

5/21/92

PLAN LANL PROPOSED
TO STATE

Mr. Jerry Bellows
Area Manager
U.S. Department of Energy
Los Alamos Area Office
Los Alamos, New Mexico 87544

Dear Mr. Bellows:

**PROPOSED ACTION PLAN FOR REMEDIATING PADS 1, 2, AND 4 AT
TECHNICAL AREA 54, AREA G**

Enclosed is a draft letter and a proposed, detailed Action Plan to Mr. Benito Garcia of the New Mexico Environment Department (NMED). This submittal satisfies the request by the NMED in support of remediation activities at Technical Area 54, Area G pads 1, 2, and 4.

The enclosed Action Plan provides a comprehensive explanation the proposed phased approach for addressing the corrosion problem identified during meetings with your staff and the NMED. A Task Order authorizing a preconceptual design study for project facilities is being developed to provide a basis for engineering designs and cost estimates.

Preparation of detailed engineering designs, workplans, health and safety plans will not commence until NMED tacitly approves and the Department of Energy commits to funding (i.e. from FY92 to final pad closures) the enclosed draft plan. The Los Alamos National Laboratory requests your assistance in moving forward to proceed with implementation of the plan as quickly as possible. My staff has included several key points that require special attention:

1) Central Control Facility

In addition to the key facilities discussed at the NMED presentation on May 13 (the Drum Preparation Facility, the Drum Vent System, the Waste Package Remediation Facility, and the RCRA-compliant Engineered Short-Term Storage Facility), this additional facility is needed in the short term for project implementation. The Central Control Facility will provide necessary change rooms, office space, restroom facilities, and access control to the TA-54-East facility.

This project will be undertaken at the planned TA-54-East facility, which is located a considerable distance from existing TA-54 offices and worker support facilities. This facility will provide necessary worker support appurtenances such as restrooms, drinking water supply, worker change areas, radiation monitoring stations, emergency equipment, and access control to adjacent project

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TA-54

work areas.

2) Site Preparation Activities

In order to prepare the planned TA-54-East facility for acceptance of containers following their recovery, site preparation activities including surveying, fencing, development of roads, remediation of Indian ruins if necessary, and other activities must commence in FY92/FY93. Costs for these actions were not accounted for in our preliminary estimates of additional funding.

3) Scope/Activity

a. FY92 Scope/Activity

The original preliminary estimates of additional funding needed in FY92 and FY93 (\$740K and \$3,525K, respectively) have been revised. The LANL EM program has been able to reprioritize and downscale waste management activities so that \$200K has been made available to support this effort in FY92. Currently available GPP funds will be utilized to begin the design of the three domes to cover Pads 1, 2, and 4. Full implementation of this plan, however, requires the following activities to be completed in FY92:

- i. Pre-conceptual Design Study (\$200K);
- ii. Design of enhanced environmental surveillance programs identified in the Assessment Plan (\$150K); and
- iii. Design of enhanced monitoring programs identified in the Assessment Plan (\$100).

Monies required in FY92 to complete these activities total \$450K. Therefore, we are requesting an additional \$250K from DOE in FY92 to augment this effort.

b. FY93 Scope/Activity

Activities requiring additional funding in FY93 include the following:

- i. Implementation of environmental surveillance program/systems identified in the Assessment Plan (\$300K); and
- ii. Implementation of monitoring program identified

in the Assessment Plan (\$200K).

In addition to the above activities, design, procurement, and construction of three domes over the pads is required. This activity will require three separate GPP funded projects. Each dome will require \$1.2M GPP (total of \$3.6M) to complete. Therefore, additional funds required in FY93 total \$4.1M (\$500K operating and \$3,600K GPP). A more detailed discussion of the GPP activity follows:

While site preparation, construction of footings, and completion of designs and specifications for the three tension-support domes could be completed as a General Plant Project (GPP), acquisition of the three required domes would have to be accomplished as several discrete GPPs due to cost ceiling limitations of the GPP process (estimated cost to purchase the three domes is \$1.8 million, which does not include design, site preparation, dome construction, installation of utilities, fire protection, and other monitoring systems, etc.). The following acquisition strategy is required to expedite the completion of these facilities:

- i. Use of Task Order A-E firm for GPP design; and
- ii. Use of JCI for GPP construction.

In addition, prompt DOE approval of GPP authorization documents is required. LANL will wait until the FY93 EM budget is finalized before making its request for additional funds.

- o This Action Plan will require multiple GPP funded RCRA-compliant short-term storage facilities. The first storage facility will require GPP funding in FY93. Additional storage facilities, as identified in the Pre-conceptual Design Study, will require GPP funding in consecutive fiscal years. These storage facilities will be required to store recovered waste containers in inspectable arrays following recovery, venting, assay, and repackaging. Your support of this approach is required in order for these facilities to be completed.
- o While funding requirements for some of the actions and facilities making up longer-term phases of this project are currently addressed in Five-Year Plan budgets for FY95 and beyond (i.e., those elements which were already part of the TRU Work-off Plan and included in ADS/TDD 4154), it

must be reemphasized that the additional funding required to implement this plan immediately was not identified (and could not have been foreseen) in the ER/WM Five-Year Plan. Full implementation of this plan, following NMED approval, will impact ADS/TDD 4154 in FY95. The additional funding impact will not be known until the Pre-conceptual Design Study has been completed.

- o The schedule proposed to NMED called for the first phase of this project to be completed by the end of FY93, and for the full-scale remediation of drums to begin in 1995. However, compliance with the No-Migration variance petition for the Waste Isolation Pilot Plant (WIPP) requires the Laboratory to recover and characterize 1% of the wastes scheduled for shipment to WIPP. This requirement may force the schedule to be accelerated to allow safe retrieval and characterization of some wastes from the pads in accordance with the WIPP compliance schedule. Possibly, either relief from this requirement will need to be sought, or an accelerated schedule (at significantly higher cost) will need to be developed.

Please note that the enclosed Action Plan has been developed into several phases (the presentation outlined a two-phase project). The initial phases place strong emphasis on a comprehensive assessment of the potential hazards and risks associated with current storage conditions, and enhanced monitoring and surveillance as preparations for installation of the dome structures are initiated. This will be accomplished through development and implementation of a detailed Assessment Plan, which also calls for monitoring and surveillance activities which will be continued throughout the life of the project. This Assessment Plan will include the following elements, at a minimum:

- 1) Compilation of historical data on deterioration of TRU drums at facilities throughout the DOE complex;
- 2) Assembly and analysis of all environmental sampling data (for chemical and radioactive constituents) that has been collected within and around Pads 1, 2, and 4 at TA-54, Area G;
- 3) Compilation and review of available waste stream data characterizing wastes in the containers, to categorize the containers' potential for corrosion and target specific containers and storage cells for highest-priority action;

- 4) Development and implementation of monitoring and inspection plans, which may include removal of soil and synthetic covers from selected cells following placement of the dome structures. This would allow visual inspections of top-tier drums, supplemented by visual inspection of lower-tier containers using remote video cameras.

Initial assessment actions described above will be initiated immediately upon NMED approval of this proposed Action Plan. In addition, a project-specific contingency plan will be developed which outlines procedures for addressing potentially hazardous situations if they are encountered during the project. This would include procedures for selective removal of individual containers from the current storage array, if they are identified as deteriorating excessively through a visual inspection, and if the procedure can be accomplished safely. This plan will be consistent with the Laboratory's currently existing contingency and Emergency Action plans.

The draft Assessment Plan, like other elements of the Action Plan, is contingent on NMED approval and assurance of DOE funding support. It is anticipated that a final Assessment Plan would be submitted to NMED within four months of receipt of NMED comments on the enclosed draft Assessment Plan.

If you have any questions about this Action Plan, please call Edward Derr (665-6151) or Juan Corpion (665-0455) of my staff.

Sincerely,

Allen J. Tiedman
Associate Director
for Operations

Encl. a/s

Cy: T. Gunderson, EM-DO, w/enc. MS K491
K. Hargis (EM-8:--), EM-8, w/enc., MS K490
A. Drypolcher, EM-7, w/enc., MS E517
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CRM-4, w/enc., MS A150
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DRAFT
CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Benito Garcia, Chief
Hazardous and Radioactive Materials Bureau
New Mexico Environment Department
Harold Runnels Building
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, New Mexico 87502

Dear Mr. Garcia:

Enclosed is a proposed Action Plan detailing the Department of Energy's (DOE) phased approach for addressing the corrosion problem associated with mixed waste containers at Technical Area 54, Area G at the Los Alamos National Laboratory (LANL). A Task Order authorizing a preconceptual design study for project facilities has been developed which will provide a basis for engineering designs and cost estimates. However, we request your review and concurrence with the proposed approach in order to proceed with preconceptual design work.

Please note that the proposed Action Plan has been developed into several phases (the presentation outlined a two-phase project). The initial phases place strong emphasis on comprehensive assessment of the potential hazards and risks associated with current storage conditions; and enhanced monitoring and surveillance as preparations for installation of the dome structures are initiated. This will be accomplished through development and implementation of a detailed Assessment Plan that calls for monitoring and surveillance activities throughout the life of the project. This Assessment Plan will include the following elements, at a minimum:

- A. Compilation of historical data on deterioration of waste drums at facilities throughout the DOE complex;
- B. Assembly and analysis of all environmental sampling data (for chemical and radioactive constituents) that has been collected within and around Pads 1, 2, and 4 at TA-54, Area G;
- C. Compilation and review of available waste stream data characterizing wastes in the containers to determine container potential for corrosion and target specific containers and storage cells for highest-priority action; and
- D. Development and implementation of monitoring and inspection plans that may include removal of soil and

synthetic covers from selected cells following placement of the dome structures. This would allow visual inspections of top-tier drums, supplemented by visual inspection of lower-tier containers using remote video cameras.

In addition, a project-specific contingency plan will be developed to outline procedures for addressing potentially hazardous situations if they are encountered during the project. This would include procedures for selective removal of individual containers from the current storage array if identified as deteriorating excessively through a visual inspection, and if the procedure can be accomplished safely. This plan will be consistent with existing contingency and emergency response plans.

It is anticipated that a final Assessment Plan would be submitted to NMED within four months of receipt of NMED comments on the enclosed draft Assessment Plan. Likewise, we are prepared to commence work on the initial phase of the enclosed Action Plan, as described, upon your concurrence of the proposed Action Plan.

If you have any questions about this plan, please call Jon Mack of my staff at 665-5026.

Sincerely,

Jerry L. Bellows
Area Manager

Enclosure

cc: M. Bange, WMOSD, AL
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Proposed Actions

Transuranic Waste Storage Pads 1, 2, and 4

TA-54, Area G

Los Alamos National Laboratory

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INTRODUCTION AND SUMMARY

This Action Plan establishes the frameworks for two general activities that will be implemented to ensure safety and to correct the conditions of storing legacy transuranic waste containers on Pads 1, 2, and 4 in Technical Area 54 (TA-54), Area G, at Los Alamos National Laboratory. The first general activity is to develop a detailed draft plan ("Assessment Plan") to assess the current conditions of legacy transuranic waste and to evaluate the level of hazard resulting from these conditions. The second general activity is to define the actions ("Planned Actions") in three phases necessary to retrieve, repackage as necessary, non-destructively test, and place legacy transuranic waste in RCRA-compliant storage facilities. Detailed work plans for each phase will be prepared before beginning the associated specific activities. The eventual treatment and disposal of these wastes are outside the scope of this Action Plan.

Los Alamos National Laboratory currently stores legacy (that is, previously generated beginning in 1971) transuranic waste on Pads 1, 2, and 4 in dense arrays covered with plywood, plastic, and soil. These pads are listed as container storage units in Part A of the RCRA Permit application for mixed waste. A recent investigation and retrieval operation on Pad 2 indicated that some containers show limited surface corrosion and that one container had an apparent pinhole leak, although no detectable radioactive contamination was identified. This operation has also emphasized the lack of inspectability of these container storage units.

The Assessment Plan for the current condition of containers will be initiated to ensure that current storage practices on Pads 1, 2, and 4 do not pose an immediate danger to human health or the environment and to provide information for the design and implementation of container retrieval processes. A detailed draft plan will be developed following approval of the framework for the Assessment Plan. The Assessment Plan will include:

- A compilation and review of historical data on drum deterioration at Los Alamos National Laboratory and other facilities
- A compilation describing the contents of the legacy transuranic waste containers and their locations on the pads
- A review of environmental surveillance results
- An assessment of enhanced surveillance requirements; a description of monitoring equipment planned for structures to be constructed over the pads
- A plan for inspection and observation of selected drums by direct and remote methods following removal of plastic, plywood, and earthen cover over selected cells on these pads after the installation of the structures to cover the pads.

The Planned Actions will result in the retrieving, repackaging as necessary, nondestructively testing, and storing the legacy transuranic waste containers in inspectable arrays within RCRA-compliant storage units. These Planned Actions are grouped into three phases. The first phase involves installing the structures over the pads, which will allow the assessing of the current condition of containers; the second phase involves the engineering design and construction of the facilities to safely retrieve and store the containers and to safely provide RCRA characterization information; and the third phase is

the actual retrieving, sampling, repackaging, nondestructively testing, and storing operations. Detailed descriptions of the facilities, work plans, health and safety plans, community relations plan (if appropriate), and other plans will be developed after completing the initial engineering design in Phase II.

The key elements of these plans are listed below. Additional information on each of these elements is provided in the following sections.

Assessment Plan

- Develop detailed draft Assessment Plan to investigate and evaluate current conditions, contents, and locations of legacy transuranic waste containers retrievably stored on Pads 1, 2, and 4

Planned Actions

Phase I

- Perform engineering design for structures to be installed over Pads 1, 2, and 4; install footers; and purchase structures
- Install structures over Pads 1, 2, and 4 that will provide weather protection and enclosed, monitorable work areas
- Develop monitoring plan and enhanced surveillance plan
- Purchase and install equipment required to implement the Assessment Plan (after its approval), monitoring plan, and enhanced surveillance plan
- After approval of the Assessment Plan, implement the remaining activities defined in the Assessment Plan
- After completion of the appropriate activities defined in the Assessment Plan, provide a detailed evaluation of the hazards associated with the current storage of legacy transuranic waste

Phase II

- Perform engineering design of facilities necessary to safely retrieve, repackage as necessary, and store the legacy TRU waste containers
- Identify and design supporting facilities
- Prepare environmental documentation, including an environmental assessment (NEPA)
- Mitigate adverse impacts to historical sites within the designated area for RCRA-compliant storage facilities
- Install fencing, roadways, and utilities for the designated area for these storage facilities
- Construct new facilities and upgrade existing Drum-Preparation Facility

- Define and develop detailed procedures for retrieving, repackaging, and storing operations
- Prepare safety/hazards analysis for the facilities and operations
- Identify, purchase, and install supporting equipment

Phase III

- Retrieve, sample, repackage as necessary, nondestructively test, and place legacy TRU waste in inspectable arrays within RCRA-compliant storage facilities

Commencement of the activities associated with these elements depends on the approval of the frameworks of this Action Plan by the State of New Mexico Environment Department (NMED) and the Department of Energy (DOE). Delays in the approval of these frameworks will delay the activities; environmental documentation and engineering designs cannot begin until the frameworks are approved. Provided that *minimal* delays occur in the approval process, the detailed draft Assessment Plan will be completed four months after approval of the framework of the Plan; Phase I of the Planned Actions will be completed during fiscal year 93 (FY93); Phase II will be completed during FY95, and Phase III will commence immediately after the completion of Phase II.

BACKGROUND INFORMATION

Los Alamos National Laboratory stores transuranic waste at TA-54, Area G, in units and facilities that allow for waste retrieval. Some of this waste is stored in facilities identified as container storage units in Part A of RCRA Permit Application for mixed waste. However, TRU waste historically has been stored in some of these units such that inspection is not feasible because of the physical arrangement of the containers and the earthen covers over these units. Recently, the cover over a portion of one of these units was removed, and limited deterioration was observed on some of the containers.

Storage of Legacy Transuranic Waste at Los Alamos National Laboratory

Retrievable storage transuranic (TRU) waste at Los Alamos National Laboratory at TA-54, Area G, began in 1971. TRU waste is waste that contains alpha-emitting radionuclides with half-lives greater than 20 years at concentrations greater than 100 nanocuries per gram (nCi/g). TRU waste can be classified into two general categories: newly generated and legacy.

DOE Order 5820.2A requires that all newly generated TRU waste be generated in accordance with an approved attachment to the TRU Waste Certification Plan. Since about 1987, newly generated, certifiable TRU waste has been stored in self-supporting fabric tension structures (domes) in inspectable arrays. However, during this same period, the Waste Management Group (EM-7) at Los Alamos National Laboratory has accepted under special circumstances small volumes of newly generated, non-certifiable TRU wastes for storage.

Approximately 7400 m³ (about 33,000 55-gallon drum equivalents) of legacy TRU waste is stored at TA-54, Area G, in trenches, shafts, one pit and on three pads. The pads (Pads 1, 2, and 4) are listed in the Part A of the RCRA Permit application for mixed

waste as container storage units; this Action Plan addresses only the containers on Pads 1, 2, and 4 (approximately 16,700 drums* and 220 fiberglass-reinforced polyester [FRP] crates). The remaining legacy TRU waste will be retrieved and remediated as part of the TRU Waste Work-Off Plan and will be regulated under the Hazardous and Solid Waste Amendments Act (HSWA).

The legacy TRU waste packages on Pads 1, 2, and 4 are stored above grade, under plywood, plastic, and earthen covers. The location of these pads within TA-54, Area G, is shown in Figure 1. These containers are stored in a dense array without any space between the packages, with drums in the middle and with FRP crates along the edges (to the extent possible). The drums are stacked four high with a layer of plywood between each layer. The generic composition of legacy TRU wastes is shown in Figure 2.

Pads 1, 2, and 4 were identified as mixed waste container storage units in Part A of the RCRA Permit application for mixed waste. Table I is a summary of the number of legacy TRU packages on each of these storage pads.

Table I. Legacy TRU Packages in Storage on Pads 1, 2, and 4.

Location	Package Type	Quantity	Period of Active Use
Pad 1	55-gal drums	4777*	5/29/79 to 5/13/86
	83-gal drums	10	
	99-gal drums	3	
	FRP crates	116	
Pad 2	55-gal drums	7295	12/8/81 to 8/20/85
	80-gal drums	1	
	FRP crates	48	
Pad 4	55-gal drums	4556	3/18/85 to 1/3/91
	80-gal drums	7	
	83-gal drums	2	
	85-gal drums	1	
	FRP crates	54	

* Data corrected 5/26/92, previously reported as 7295 drums

Current Status

On March 16, 1992, personnel from the RadWaste Section EM-7 began retrieving 14 drums from a specific waste stream at the request of the waste generator. The generator requested the retrieval of drums from this waste stream to investigate the long-term stability of the waste form. Approximately one year elapsed between the initial request and the commencement of the process because planning, identifying specific drums to be retrieved, and developing the health and safety plan.

The retrieval process involved removing the earthen cover over the cell within Pad 2 that enclosed the selected drums, opening the plastic liner, and removing the plywood cover above the portion of the cell containing these drums. When the cell was penetrated, continuous monitoring for airborne radioactive material was done; no detectable levels of radionuclides were measured.

FIGURE 1

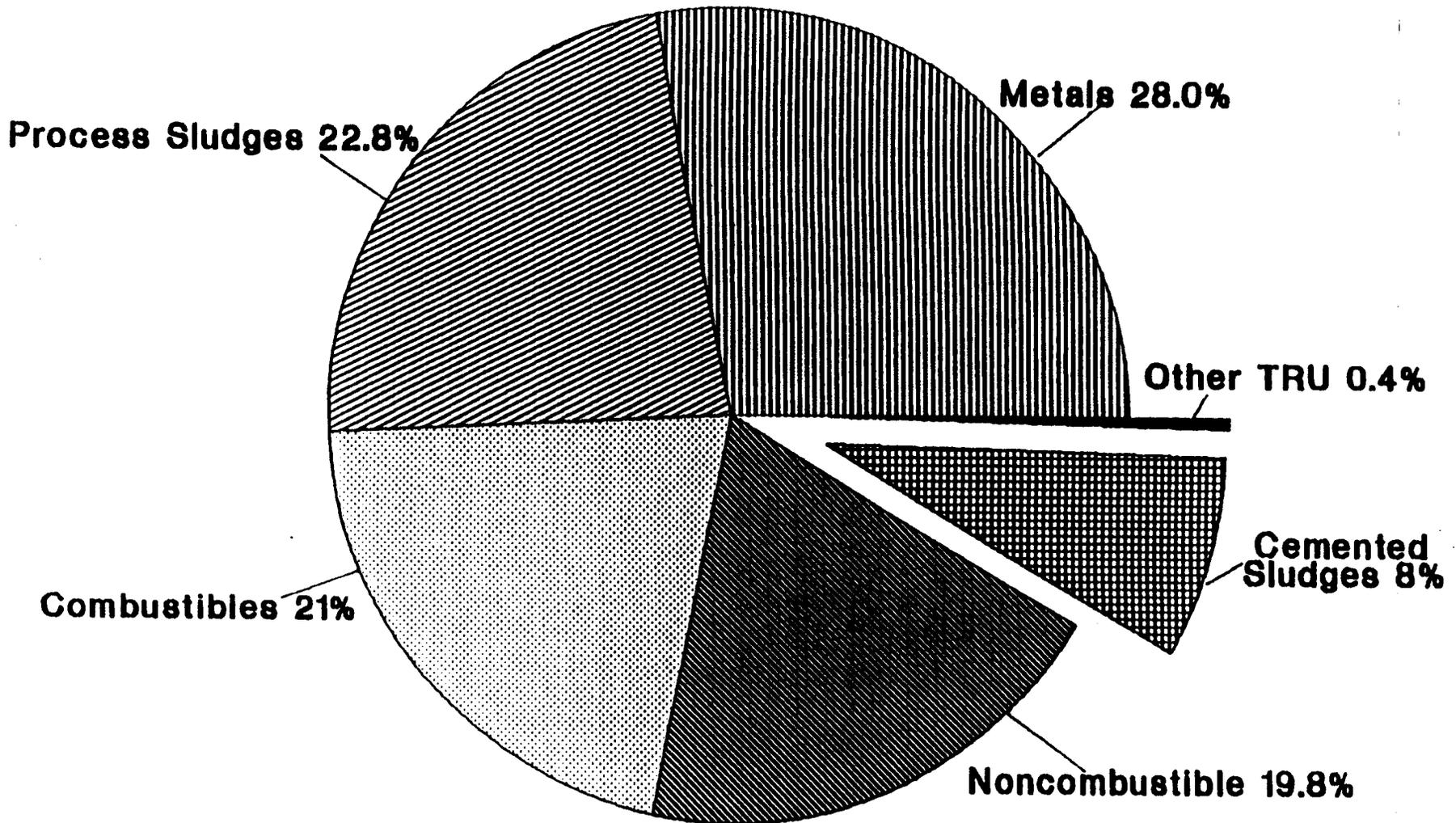
TA-54, AREA C
PAD STORAGE (1, 2, 4)

 PAD STORAGE (1, 2, 4)



Figure 2

UNCERTIFIABLE TRU IN STORAGE



Visual examination of the drums near the opening identified several drums on the perimeter of the cell with evidence of deterioration, such as limited surface corrosion and flaking paint- or rust-preventative emulsion. Drums near the center of the cell did not exhibit any deterioration. One drum had an apparent pinhole leak that was internally formed. This apparent pinhole leak was identified by a visible stain on the surface of the drum; a radioactive contamination survey indicated no detectable contamination on the surface of this drum. Other occurrences of pinhole leaks with this waste form (cemented sludge from TA-50) have been noted in drums stored in a dome but have not released any radioactive material.

The 14 drums requested by the waste generator were retrieved; these drums were located in the top two layers of the cell. The drum with the apparent pinhole leak and another easily accessible drum containing the same waste stream, were retrieved. The opening in the earthen mound is presently covered with a tarp for weather protection.

FRAMEWORK FOR THE ASSESSMENT PLAN

The Assessment Plan for the current conditions of legacy TRU waste containers stored on Pads 1, 2, and 4 provides the information and data necessary to evaluate the hazards and existing environmental impacts of the current storage arrays. This information and data also will be used to design and operate the container retrieval process. A detailed draft Assessment Plan will be developed and submitted for approval *within four months* of the approval of this framework by NMED and DOE.

The Assessment Plan will require the following:

- Compiling and reviewing historical data on drum deterioration at Los Alamos National Laboratory and other facilities; this information will be used to establish the expected levels of deterioration of the containers currently stored on Pads 1, 2, and 4
- Compiling available information about the radioactive and hazardous waste components in the containers currently in storage to determine monitoring and surveillance goals
- Compiling locations of the containers within the pads, including categorization by waste streams
- The results of current environmental surveillance programs will be compiled as a basis for the enhanced surveillance program

The initial activities of the Assessment Plan (for example, the compiling of data) will commence with the approval of the framework of the Plan and will be done concurrently with the development of the detailed draft of the Plan.

After installing the structures over Pads 1, 2, and 4, as specified in Phase I of the Planned Actions, the Assessment Plan will require installing monitoring equipment for radioactive and hazardous waste components. The Assessment Plan also will consider approaches for determining whether the results of the monitoring indicate releases from the containers or normal off-gassing of the soil under the pads and/or the containers.

Also following the installation of the structures to provide enclosed work areas, the plastic,

plywood, and earthen cover will be removed from selected cells to allow investigation of the condition of specified containers. These containers will be determined from the compilation of the data on the contents of containers in the first part of the Assessment Plan. The condition of the specified containers will be investigated using direct observation and inspection and using remote inspection technologies such as a fiber-optic camera. The results of the inspections will be recorded either by photographs or by taping the output from the fiber-optic camera. The Assessment Plan will incorporate a contingency plan to be implemented if significantly deteriorated containers are identified; this contingency plan will include guidance for assessing the safety of any actions to address the condition of those containers and the decision criteria for selecting the appropriate actions.

FRAMEWORK FOR THE PLANNED ACTIONS

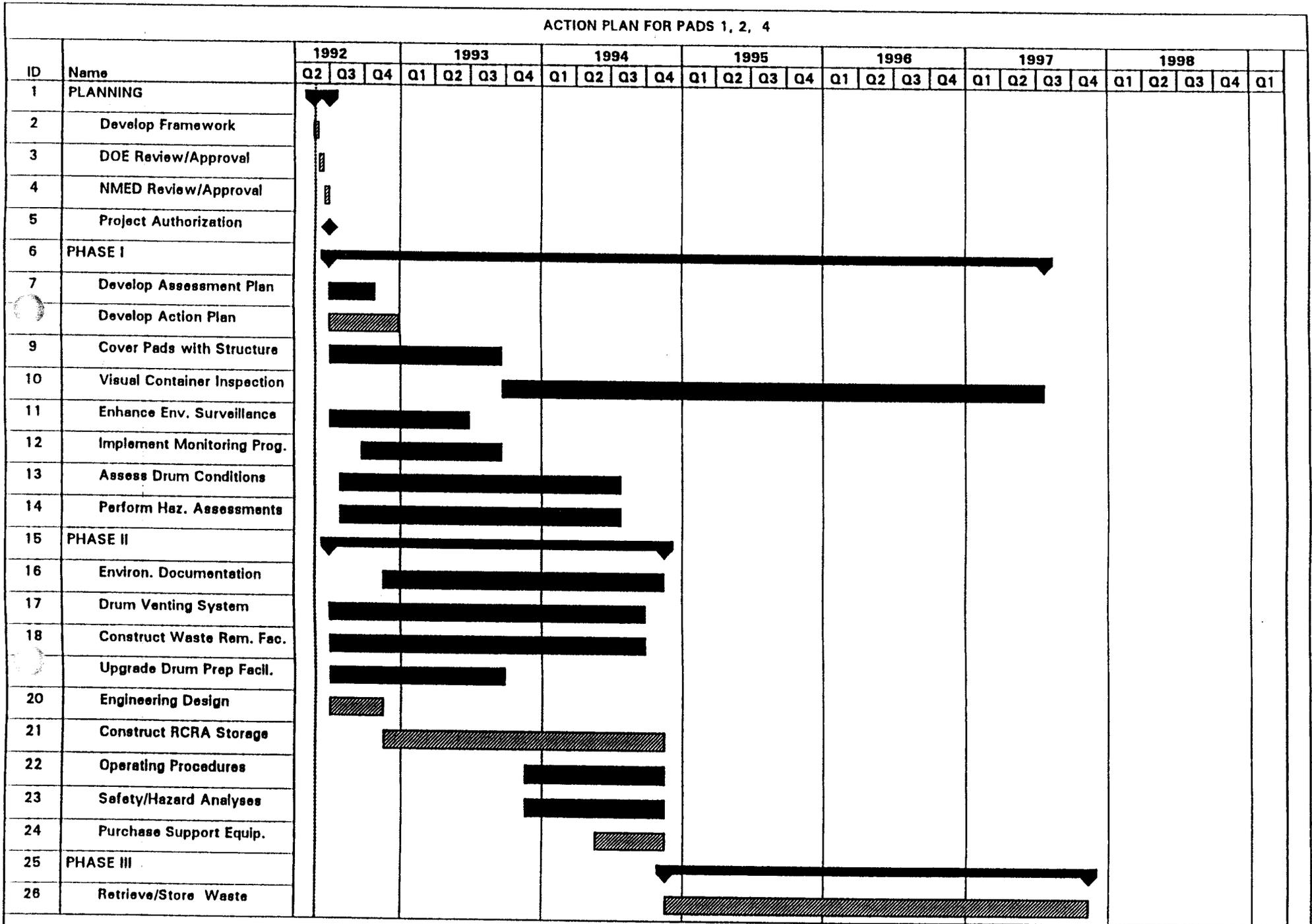
The Planned Actions will result in the retrieval of waste containers from Pads 1, 2, and 4, which will be vented and transported to the appropriate facility for repackaging, if necessary, and for storage in an inspectional array within a RCRA-compliant storage facility. However, appropriate facilities and RCRA-compliant storage structures, along with safety plans, procedures, and environmental documentation, must be available to *safely* retrieve and repackage, as necessary, TRU wastes, and to properly store the packages in inspectional arrays.

To accomplish this objective, the Planned Actions are divided into three phases; these phases will, to some extent, occur concurrently with each other and with the Assessment Plan. These phases are summarized below and detailed in the following sections. The activities in these phases will commence after approval by the NMED and the DOE of the framework of the Planned Actions as indicated in this and the subsequent sections. Assuming that minimal delays occur in the approval process, the projected schedule for the major activities is shown in Figure 3.

The first phase involves enclosing the pads within self-supporting fabric tension structures to provide additional weather protection for the waste containers and to provide enclosed work areas for assessing current condition of containers. Included in Phase I are the implementation of enhanced environmental surveillance and monitoring within the domes. After approval, the Assessment Plan for the current condition of containers will be implemented as part of Phase I.

Phase II, which will be initiated concurrently with Phase I and the development of the Assessment Plan, covers the design and construction of facilities necessary to retrieve, sample, repackage, and store the containers currently on Pads 1, 2, and 4. The engineering design of the facilities, including detailed conceptual design and the related operations, will be included in Phase II. An environmental assessment and other environmental documentation, along with a safety/hazards assessment, for the appropriate Planned Actions also will be developed in Phase II. Details on the facilities and procedures will be defined during the engineering design stages.

Figure 3



Project: LANL ACTION PLAN
Date: 5/21/92

Critical  Progress  Summary 
 Noncritical  Milestone 

Phase II activities will define and construct the necessary facilities, with supporting documentation and procedures, to begin Phase III: retrieving, sampling, repackaging as necessary, nondestructively testing, and storing the containers in inspectable arrays within RCRA-compliant storage facilities. The facilities required to safely retrieve the legacy TRU waste include drum-venting system, a drum-preparation facility, a waste remediation facility, RCRA-compliant storage facilities, and other general support facilities. The operation of the nondestructive testing facility will also be necessary to ensure the safety of the storage operations by allowing x-ray examination of drum contents and assessment of the fissile content of the waste within each drum.

PHASE I OF THE PLANNED ACTIONS

Phase I involves installing structures over Pads 1, 2, and 4. These structures will provide additional weather protection for the waste containers and to provide an enclosed work area for activities specified in the Assessment Plan and for future retrieval operations. The structures also will allow installation of monitoring equipment to evaluate the existence and magnitude of potential releases of radioactive and hazardous waste components from the legacy TRU containers. At this time, the structures are expected to be fabric domes; however, the engineering design for the footers may require the construction of a different type of enclosure. Commencing Phase I depends on the approval of the framework for the action plan.

Along with design, purchase, and installation of structures over Pads 1, 2, and 4, Phase I activities will support the Assessment Plan. Phase I will involve purchasing and installing equipment required by the Assessment Plan and will involve, after installation of the structures and approval of the Assessment Plan, implementing the activities identified in the Assessment Plan. After completion of the appropriate activities defined in the Assessment Plan, the hazards associated with the current storage of legacy TRU waste will be evaluated. Phase I also will involve implementing the monitoring and enhanced surveillance plans, and purchasing and installing required equipment.

PHASE II OF THE PLANNED ACTIONS

Phase II involves the engineering design and construction of the facilities to safely retrieve and store the legacy TRU waste containers. The initial aspects of Phase II will occur concurrently with the Assessment Plan and Phase I. Phase II activities will commence shortly after the approval of the framework for this plan. Provided that minimal delays occur during the approval process, Phase II will begin in FY92 and completed during FY95.

Concurrently with the Phase I activities and the engineering design of the required facilities, Phase II of the Planned Actions will evaluate the hazards and environmental impacts of the planned retrieval of the legacy TRU waste packages. The program will evaluate technologies, retrieval strategies, and schedules of proposed facilities and processes and will develop the operational requirements, including the detailed work plan, the health and safety plan, and the detailed operating procedures.

Phase II will begin with the detailed preliminary design ("conceptual design") of the facilities, incorporating consideration of and constraints from the safety requirements for

the operations and identifying all required facilities. Currently projected facilities are described below. After completion of the preliminary design, the additional engineering design activities will commence and the environmental assessment and other environmental documentation will be prepared based on the preliminary design.

Environmental documentation *must* be completed and approved before continuing Phase II activities. After the approval of the environmental documentation, any adverse impacts to historical sites in the designated area for the RCRA-compliant storage facilities will be mitigated in accordance with the environmental documentation. Fencing, roadways, and utilities will be installed as necessary in this area. Final engineering design activities will be completed.

Following completion of the engineering design, new facilities will be constructed, and existing facilities will be upgraded. In conjunction with the construction, detailed procedures for retrieving, repackaging, and storing operations will be developed, with emphasis on the safety of the operations. Furthermore, a safety/hazards analysis for the facilities and operations will also be prepared. As part of the engineering design and the development of the procedures, supporting equipment will be identified and requisitioned.

A parallel activity that is planned to occur concurrently with Phase II is the characterization of legacy TRU wastes in support of the WIPP no-migration variance petition. This activity is planned to begin during FY94. Approximately 1% of the legacy TRU waste will be retrieved and characterized for volatile organic compounds, flammable gases, metals, and semi-volatile organic compounds. The selection of containers to be retrieved and characterized will be based on the results of the Assessment Plan and will consider the safety of the retrieval and characterization operations as a primary constraint. After the examination, this waste will be stored in one of the domes for newly generated TRU waste. The rest of the legacy wastes on Pads 1, 2, and 4 will be stored until completion of this Action Plan.

Drum-Venting System

When TRU waste packages are retrieved from earthen storage, a safety requirement is to remotely vent each drum that may contain elevated or explosive levels of volatile organic compounds (VOCs) from the waste constituents and/or hydrogen gas resulting from the radiolysis of organic materials within the waste. During the venting process, the headspace will be sampled for explosive gases and RCRA-regulated components. Safe storage of waste containers implies preventing a future build-up of hydrogen gas; therefore, a high-efficiency particulate air (HEPA) filter must be installed in the vent opening.

This drum-venting system will provide a safe, engineered system for these operations. Eventually, all legacy TRU waste containers will be vented; however, this operation will be staged to ensure that high-risk containers (for example, those with organic and radioactive contents that may cause the build-up of hydrogen gas and VOCs) will be vented during the retrieval process and that low-risk containers will be vented as the drum-venting system is available.

Drum-Preparation Facility

Because legacy TRU waste packages were coated with a rust-inhibitive emulsion and because the packages may have deteriorated significantly without any external indication, containers will be processed through the drum-preparation facility. This facility will provide an area in which to steam-clean the drums and ultrasonically examine the thickness of the

drum walls. Eventually all containers will be cleaned and ultrasonically tested; however, containers in good condition with waste forms initially exhibiting a low risk of internal corrosion may be placed directly in the RCRA-compliant storage facilities to allow optimum usage of the drum-preparation facility. Although this facility currently exists, the facility must be upgraded and a covered decontamination pad for equipment and vehicles must be added to meet current requirements.

Waste Remediation Facility

The Laboratory is currently designing the waste remediation facility to remediate any deteriorated packages of legacy TRU waste. Because some TRU waste packages constructed of FRP lost integrity in 1987 and because prolonged storage of wastes (since 1971) is expected to cause continuing deterioration of packages, a facility is required to safely process any deteriorated packages.

This facility will provide a work area with HEPA filters and a liquid collection system to allow damaged containers of TRU waste to be opened, sampled, repackaged, and prepared for placement into a RCRA-compliant storage facility. Damaged drums also may be overpacked in the facility. The facility design is expected to enter final design during mid FY93. The draft environmental assessment is scheduled to be initiated during FY92, provided the framework of this Action Plan is approved. The draft preliminary safety analysis report is scheduled to be initiated in FY93.

Other Facilities and Equipment

Additional facilities, such as access control, offices, and rest rooms/change rooms, will be identified during the engineering design aspects of Phase II. Equipment such as a HEPA-filtered work enclosure for retrieval operations, earth-removal vacuum, analytical equipment, and overpacks will be identified and purchased during Phase II.

PHASE III OF THE PLANNED ACTIONS

Phase III involves the actual retrieving, sampling, repackaging as necessary, nondestructively testing, and storing of the legacy TRU waste in inspectable arrays within RCRA-compliant storage buildings. The details of this phase will be defined by the results of the assessment of the current condition of containers, the engineering design of the facilities and supporting operations, and the results of the environmental assessment, other environmental documentation, and the safety/hazards assessment and will be documented in the work plan for this phase.

Phase III operations will begin with the retrieval of containers from storage on a selected pad; the selection will be made based on the results of the Assessment Plan and will consider the condition of the containers, the hazard level associated with continued storage, and the safety of the retrieval operation. Each container will be processed after the initial retrieval operation based on the condition of the container, the contents of the container, and the anticipated conditions within the container itself. A flow-chart illustrating the processing of the containers is shown in Figure 4.

Containers exhibiting no corrosion and containing waste forms that present no handling or storage hazards will be retrieved from storage, inspected, and placed in inspectable arrays within RCRA-compliant storage facilities. Later these containers will be vented, steam-

cleaned, ultrasonically tested, sampled, nondestructively tested, repackaged if necessary, and returned to storage in a RCRA-compliant storage facility. These processes will be delayed to enable immediate processing of more critical containers as soon as possible.

Containers exhibiting significant corrosion will be overpacked and transported to the Waste remediation Facility to be repackaged into vented containers. As appropriate, sampling and nondestructive testing of the waste containers will be conducted. The new waste containers will be placed in inspectable arrays within RCRA-compliant storage facilities.

Containers that do not exhibit significant corrosion but that contain waste forms that present handling or storage hazards (for example, potential hydrogen gas build-up) will be vented as close as possible to the retrieval location. This arrangement will minimize handling of the containers before venting. During the venting operation, a sample of the headspace gas will be collected and analyzed to provide RCRA characterization information. After venting and aspirating, the containers will be transported to the drum-preparation facility for steam cleaning and ultrasonic testing. If the containers demonstrate adequate integrity for storage, the containers will be nondestructively tested and placed in RCRA-compliant storage facilities. Containers that do not exhibit adequate integrity for storage will be transported to the waste remediation facility for repackaging before placement into storage.

At the completion of Phase III, all containers currently stored on Pads 1, 2, and 4 will be safely packaged, will have additional characterization, and will be stored safely in inspectable arrays within RCRA-compliant storage facilities.

Figure 4

Phase III Flow-Chart

