



GARY E. JOHNSON  
GOVERNOR

*State of New Mexico*  
**ENVIRONMENT DEPARTMENT**  
*Hazardous & Radioactive Materials Bureau*  
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(505) 827-1557  
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*Blue file LANL TA 54*



PETER MAGGIORE  
SECRETARY

PAUL R. RITZMA  
DEPUTY SECRETARY

May 2, 2000

Gilbert Montoya  
Los Alamos National Laboratory  
P.O. Box 1663, MS J595  
Los Alamos, NM 87545

Dear Mr. Montoya:

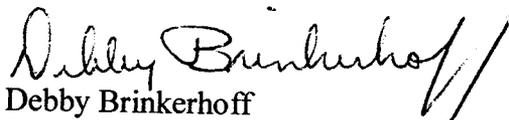
Enclosed is the signed Remedial Action Plan, Attachment B to the Consent Agreement for Compliance Orders NMHWA 93-01, 93-02, 93-03 and 93-04.

From this document NMED understands that both Pad 1 and Pad 4 have been remediated. Pad 2 has had preparation work begun, but the remediation will not start until this document is signed.

NMED applauds LANL's ability to expedite the work being done at TA-54 and we look forward to having the remediation project completed in advance of the original 2003 time frame.

Should you wish to discuss this document, please contact me at 505-827-1508.

Sincerely,

  
Debby Brinkerhoff  
Compliance and Technical Assistance

Cc: James Bearzi, Chief, HRMB  
John Kieling, Program Manager, HRMB



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**Attachment B**

**Remedial Action Plan - 2000**

This Remedial Action Plan amends the Revised Remedial Action Plan, Attachment B to the Consent Agreement entered into by the Regents of the University of California, the United States Department of Energy and the New Mexico Environment Department (the "Parties"), and approved by the Secretary of the New Mexico Environment Department by way of the Final Order dated December 10, 1993 ("Consent Agreement"). The Consent Agreement sets forth the agreement of the Parties resolving all matters related to New Mexico Hazardous Waste Act Compliance Orders 93-01, 93-02, 93-03 and 93-04.

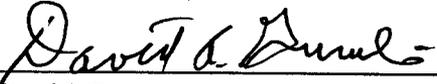
In accordance with the terms of Section XXI of the Consent Agreement, the Parties hereby express their consent to and approval of Remedial Action Plan-2000 as Attachment B to the Consent Agreement.

In accordance with the terms of Section XXI of the Consent Agreement, the Secretary of the New Mexico Environment Department hereby expresses his consent to and approval of Remedial Action Plan-2000, as Attachment B to the Consent Agreement, by signing in the designated space provided below, and hereby declares that the date of his signing shall be the effective date of such substitution.

20 **APPROVED:**

21   
22 Dennis J. Erickson  
23 Division Director  
24 Environment, Safety and Health Division  
25 Los Alamos National Laboratory

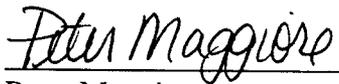
1/24/2000  
DATE

26   
27 David Gurulé  
28 Area Manager  
29 Los Alamos Area Office  
30 U.S. Department of Energy

1/31/2000  
DATE

31   
32 Greg Lewis  
33 Director  
34 Water and Waste Management Division  
35 New Mexico Environment Department

4/18/00  
DATE

36   
37 Peter Maggiore  
38 Secretary  
39 New Mexico Environment Department

5/1/00  
DATE

40 **Introduction<sup>1</sup>**

41 The following sections present listed actions and a phased plan necessary to retrieve transuranic  
42 (TRU) radioactive waste and TRU mixed waste from TRU Pads 1, 2, and 4 and to place these  
43 wastes into inspectable storage. The Transuranic Waste Inspectable Storage Project (TWISP)  
44 Safety Analysis Report (SAR) was used as the safety-basis documentation for the remediation of  
45 Pads 1 and 4. Pad 1 retrieval operations were performed with a retrieval dome in place, whereas  
46 Pad 4 operations did not include a retrieval dome. Due in part to these changes, the SAR has  
47 become out of date. Based on this and the limited life of the project, the Department of Energy  
48 (DOE) has directed TWISP to develop a Basis for Interim Operations (BIO) for Pad 2 retrieval  
49 operations. The BIO will contain all relevant information in the SAR and will supercede the  
50 SAR. This BIO will be approved by the DOE and a Readiness Assessment will be performed to  
51 ensure operations can be conducted safely. Changes to the BIO are accomplished using the  
52 established DOE Order 5480.21, "Unreviewed Safety Question Determination (USQD)  
53 Program." All proposed changes to TWISP operational procedures/processes are reviewed in  
54 accordance with the requirements of the USQD Program. In the event that changes to operations  
55 or the BIO affect the requirements in this Remedial Action Plan (RAP-2000), the USQD  
56 Program will be the change mechanism utilized, and the interim method of documentation, for  
57 the RAP-2000.

58 The USQD Program is designed to allow the TWISP to make limited changes to the content of  
59 the BIO thus allowing flexibility in day-to-day operations. The USQD program requires TWISP

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<sup>1</sup> Remedial Action Plan-2000 does not supercede the requirements for safety established in the Transuranic Waste Inspectable Storage Project's "Basis of Interim Operation" or the "Technical Safety Requirements."

60 management to formally review all BIO changes (operational, design, etc.) prior to  
61 implementation. The changes are reviewed against the following criteria:

- 62 • Could the change increase the probability of an accident?
- 63 • Could the change increase the consequences of an accident?
- 64 • Could the change increase the probability of failure of equipment important to safety?
- 65 • Could the change increase the consequences of failure of equipment important to safety?
- 66 • Could the change create a new failure mechanism of equipment important to safety?
- 67 • Could the change create a new accident type?
- 68 • Will the change reduce the margin of safety?

69 If any of these questions are answered in the affirmative, the TWISP must justify how controls  
70 will be in place to minimize the risk associated with the change. Additionally, DOE must  
71 approve the change. The USQD Program cannot be used to change the project deliverables as  
72 specified in Attachment C. All USQs affecting the TWISP that are finally approved by DOE and  
73 the University of California shall be incorporated during an annual review cycle, and provided to  
74 NMED on or before March 1 of the year following the change. Changes to this plan may be  
75 made to ensure:

- 76 • Worker and public safety
- 77 • Protection of the environment
- 78 • Retrieval of waste by the most safe and effective method
- 79 • Compliance with State requirements

Listed Actions

- 80
- 81 *Completed Actions*
- 82 1. Established a site-specific environmental surveillance program.
- 83 2. Installed high-volume air samplers.
- 84 3. Prepared and completed ES&H documentation, as necessary.
- 85 4. Procured Special Equipment for Retrieval and Storage operations.
- 86 5. Prepared Preliminary Safety Analysis Report.
- 87 6. Prepared and obtained approval of the TWISP Final Safety Analysis Report.
- 88 7. Completed Design Upgrades to existing Drum Prep Facility.
- 89 8. Completed Final Design for TRU Waste Retrieval Dome Project<sup>1</sup>.
- 90 9. Completed Final Design for TRU Waste Temporary Storage Dome Project<sup>1</sup>.
- 91 10. Completed Design of Drum Vent System.
- 92 11. Prepared and obtained approval of Detailed Operating Procedures.
- 93 12. Fabricated and Tested Drum Vent System.
- 94 13. Procured Contractor.
- 95 14. Completed Construction of Retrieval Dome over Pad 1; Completed Construction of Storage
- 96 Domes for Pad 1 waste.
- 97 15. Completed Personnel Training/Operational Readiness Review.
- 98 16. Completed Construction of Storage Domes for Pad 4 waste.
- 99 17. Completed Retrieval Operations in August, 1998, at Pad 1.
- 100 18. Completed Retrieval Operations in December, 1999, at Pad 4.

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<sup>1</sup> The retrieval of waste from TRU Pads 1, 2, and 4 is divided up into two projects - the TRU Waste Retrieval Project and TRU Waste Temporary Storage Dome Project.

101 *Actions to be Completed*

102 1. Complete Retrieval Operations on Pad 2.

103 2. Complete Salvage of Retrieval Equipment.

104 **The Retrieval Operation**

105 **A. Construction and Retrieval Phasing**

106 The retrieval of waste from TRU Pads 1, 2, and 4 is organized into four construction phases.

107 After each of the first three construction phases, waste is retrieved from TRU Pads 1, 4, and 2,

108 respectively. The fourth construction phase is necessary to salvage equipment. Each

109 construction phase is divided up into two separate projects: the Retrieval Project and the Storage

110 Dome Project.

111 Project site activities began with Construction Phases I-R and I-S (-R refers to the

112 Retrieval Project and -S refers to the Storage Dome Project). Construction Phases 1-S (Figure 1),

113 1-R (Figure 2), 2-S (Figure 3), and 2-R (Figure 4) have been completed.

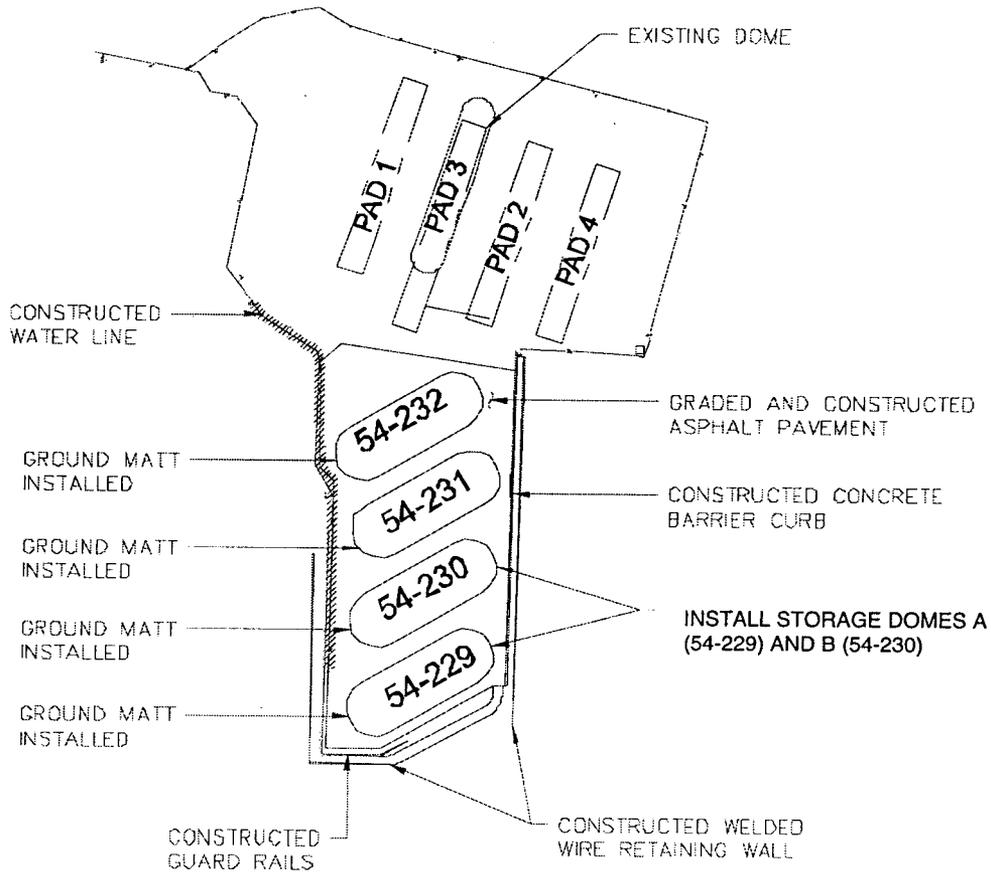


Figure 1. Construction Phase I-S



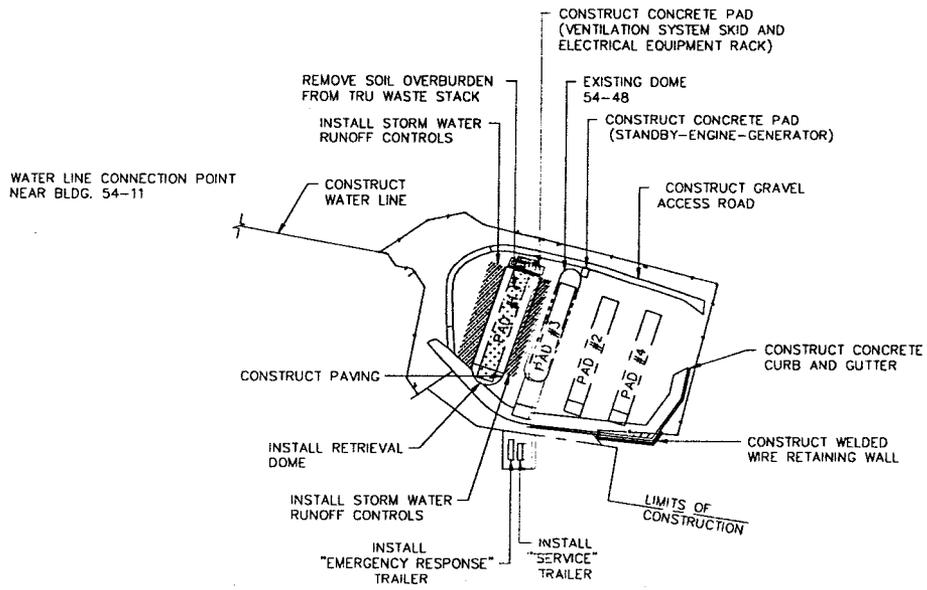


Figure 2. Construction Phase I-R



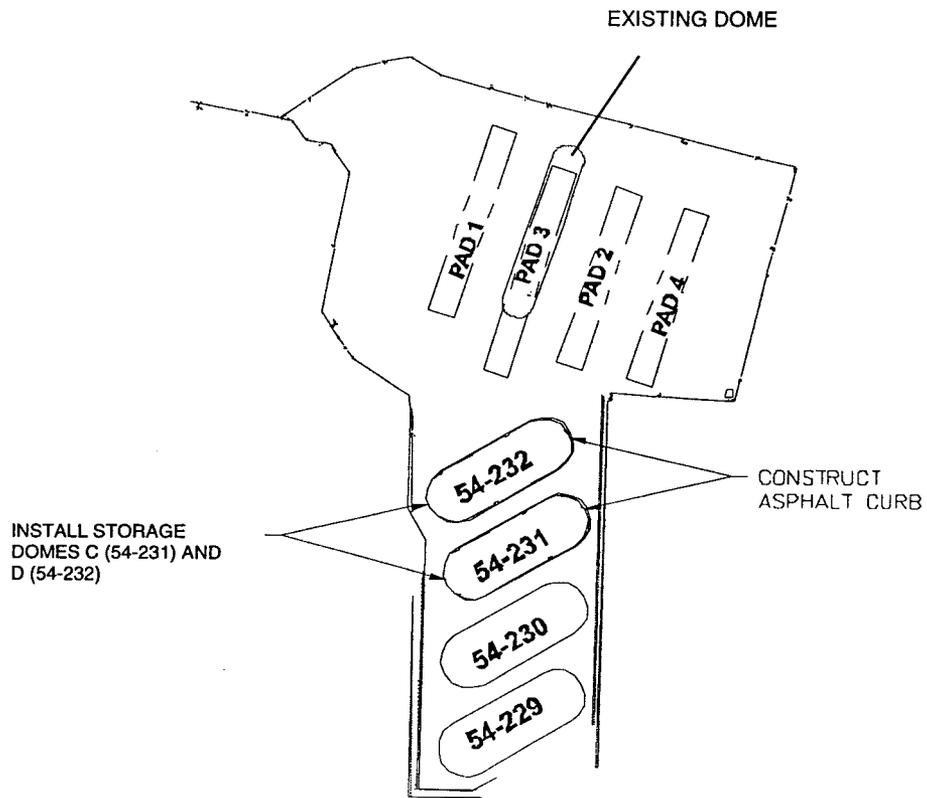


Figure 3 Construction Phase II-S



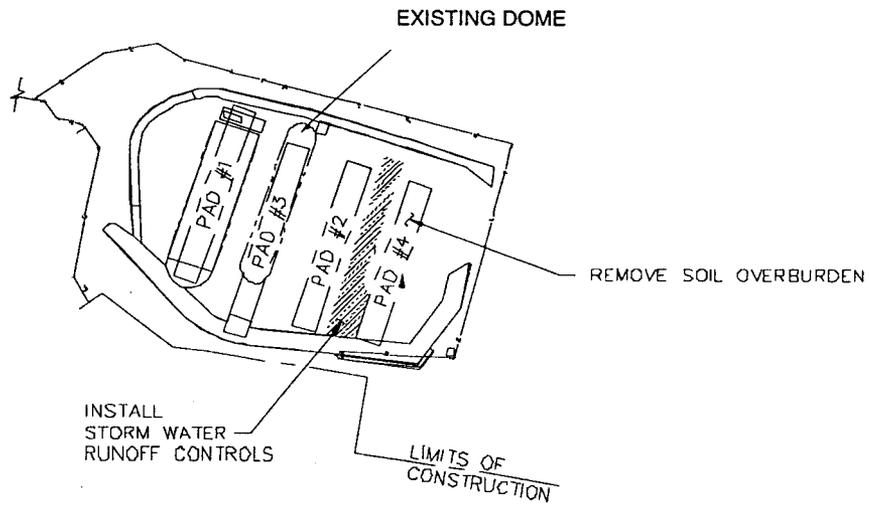


Figure 4. Construction Phase II-R



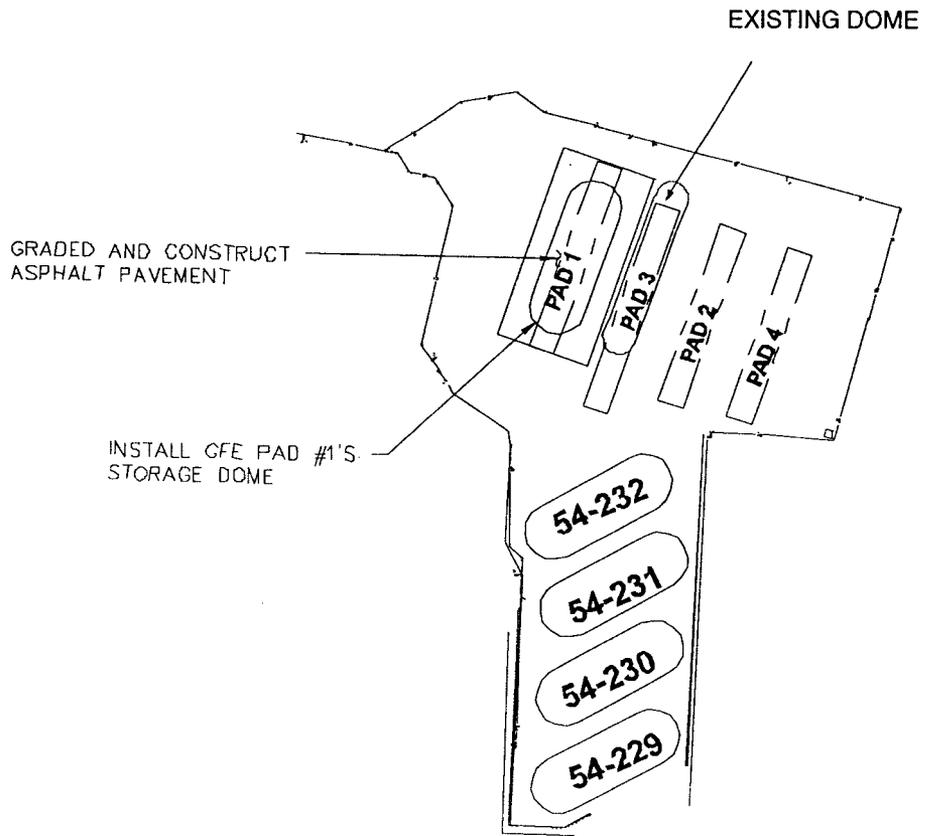


Figure 5. Construction Phase III-S



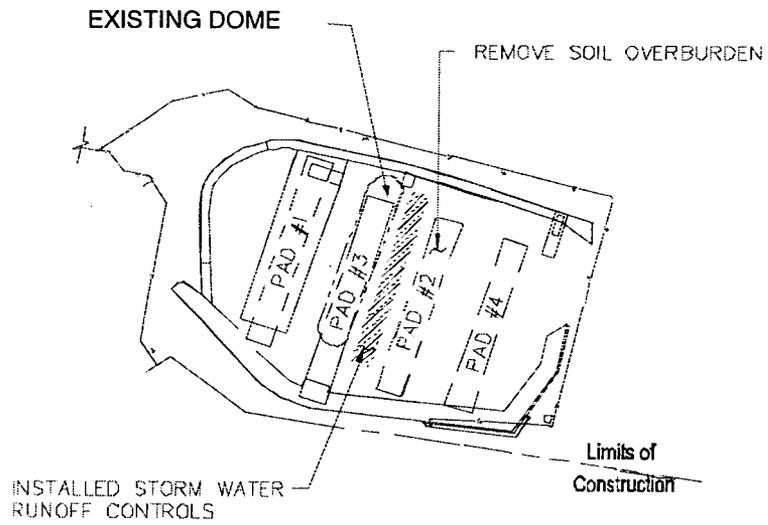


Figure 6. Construction Phase II-R



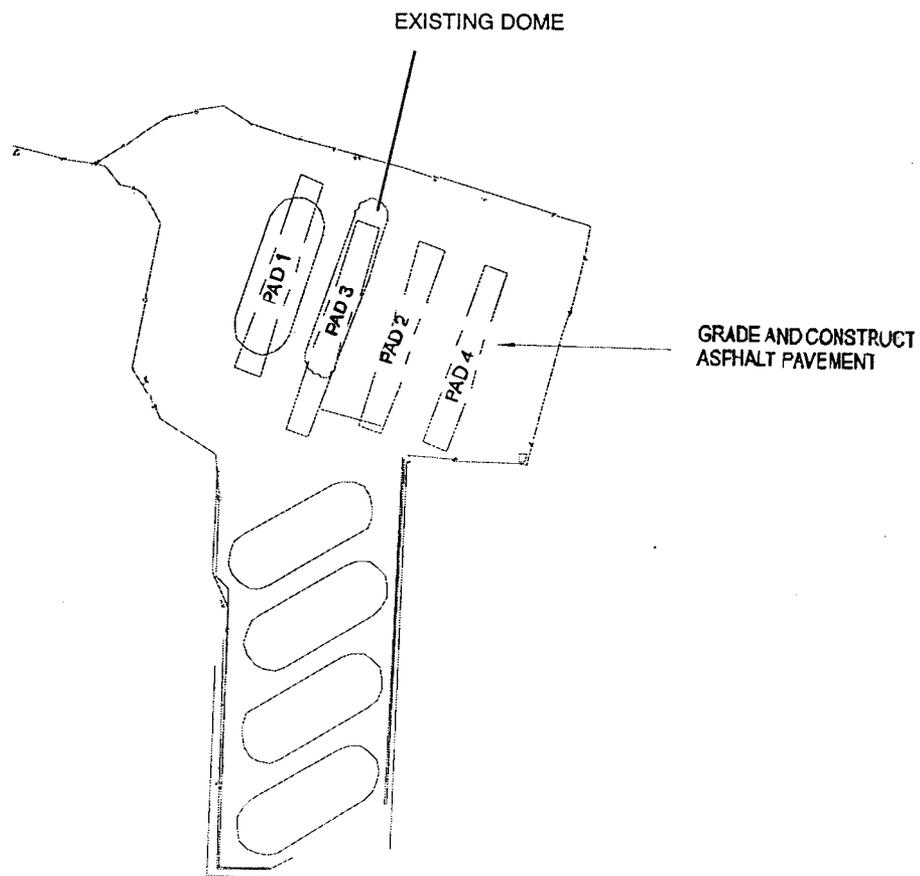


Figure 7. Construction Phase IV-S



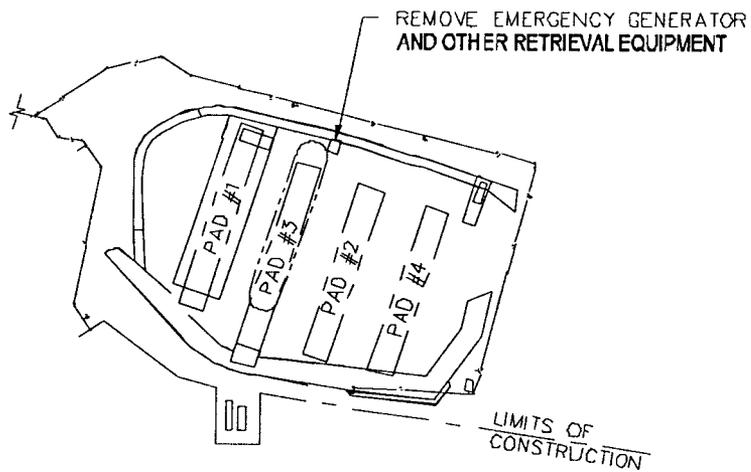


Figure 8. Construction Phase IV-R



122 **B. Detailed Description**

123 **1. Storage Domes**

124 Construction Phases I-S and II-S have been completed. Storage domes 54-229, -230, -231, and  
125 54-232 are being used for storage of retrieved waste. The existing retrieval dome over Pad 1  
126 remains in place for storage and other management activities. The use of a storage dome at Pad 4  
127 is not anticipated at this time.

128 **2. Retrieval Dome**

129 Construction Phase I-R has been completed. The existing retrieval dome over Pad 1 remains in  
130 place for storage and other management activities. A retrieval dome was not used on Pad 4 and  
131 is not planned for use on Pad 2.

132

133 **3. Retrieval from Pad 4 and Pad 2**

134 Construction Phase II-R—for retrieval of Pad 4 waste—was completed. Construction Phase II-R  
135 included preparatory site work at Pad 4, equipment relocation as needed, and installation of  
136 stormwater runoff controls.

137 Pad 4 retrieval operations were completed in December 1999. Mobile enclosures constructed of  
138 fabric or plastic were available for use if potentially damaged drums and/or boxes had been  
139 encountered during Pad 4 retrieval. Portable high-efficiency particulate air (HEPA) filter  
140 systems were available during retrieval operations but were not needed. Monitoring  
141 requirements were determined and routinely evaluated to ensure that monitoring was adequate  
142 for retrieval operations. Electrical service for equipment, in addition to grounding and lightning

143 protection systems, were provided in accordance with applicable requirements.  
144 Analytical data or real-time monitoring for contamination was used to segregate the tuff coming  
145 off the pads. Clean tuff removed from the pad was stockpiled for future use. Contaminated tuff  
146 was associated only with breached containers.  
147 Construction Phase III-R—for retrieval of Pad 2 waste—has begun. This phase includes  
148 preparatory site work around Pad 2 including installation of stormwater runoff controls and  
149 equipment relocation as needed. Because a retrieval dome will not be used at Pad 2, the  
150 protective measures identified as potentially useful for Pad 4 will be available for use at Pad 2.  
151 Finally, after retrieval operations are finished on Pad 2, Construction Phase IV-R will ensure that  
152 all equipment is either salvaged or disposed of as appropriate.

#### 153 4. Pad 2 Cover Removal

154 The tuff cover will be removed with various pieces of earth moving equipment and hand loading  
155 if needed. Retrieval operations at Pad 2 will begin by removing the tuff across the front of the  
156 stack. In order to protect the waste containers prior to their removal and to maintain the stability  
157 of the stack, the tuff cover will be removed in sections as follows. The tuff cover at the sides and  
158 top of the stack will be removed in increments of approximately 30 ft. After waste retrieval from  
159 this section, another 30-ft section of top and side cover will be removed and the waste containers  
160 in this 30-ft section will be retrieved. This process will continue until all Pad 2 waste has been  
161 retrieved. The exposed sections of the stack will be covered with a heavy-gauge tarp when  
162 removal operations are not underway (evenings, weekends, etc.).

163 The tuff cover removed from Pad 2 will be screened for radionuclide contamination when  
164 analytical or real-time monitoring data indicates contamination. Clean tuff removed from the

165 pad may be used as fill in a LLW disposal pit or as appropriate in other operations. When the  
166 tuff has been dropped below the top row of waste packages, the crates will be otherwise  
167 supported, as needed, until the working face has been brought into a stable, stepped  
168 configuration.

169 When all of the tuff has been removed from the working face, an air sample will be drawn from  
170 within the plywood and plastic cover. In conjunction with continuous monitoring throughout the  
171 entire project, this sample will help health physics technicians (HPTs) and industrial hygienist  
172 technicians (IHTs) determine the extent of respiratory protection required during the removal of  
173 the plywood and plastic sheeting. Additional air samples will be drawn whenever the onsite IHT  
174 or HPT considers this to be necessary. After tuff removal, the plastic and plywood will be  
175 removed and disposed as appropriate.

#### 176 **5. Pad 2 Waste Package Retrieval**

177 After the tuff has been removed from the working face and unnecessary dirt removal equipment  
178 removed from the working area, waste package retrieval can begin. Retrieval equipment will  
179 typically include forklifts, a small crane, a front-end loader, temporary enclosures, fixed-head air  
180 samplers, HEPA-filtered vacuum cleaners, hand-held tools, and other equipment as needed. The  
181 exposed sections of the stack will be covered with a heavy-gauge tarp when removal operations  
182 are not underway (evenings, weekends, etc.).

183 The waste package configuration within the stack can vary, but the most common arrangement  
184 consists of crates stacked along the sides and ends of individual storage cells, with drums stacked  
185 in the center. Crates are seldom stacked more than two high (with the largest crates on the  
186 bottom), and drums are commonly stacked four high. Waste package data, including an

187 identification number, radioisotopic data, LANL waste content code, waste generator, weight,  
188 and the date the package was sealed are readily available from the TRU waste database. The  
189 database information will be available at the work site so that workers will know the nature of  
190 the waste packages before they are handled.

191 **a. Crates**

192 Because FRP crate construction was not standardized when the waste was packaged, crate  
193 handling during waste retrieval cannot be standardized. The exact retrieval method used will be  
194 determined on a case-by-case basis. One method for crate retrieval may be to remove all waste  
195 packages around the individual crate, attach a long section of horizontally suspended I-beam (a  
196 strongback) with fabric slings spread to prevent crushing the top of the container, and to lift the  
197 crate by strongback with a small crane or a forklift. An alternate method for FRP crate removal  
198 may involve using a large capacity forklift. If the bottom of the crate is significantly degraded, a  
199 metal sheet can be slid under the crate and the slings will pick the crate up from this new metal  
200 base. Damaged crates will be handled on a case-by-case basis. Damaged crates will be repaired,  
201 overpacked, or repackaged as necessary to support removal from the retrieval area.

202 Interviews (October 1993) with technicians, who worked on the TRU Pads in the late 1980s,  
203 revealed that some crates may contain liquids. The interviews revealed two sources for this  
204 potential liquid. One potential source—rainwater—may be present because the crates were left  
205 outside for significant periods before they were covered with a plastic tarp and overburden. The  
206 second source for the potential liquids is associated with capped process piping and process  
207 piping that was used in conjunction with the gloveboxes. Though all piping was drained (as  
208 thoroughly as possible) and capped before placement into the crates, it is difficult for LANL to

209 ensure there are no residual liquids remaining within the capped pipes. Therefore, crates must be  
210 handled on a case-by-case basis, but all crates will be checked for rainwater and drained of  
211 rainwater as necessary. After each crate is inspected to ensure crate integrity, the crate will be  
212 sent directly to the appropriate storage dome. Those crates known to contain or suspected of  
213 containing liquids will be stored with secondary containment inside the appropriate storage  
214 dome.

215 **b. Drums**

216 Forklifts or a small crane will usually be used to retrieve steel drums. Drum retrieval will begin  
217 with a visual, in-place assessment of the drum integrity. The drum's visible sides, and visible  
218 portions of the bottom rim will be inspected for corrosion and pitting. Drums that fail the visual  
219 inspection will be reinforced and/or overpacked, as appropriate, before they are removed from  
220 the retrieval area.

221 If the drum appears to have integrity, it will be removed from the array using manual techniques  
222 and construction equipment. After the drum is safely in the drum staging area, a thorough  
223 radiological survey for contamination will be conducted. Should removable surface  
224 contamination be detected, worker protective measures will be evaluated and contamination-  
225 control procedures, such as vacuuming, fixation, or plastic wrapping, will be implemented before  
226 handling. Dust and dirt will be removed from the drum using filtered vacuuming or manual  
227 cleaning.

228 During drum retrieval, fixed-head air samplers will be used to monitor for potential airborne  
229 contamination. At the end of each work period, if air samplers indicate elevated airborne  
230 radioactive contamination, a portable localized ventilation system will be evaluated for use, to

231 control sources of airborne contamination. In addition, temporary enclosures as discussed in  
232 Section 3, may be used to control potential airborne contamination.

233 Drums that potentially contain liquids may be examined by real time radiography (RTR). Any  
234 drum that is determined to contain liquids shall be placed into storage with secondary  
235 containment.

## 236 **6. Drum Preparation**

237 Drums received at the Drum Preparation Facility will be unloaded by forklift to the ground where  
238 they will be transferred onto multi-wheeled dollies or drum carts to be cleaned, inspected,  
239 surveyed for contamination, painted as necessary and/or vented as necessary. A permanent bar  
240 code label containing the drum identification number will be affixed to the drum after this  
241 cleaning and inspection. This drum identification number will be cross-referenced to the original  
242 drum identification number contained in the LANL TRU waste database.

243

244 The Drum Preparation Facility will be using two high-impact pressure, high-temperature,  
245 industrial MART Corporation drum washers to clean soil and the rust preventive agent from the  
246 outside surface of retrieved drums. Thorough cleaning is necessary in order to conduct a  
247 complete evaluation of each drum's integrity and to allow the application of drum labels. The  
248 MART Cyclone 30 drum washers minimize waste generation by recycling the water-based  
249 cleaning solution and prevent waste release by enclosing the process in a sealed cabinet.

250

## 251 **7. Drum-Venting System**

252 All drums will be vented to meet the Waste Acceptance Criteria of the storage facility as  
253 necessary. Drums will be placed one at a time, into the skid mounted Drum Venting System  
254 (DVS) where the drum lid will be punctured and a gas sample drawn. The explosivity of the gas  
255 mixture will be determined, and a HEPA-filtered vent will be installed. If a drum actually  
256 contains an explosive mixture, it will either be purged or simply allowed to aspirate until a safe  
257 mixture is attained.

258 **8. Transportation**

259 Retrieved waste crates and drums will be transported, as appropriate, to the Drum Preparation  
260 Facility, to storage, or from the Drum Preparation Facility to storage. The equipment used to  
261 manipulate packages will usually be forklifts with forks, drum lifting attachments, booms, or  
262 cranes with strongbacks or slings. The vehicles used to transport waste packages within TA-54  
263 will be either stake bed trucks or trailers that have been selected to achieve the minimum lifting  
264 and handling requirements. Closed transport vehicles will not be necessary because adequate  
265 surge capacity at each point in the retrieval and storage process will ensure that the waste is not  
266 moved during inclement weather.

267 **9. Storage Operations**

268 Within the storage domes, the waste packages will be handled by common commercial  
269 equipment such as forklifts with drum lifting attachments, strongbacks, and slings. Other  
270 equipment in the storage enclosures may include an assortment of survey instruments, CAMS,  
271 eye wash stations and fire extinguishers.

272 To allow for inspection, crates will be arranged in rows and stacked to a maximum of 3-crates  
273 high and 1-crate wide, with at least 24 in. between rows. Fifty-five-gal. drums of similar wastes

274 will be banded together on pallets and may be stacked 3-pallets high. Rows will be at least 24 in.  
275 apart. Overpacked drums will receive similar treatment. Any container from the TRU Pads that  
276 has been confirmed to contain liquid will be stored in Dome 230 or segregated within one of the  
277 operating storage domes with secondary containment. Whenever waste packages are moved out  
278 of a storage dome, the waste package identification numbers, their origin and destination, and  
279 package changes (overpack volume and/or dimensions) will be documented and used to update  
280 the TRU waste database.

281

COMPLIANCE SCHEDULE: Attachment "C" (10/25/93)

282

Complete <sup>1</sup>	LANL <sup>2</sup>	Submit Preliminary Construction Design Criteria for storage domes 1, 4, A, B, C, and D (hereinafter referred to as Area G TRU Storage Units).
Complete	NMED	Issue initial comments for design document submitted 07/01/93.
Complete	LANL	Submit Part B application, including Title II (Definitive Design) documentation, for Area G TRU Storage Units.
Complete	NMED	Conclude Administrative Completeness Review of the permit application <sup>3</sup> . Issue a Notice of Deficiency, if necessary.
11/05/93	LANL	Submit a request to the Secretary or Designee for permit modification.
11/15/93	LANL	Submit a complete response to NMED's Notice of Deficiency, if issued, for the Administrative Completeness Review.
12/13/93	LANL	Hold a public meeting regarding the permit modification request.
12/17/93	NMED	Conclude initial Technical Completeness Review of the permit application. Issue a Notice of Deficiency, if necessary.
01/21/94	LANL	Submit a complete response to NMED's Notice of Deficiency, if issued, for initial Technical Completeness Review

02/04/94	NMED	Conclude final Technical Completeness Review of the permit application.
02/07/94	NMED	Either approve the modification request, with or without changes, and modify the permit accordingly; deny the modification request; require that the modification request follow procedures for Class III M modifications; or notify LANL that the Secretary or Designee will decide on the request within the next thirty days. <sup>4</sup>
02/18/94	LANL	Submit additional information as requested by NMED on 2/07/94.
03/08/94	NMED	Secretary or Designee issues final decision on permit modification.
09/30/98	LANL	Complete Pad #1 Retrieval.
09/30/2000	LANL	Complete Pad #4 Retrieval.
[Effective Date of Consent Order] /2003 <sup>5</sup>	LANL	Complete pad <sup>2</sup> retrieval and have all wastes from Area G hazardous waste storage Pad #s 1, 2 and 4 placed into Area G TRU Storage Units.

283 Notes

284

285 1. The first milestones predate the agreement and have been accomplished.

286

287 2. For the purposes of this Compliance Schedule, "LANL" means the respondents, the Regents  
288 of the University of California and the Department of Energy.

289

290 3. For the purposes of this Compliance Schedule, "Permit Application" means only those  
291 portions related to the Area G TRU Storage Units.

292

293 4. In the event that a determination is made that it is necessary to follow Class III procedures,  
294 the schedule shall be extended according to regulation to account for the additional time  
295 required to comply.

296

297 5. See Consent Agreement "A" (Secretary's Final Order).

298