5-23-90

LAND HSWA GIN Permit

HSWA LAND 5/93

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6

HAZARDOUS WASTE PERMIT

(Hazardous and Solid Waste Amendments, 1984)

15072

TL

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, REGION 6

HAZARDOUS WASTE PERMIT (HAZARDOUS AND SOLID WASTE AMENDMENTS, 1984)

PERMITTEE: University of California - Los Alamos National Laboratory
and United States Department of Energy

OWNER: United States Department of Energy

OPERATOR: University of California

ADDRESSES: University of California
P.O. Box 1663
Los Alamos, New Mexico 87545

U.S. DOE
Los Alamos Area Office
528 36th Street
Los Alamos, New Mexico 87544

I.D. NUMBER: NM0890010515

EFFECTIVE DATE: ~~April 10, 1990~~ MAY 23 1990

EXPIRATION DATE: DECEMBER 22, 1999

Pursuant to the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA), as amended (42 U.S.C. 6901, et seq.) and the Hazardous and Solid Waste Amendments of 1984 (HSWA), a permit is issued to the U.S. Department of Energy's Los Alamos Area Office and the University of California, doing business as Los Alamos National Laboratory (hereafter called the Permittee) to operate a disposal facility at the location stated above.

The Permittee must comply with all the terms and conditions of this permit. This permit consists of the conditions contained herein (including the attachments). Said conditions are needed to insure that the Permittee's hazardous waste management activities comply with all applicable Federal, statutory and regulatory requirements. Applicable requirements are those which are found in, referenced in or incorporated into that version of RCRA or the regulations promulgated to RCRA that are in effect on the date this permit is issued (see 40 CFR 270.32 (c)).

This permit is issued in part pursuant to the provisions of Sections 201, 202, 203, 206, 207, 212, 215 and 224 of HSWA which modified Sections 3004 and 3005 of RCRA. These require corrective action for all releases of hazardous waste or hazardous constituents from any solid waste management unit at a treatment, storage, or disposal facility seeking a permit, regardless of the time at which the waste was placed in such unit and provides the authority to review and modify the permit at any time. The decision to issue this permit is based on the assumption that all information contained in the permit application is accurate and that the facility will be operated as specified in the permit application. Any inaccuracies found in the application may be grounds for termination or modification of this permit (see 40 CFR 270.41, 270.42 and 270.43) and potential enforcement action.

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 8th day of March, 1990

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

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, empyting, 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 Facililty 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, ^{3}H, ^{137}Cs, ^{238}Pu, ^{240}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 turbitity units (N.T.U.)can be consistantly 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}H, ^{137}Cs, Total U, ^{238}Pu, ^{239}Pu, ^{240}Pu, ^{241}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-specfic 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 that 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 that 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 all 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 (6)
36-003 (a-c)
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
54-007 (A-C)
54-013

Technical Area 59

59-001 (1)

603 Total SWMU's

Table B - Priority SWMUs*

SWMU No.	SWMU No.
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 Administrativme 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.

O. FACILITY SUBMISSION SUMMARY

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

Facility Submission Requirements	Due Date
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 eignty (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	
The RCRA Facility Investigation consists of five tasks:	LANL Installation RI/FS Work Plan	LANL Task/Site RI/FS
Task I: Description of Current Conditions A. Facility Background B. Nature and Extent of Contamination	I. LANL Installation RI/FS Work Plan A. Installation Background B. Tabular Summary of Contamination by Site	I. Quality Assurance Project Plan A. Task/Site Background B. Nature and Extent of Contamination
Task II: RFI Workplan A. Data Collection Quality Assurance Plan B. Data Management Plan C. Health and Safety Plan D. Community Relations Plan	II. LANL Installation RI/FS Work Plan A. General Standard Operating Procedures for Sampling, Analysis and Quality Assurance B. Technical Data Management Program C. Health and Safety Program D. Community Relations Program	II. LANL Task/Site RI/FS Documents A. Quality Assurance Project Plan and Field Sampling Plan B. Technical Data Management Plan C. Health and Safety Plan D. Community Relations Plan
Task III: Facility Investigation A. Environmental Setting B. Source Characterization C. Contamination Characterization D. Potential Receptor Identification	III.	III. Task/Site Investigation A. Environmental Setting B. Source Characterization C. Contamination Characterization D. Potential Receptor Identification
Task IV: Investigative Analysis A. Data Analysis B. Protection Standards	IV.	IV. LANL Task/Site Investigative Analysis A. Data Analysis B. Protection Standards
Task V: Reports A. Preliminary and Workplan B. Progress C. Draft and Final	V. Reports A. LANL Installation RI/FS Work Plan B. Annual Update of LANL Installation RI/FS Work Plan C. Draft and Final	V. LANL Task/Site Reports A. Quality Assurance Project Plan, Field Sampling Plan, Technical Data Management Plan, Health and Safety Plan, Community Relations Plan B. LANL Task/Site RI/FS Documents and LANL Monthly Management Status Report C. Draft and Final

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 that 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 point

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 P..n.

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 invloved, 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 differenting 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 invloved.

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 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:

Facility Submission	Due Date
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 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	
The Corrective Measures Study consists of four tasks:	**LANL Installation RI/FS Work Plan**	**Feasibility Study**
Task VI: Identification and Development of the Corrective Measure Alternative or Alternatives A. Description of Current Situation B. Establishment of Corrective Action Objectives C. Laboratory and Bench-Scale Study D. Screening of Corrective Measures Technologies E. Identification of the Corrective Measure Alternative or Alternatives	VI.	VI. Identification and Development of the Remedial Action Alternative or Alternatives A. Description of Current Situation B. Establishment of Remedial Action Objectives C. Bench-Scale and Pilot Studies D. Screening of Remedial Technologies E. Identification of the Remedial Alternative or Alternatives
Task VII: Evaluation of the Corrective Measure Alternative(s) A. Technical/Environmental/ Human Health/Institutional B. Cost Estimate	VII.	VII. Evaluation of the Remedial Alternative(s) A. Technical/Environmental/Human Health/Institutional B. Cost Estimate
Task VIII: Justification and Recommendation of the Corrective Measure or Measures A. Technical B. Human Health C. Environmental	VIII.	VIII. Justification and Recommendation of the Remedial Measure or Measures A. Technical B. Human Health C. Environmental
Task IX: Reports A. Progress B. Draft C. Final	IX. Reports A. LANL Installation RI/FS Work Plan B. Annual Update of LANL Installation RI/FS Work Plan C. Draft and Final	IX. Reports A. LANL Task/Site RI/FS Documents and LANL Monthly Management B. Draft C. Final

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 it's 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).