costs of such items as liability and sudden accidental insurance; real estate taxes on purchased land or rights-of-way; licensing fees for certain technologies; and permit renewal and reporting costs;
- h. Maintenance reserve and contingency funds: Annual payments into escrow funds to cover (1) costs of anticipated replacement or rebuilding of equipment and (2) any large unanticipated operation and maintenance costs; and
- i. Other costs: Items that do not fit any of the above categories.

TASK VIII. JUSTIFICATION AND RECOMMENDATION OF THE CORRECTIVE MEASURE OR MEASURES

The Permittee shall justify and recommend a corrective measure alternative using technical, human health, and environmental criteria. This recommendation shall include summary tables which allow the alternative or alternatives to be understood easily. Trade-offs among health risks, environmental effects, and other pertinent factors shall be highlighted. At a minimum, the following criteria will be used to justify the final corrective measure or measures.

A. Technical

1. Performance - corrective measure or measures which are most effective at performing their intended functions and maintaining the performance over extended periods of time will be given preference;
2. Reliability - corrective measure or measures which do not require frequent or complex operation and maintenance activities and have proven effective under waste and facility conditions similar to those anticipated will be given preference;
3. Implementability - corrective measure or measures which can be constructed and operated to reduce levels of contamination to attain or exceed applicable standards in the shortest period of time will be preferred; and
4. Safety - corrective measure or measures which pose the least threat to the safety of nearby residents and environments as well as workers during implementation will be preferred.

B. Human Health

The corrective measure or measures must comply with existing U.S. EPA criteria, standards, or regulations for the protection of human health. Corrective measures which provide the minimum level of exposure to contaminants and the maximum reduction in exposure with time are preferred.

C. Environmental

The corrective measure or measures posing the least adverse impact (or greatest improvement) on the environment over the shortest period of time will be favored.

TASK IX: REPORTS

The Permittee shall prepare a Corrective Measure Study Report (OTET) presenting the results of Tasks VII through IX recommending a corrective measure alternative. Two (2) copies and one compatible disk copy of the draft and final reports shall be provided to the the Administrative Authority by the Permittee.

A. Progress

The Permittee shall at a minimum provide the Administrative Authority with signed monthly management status reports containing:

1. A description and estimate of the percentage of the CMS(OTET) completed;
2. Summaries of contacts relevant to corrective action with representatives of the local community, public interest groups or State government during the reporting period;
3. Summaries of problems or potential problems relevant to corrective action encountered during the reporting period;
4. Actions being taken to rectify problems;
5. Changes in key project personnel during the reporting period; and
6. Projected work for the next reporting period.

B. Draft

The Report shall at a minimum include:

1. A summary of the corrective measure or measures and rationale
  - a. Description of the corrective measure or measures and rationale for selection;
  - b. Performance expectations;
  - c. Preliminary design criteria and rationale;
  - d. General operation and maintenance requirements; and
  - e. Long-term monitoring requirements.

2. Design and Implementation Precautions:
  - a. Special technical problems;
  - b. Additional engineering data required;
  - c. Permits and regulatory requirements;
  - d. Access, easements, right-of-way;
  - e. Health and safety requirements; and
  - f. Community relations activities.

3. Cost Estimates and Schedules:
  - a. Capital cost estimate;
  - b. Operation and maintenance cost estimate; and
  - c. Project schedule (design, construction, operation).

C. Technical Quarterly Progress Reports

The Permittee shall submit quarterly Progress reports which summarize environmental data collected during the previous quarter.

D. Final

The Permittee shall finalize the Corrective Measure Study Report (OTET) incorporating comments received from the Administrative Authority on the Draft Corrective Measure Study Report (OTET).