2390

DE/LAO File

State of New Mexico
ENVIRONMENT DEPARTMENT
Harold Runnels Building
1190 St. Francis Drive, P.O. Drawer 26110
Santa Fe, New Mexico 87502-6110

GARY E. JOHNSON
Governor

PETER MAGGIORE
Secretary

RECEIVED

Via U.S. Mail
October 23, 1998

Mr. Joseph B. Rochelle
LANL-Laboratory Counsel
General Law Offices
P. O. Box 1663/MS A 187
1650 Trinity Drive
Los Alamos, NM 87545

Re: TWSP Revised Remedial Action Plan

Dear Mr. Rochelle:

Enclosed for your files is a copy of the fully executed TWSP Revised Remedial Action Plan.

Sincerely,

Nicholas F. Persampieri

Nicholas F. Persampieri
Assistant General Counsel

cc: John Tymkowych, HRMB

16753

Attachment B

Revised Remedial Action Plan

This Revised Remedial Action Plan amends the Amended 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 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 the Revised Remedial Action Plan 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 the Revised Remedial Action Plan, 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.

APPROVED:

for DJE

Dennis J. Erickson
Division Director
Environment, Safety and Health Division
Los Alamos National Laboratory

10/15/98
DATE

for David Gurulé
Area Manager
Los Alamos Area Office
U.S. Department of Energy

10/16/98
DATE

Edward Kelley
Director Water and Waste Management Division
New Mexico Environment Department

10/22/98
DATE

for Peter Maggiore
Secretary
New Mexico Environment Department

10.23.98
DATE

The following sections present listed actions and a phased plan necessary to retrieve TRU radioactive and TRU mixed waste from TRU Pads 1, 2, and 4 and place into inspectable storage. A Safety Analysis Report has been prepared and approved for this remedial action. Changes to the Safety Analysis Report (SAR) are accomplished using the established DOE Order 5480.21 Unreviewed Safety Question Determination (USQD) Program. All proposed changes to the Transuranic Waste Inspectable Storage Project (TWISP) operational procedures/processes undergo a review in accordance with the requirements of the USQD Program. In the event that changes to operations or the SAR affect the requirements in this Revised Remedial Action Plan (Revised RAP), the USQD Program will be the change mechanism utilized, and interim method of documentation, for the Revised RAP.

The USQD Program is designed to allow the TWISP to make limited changes to the content of the SAR thus allowing flexibility in day to day operations. The program requires TWISP management to formally review all changes (operational, design, etc.) prior to implementation. The changes are reviewed against the following criteria:

- Could the change increase the probability of an accident?
- Could the change increase the consequences of an accident?
- Could the change increase the probability of failure of equipment important to safety?
- Could the change increase the consequences of failure of equipment important to safety?
- Could the change create a new failure mechanism of equipment important to safety?
- Could the change create a new accident type?
- Will the change reduce the margin of Safety?

If any of these questions are answered in the affirmative, the TWISP must justify how controls will be in place to minimize the risk associated with the change. Additionally, DOE must approve the change. The USQD Program cannot be used to change the project deliverables as specified in Attachment C. NMED will be notified in writing immediately upon initiation of the USQD process for any changes in TWISP operations that affect procedures as described in this Revised RAP. All such USQDs finally approved by DOE and the University of California shall be incorporated during an annual review cycle, and provided to NMED on or before 1/30 of the year following the change. Changes to this plan may be made to ensure:

- worker and public safety
- protection of the environment
- the most safe and effective method is used to retrieve the waste
- compliance with State requirements

Listed Actions

Completed Actions

1. Established a site-specific environmental surveillance program.
2. Installed high-volume air samplers.
3. Prepared and completed ES&H documentation, as necessary.
4. Procured Special Equipment for Retrieval and Storage operations.
5. Prepared Preliminary Safety Analysis Report.
6. Prepared and obtained approval of the TWISP Final Safety Analysis Report.
7. Completed Design Upgrades to existing Drum Prep Facility.
8. Completed Final Design for TRU Waste Retrieval Dome Project[1].
9. Completed Final Design for TRU Waste Temporary Storage Dome Project[1].
10. Completed Design of Drum Vent System.
11. Prepared and obtained approval of Detailed Operating Procedures.
12. Fabricated and Tested Drum Vent System.
13. Procured Contractor.
14. Completed Construction of Retrieval Dome over Pad 1; Completed Construction of Storage Domes for Pad 1 waste.
15. Completed Personnel Training/Operational Readiness Review.
16. Completed Construction of Storage Domes for Pad 4 waste.
17. Completed Retrieval Operations on Pad 1.

Actions to be Completed

1. Complete Retrieval Operations on Pad 4.
2. Complete Construction of Retrieval Dome over Pad 2.
3. Complete Construction of Storage Dome over Pad 4.
4. Complete Retrieval Operations on Pad 2.
5. Complete Salvage of Retrieval Equipment and Retrieval Dome.

1) 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.

The Retrieval Operation

A. Construction and Retrieval Phasing

The retrieval of waste from TRU Pads 1, 2, and 4 is organized into four construction phases. After each of the first three construction phases, waste is retrieved from TRU Pads 1, 4, and 2, respectively. The fourth construction phase is necessary to salvage equipment, and disassemble the retrieval dome. Each construction phase is divided up into two separate projects; the Retrieval Project and the Storage Dome Project.

Project site activities began with Construction Phases I-R and I-S (-R refers to the Retrieval Project and -S refers to the Storage Dome Project). Activities within Phases I-S and I-R are clearly identified in Figures 1 and 2.

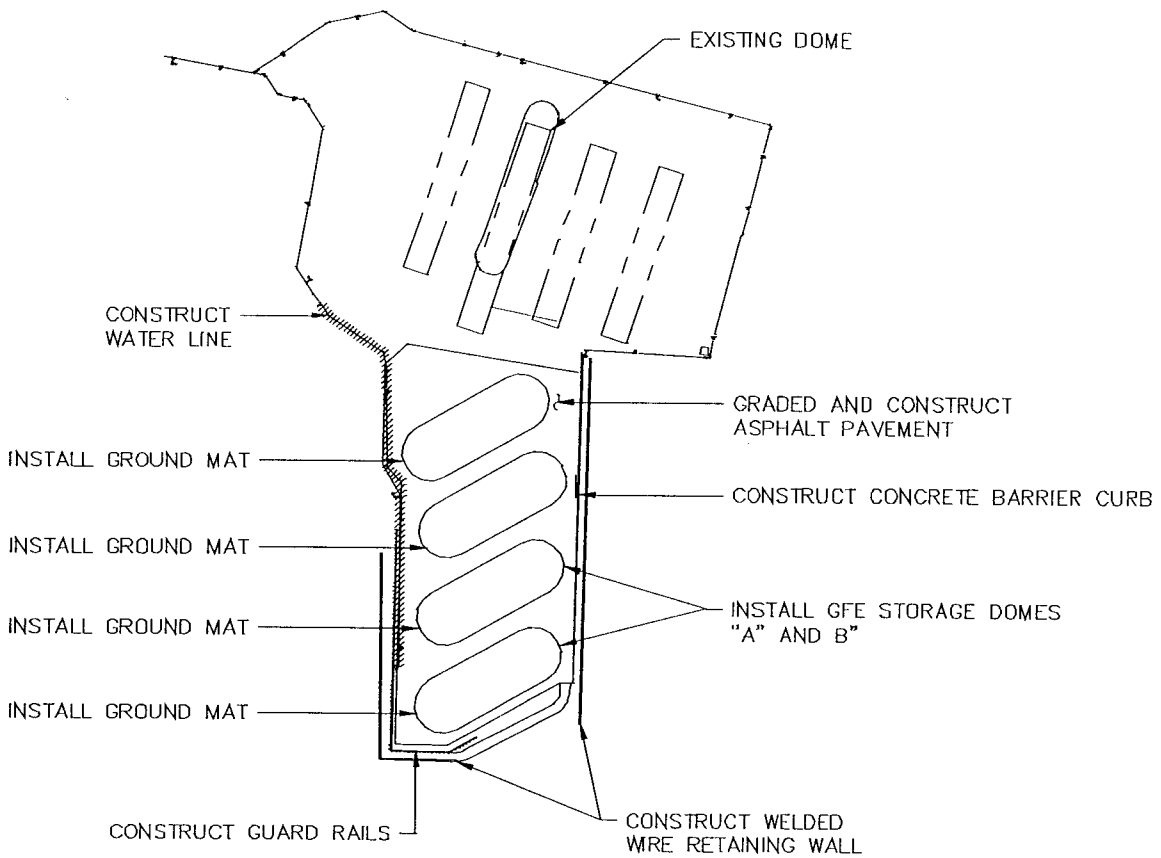


Figure 1. Construction Phase I–S

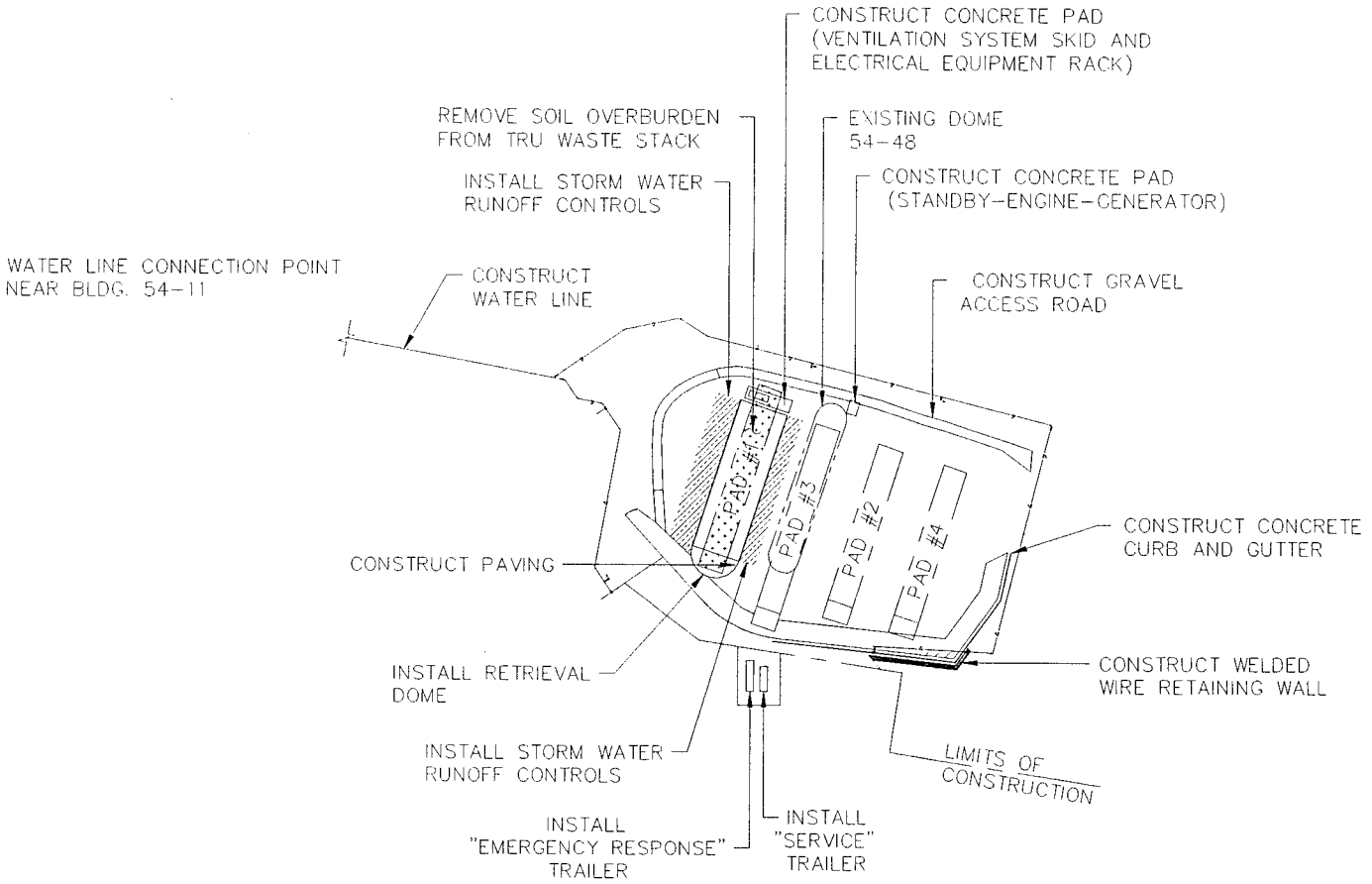
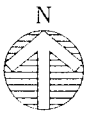


Figure 2. Construction Phase I-R



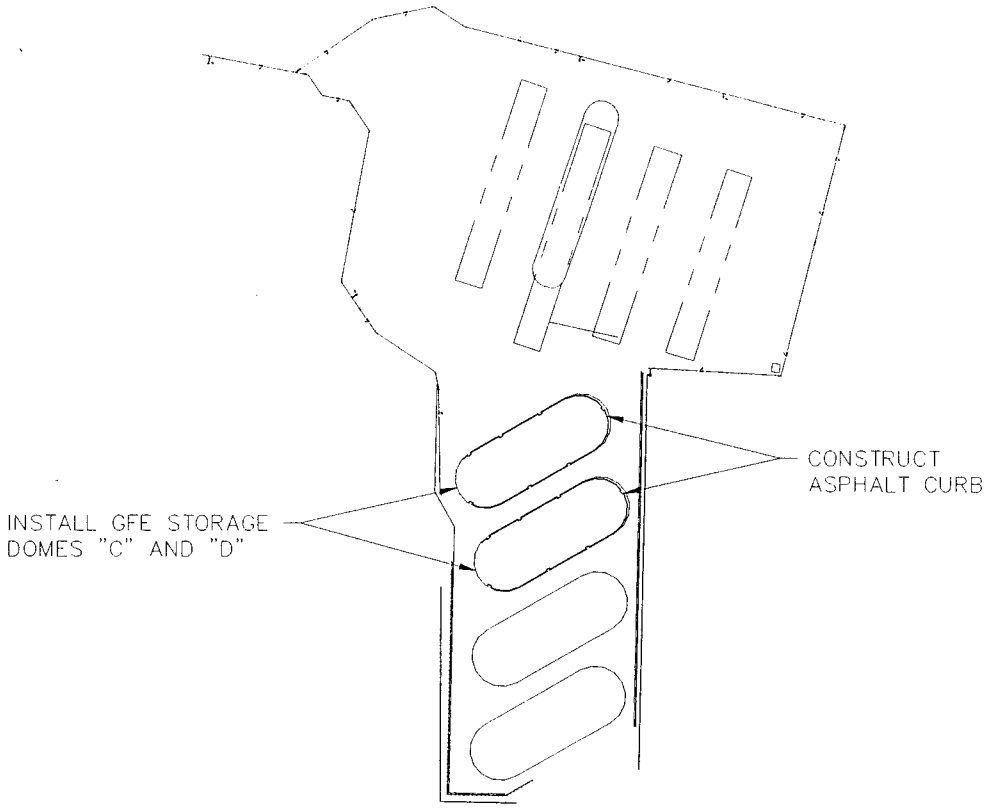
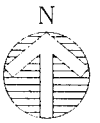


Figure 3. Construction Phase II-S



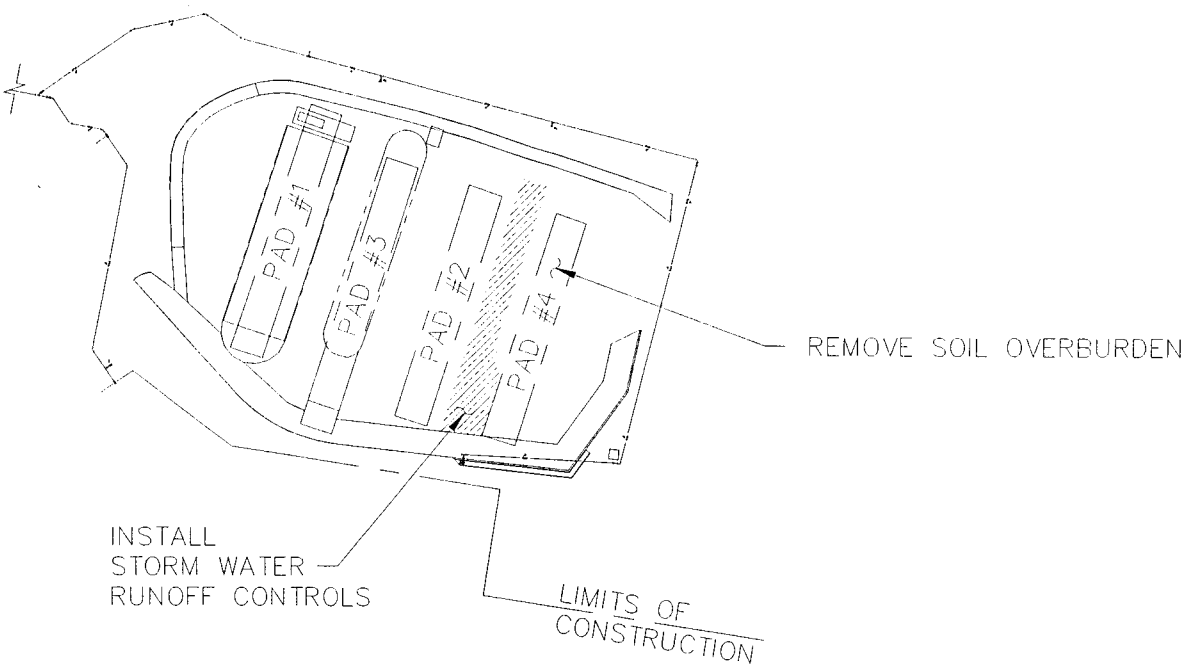
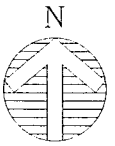


Figure 4. Construction Phase II-R



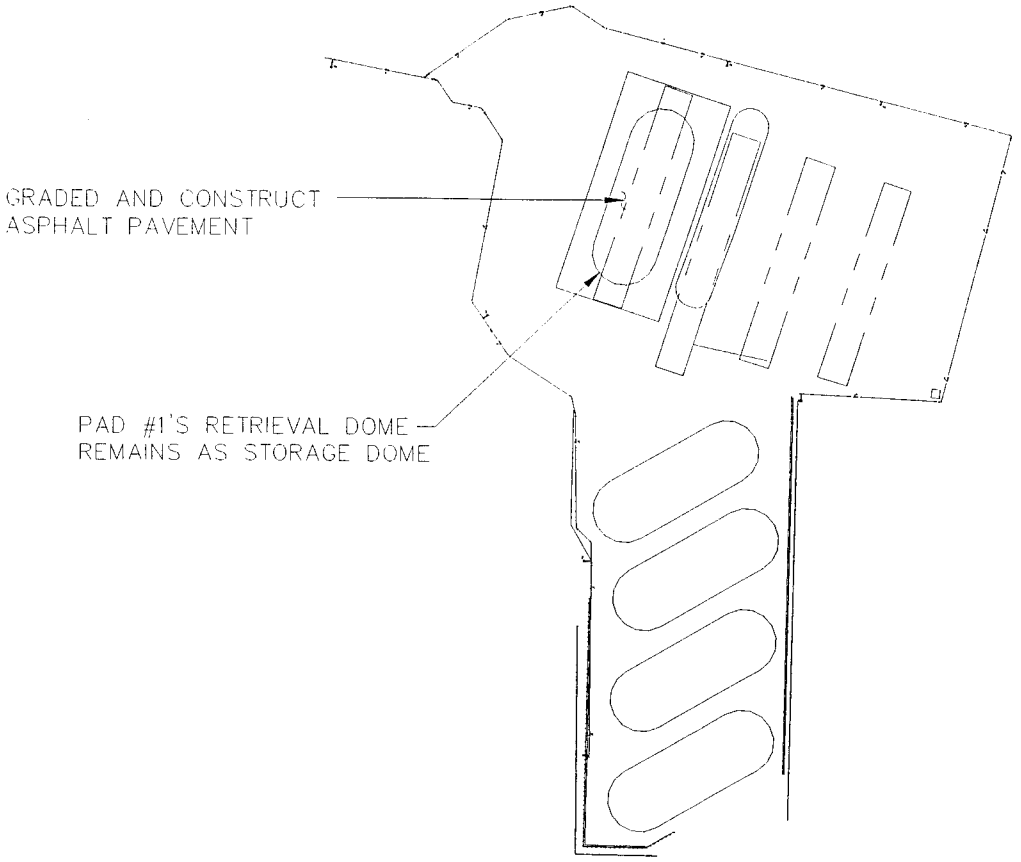
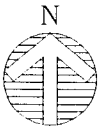


Figure 5. Construction Phase III-S



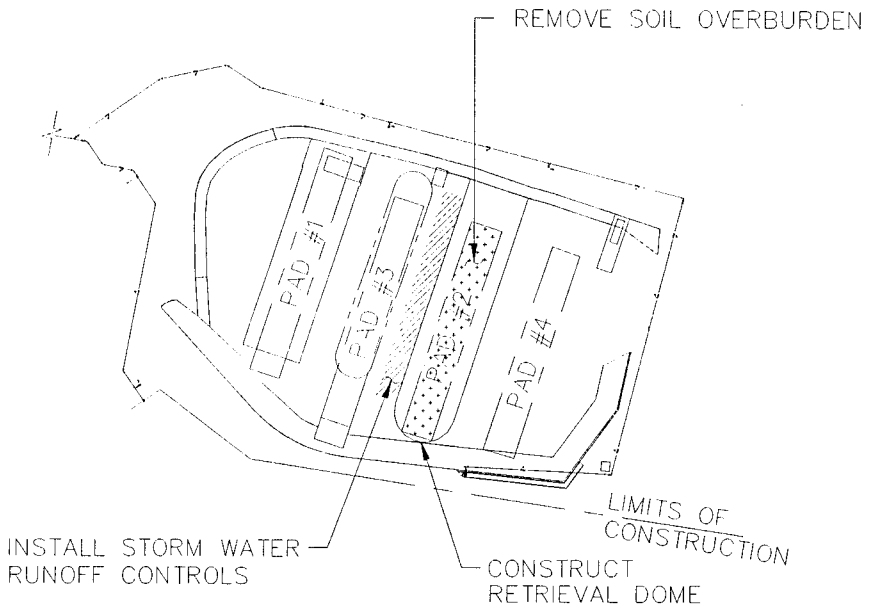
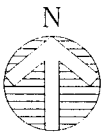


Figure 6. Construction Phase III-R



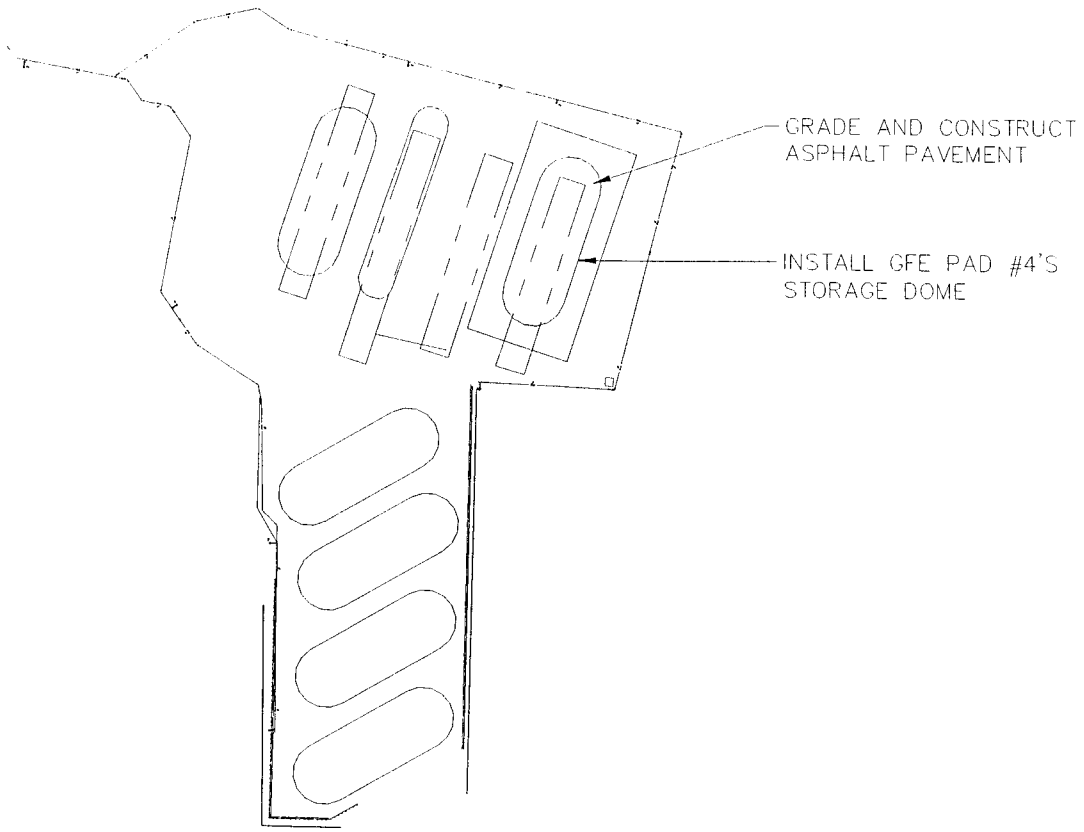
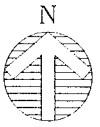


Figure 7. Construction Phase IV-S



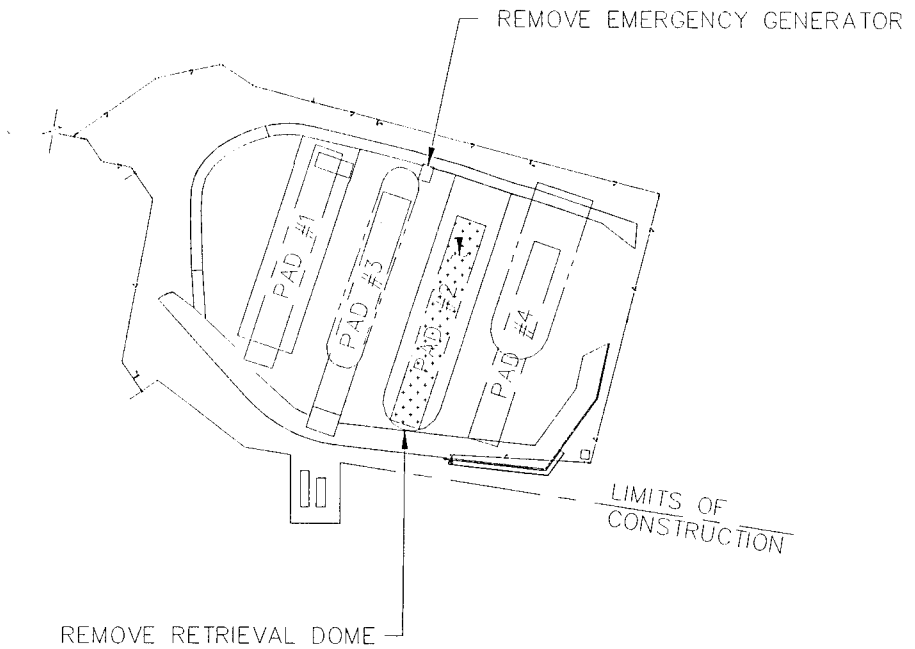
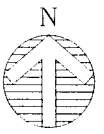


Figure 8. Construction Phase IV-R



B. Detailed Description

1. Storage Domes

Construction Phases I-S and II-S have been completed. Site work has been performed to ensure that stormwater discharge requirements under the Laboratory's National Pollution Discharge Elimination System (NPDES) general permit are met and best management practices for stormwater runoff are utilized. Each of the storage domes is a tension supported structure with fabric walls and aluminum support. Asphalt curbs have been installed around the inside perimeter of each of the domes. Power, communication systems, and fire protection (hydrants) services have been extended as needed to the domes.

The existing retrieval dome over Pad 1 will remain for storage and other management activities upon completion of retrieval activities on Pad 1.

Preparatory site work has been completed for Pad 4. Similar to what was done for Pad 1, asphalt will have to be added to Pad 4. The Laboratory fully expects Pad 4's asphalt to be in excellent condition. If the asphalt is not in excellent condition, that is if 30% or more of the asphalt pad is degraded, the entire asphalt pad will be replaced. In any case, any damaged portions of asphalt will be repaired. Utilities and Site stormwater runoff controls will be established similar to Construction Phases I-S and II-S.

2. Retrieval Dome

Construction Phase I-R has been completed. A substantial amount of site work was conducted that focused around Pad 1. The site work included: water line installation, asphalt access paving along south edge of the site, extension of electrical power, installation of stormwater runoff controls, removal of the majority of the tuff cover over Pad 1 and erection of the Retrieval Dome over Pad 1. All tuff cover was not removed because it was necessary to leave minimal cover of soil on top of the stack to provide weather protection and a fillet of tuff around the perimeter to support and stabilize the stack of waste containers. As appropriate, the tuff was screened for radionuclide constituent contamination. Clean tuff removed from the pad was either taken to the current LLW disposal pit for use as backfill or used as fill for Construction Phase I-S. No contaminated soil was identified.

Once site preparation for the Retrieval Dome was complete and the Retrieval Dome was erected, equipment and structural accessories necessary to ensure the Retrieval Dome was functional were installed. The HEPA-filtered exhaust system and associated ductwork were installed and attached to the skidmounted exhaust blower and filter bank. Personnel doors for emergency egress are present along both sides of the work area. Electrical power was extended into the Retrieval Dome to power continuous air monitors (CAMs) and local and general ventilation systems, as needed. Support trailers were located near Pads 1, 2, and 4.

Once the waste from Pad 1 is retrieved, Construction Phase II-R for retrieval of Pad 4 waste will then begin. The Pad 1 Retrieval Dome will be maintained for use as a storage and waste processing facility. This phase includes preparatory site work at Pad 4, equipment relocation as needed and installation of stormwater runoff controls.

Mobile enclosures constructed of fabric or plastic will be available for use should potentially damaged drums and/or boxes be encountered. Portable HEPA systems will be available during

retrieval operations, and will be utilized if needed. Monitoring requirements will be determined and routinely evaluated to ensure that monitoring is adequate for retrieval operations. Electrical service for equipment, in addition to grounding and lightning protection systems, will be provided in accordance with applicable requirements.

After retrieval operations at Pad 4 are complete, Construction Phase III-R for retrieval of Pad 2 waste will then begin. Similar to Construction Phase II-R, this phase includes preparatory site work around Pad 2 including installation of stormwater runoff controls and equipment relocation as needed. The protective measures identified for Pad 4 will be implemented for Pad 2, if needed. Finally, after retrieval operations are finished on Pad 2, Construction Phase IV-R will ensure that all equipment is either salvaged or disposed as appropriate.

3. Soil Removal

As retrieval operations progress on each pad, the tuff over the working face of the stack will be removed by various pieces of earth moving equipment and supplemented by hand loading tuff as needed.

The fillet of tuff across the front of the stack and that extends along the sides near the working face will also be removed by various pieces of earth moving equipment and hand loading if needed. When the fillet has been dropped below the top row of waste packages, the crates will be otherwise supported, as needed, until the working face has been brought into a stable, stepped configuration. As the working face of the stack retreats, the soil removal operation will be repeated.

When all of the tuff has been removed from the working face, an air sample will be drawn from within the plywood and plastic cover. Along with the continued monitoring throughout the entire project, this sample will help Health Physics (HPT) and Industrial Hygienist (IHT) Technicians determine the extent of respiratory protection required during the removal of the plywood and plastic sheeting. After tuff removal, the plastic and plywood cover material will be disposed as appropriate.

4. Waste Package Retrieval

After the tuff has been removed from the working face and unnecessary dirt removal equipment removed from the working area, waste package retrieval can begin. Retrieval equipment will typically include forklifts, a small crane, a front-end loader, temporary enclosures, CAMS, giraffe air monitors, HEPA-filtered vacuum cleaner and HEPA-filtered ventilation system, hand-held tools, and other equipment as needed.

The waste package configuration within the stack can vary, but the most common arrangement consists of crates stacked along the sides and ends of individual storage cells, with drums stacked in the center. Crates are seldom stacked more than two high (with the largest crates on the bottom), and drums are commonly stacked four high. Waste package data, including an identification number, radioisotopic data, LANL waste content code, waste generator, weight, and the date the package was sealed are readily available from the TRU waste database. The database information will be available at the work site so that workers will know the nature of the waste packages before they are handled.

a. Crates

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

Interviews (October 1993) with technicians who worked on the TRU Pads in the late 1980s, revealed that some crates may contain liquids. The interviews revealed two sources for this potential liquid. Rainwater is one potential source. The rainwater may be present because the crates were left outside for significant periods before they were covered with a plastic tarp and overburden. The second source for the potential liquids is associated with capped process piping and process piping that was used in conjunction with the gloveboxes. Though all piping was drained (as thoroughly as possible) and capped before placement into the crates, it is difficult for the Laboratory to ensure there are no residual liquids remaining within the capped pipes. Therefore, crates must be handled on a case-by-case basis, but all crates will be checked for rainwater and drained of rainwater as necessary. After each crate is inspected to ensure crate integrity, the crate will be sent directly to the appropriate storage dome. Those crates known to contain liquids will be stored with secondary containment inside the appropriate storage dome. Crates suspected of containing water, which might leak, will be stored with secondary containment inside the appropriate storage dome.

b. Drums

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

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

During drum retrieval, continuous air monitors (CAMs) will be utilized to monitor for potential airborne contamination. In the event a CAM alarm occurs, a portable localized ventilation system will be used, as appropriate, to control any sources of airborne contamination. In addition, temporary enclosures as discussed in Section 2, may be used to control potential airborne contamination.

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

5. Drum Preparation

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

6. Drum-Venting System

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

7. Transportation

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

8. Storage Operations

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

Crates will be arranged in rows, two high and one wide, with at least 24 inches between rows to allow for inspection. 55-gallon drums of similar waste will be banded together on pallets which are then stacked three high in rows at least 24 inches apart. Overpacked drums will receive similar treatment. Any container, from the TRU Pads, that has been confirmed to contain liquid will be stored in Dome 230 or segregated within one of the operating storage domes with secondary containment. Whenever waste packages are moved out of a storage dome, the waste package identification numbers, their origin and destination, and package changes (overpack volume and/or dimensions) will be documented and used to update the TRU waste database.

280
281

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

Complete[1]	LANL[2]	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[3]. 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.[4]
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[5]	LANL	Complete pad[2] retrieval and have all wastes from Area G hazardous waste storage Pad #s 1, 2 and 4 placed into Area G TRU Storage Units.

Notes

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

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

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

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

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

Los Alamos

NATIONAL LABORATORY
Laboratory Counsel *General Law Offices*

P. O. Box 1663/MS A187
1650 Trinity Drive
Los Alamos, New Mexico 87545
(505) 667-3766, FAX:665-4424

Date: September 2, 1998

Symbol: GL: 10520-9604/9837

OPTIONAL FORM 99 (7-90)

FAX TRANSMITTAL

To Benito Garcia	# of pages ▸ 2
Dept./Agency	From Jim Seebart
Fax #	Phone # 665-5326
	Fax #

NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

Nicholas F. Persampieri, Esq.
Assistant General Counsel
NMED Office of General Counsel
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502

RE: COMPLIANCE ORDERS 93-01, 93-02, 93-03 AND 93-04: PROPOSED CHANGES TO THE AMENDED REMEDIAL ACTION PLAN, ATTACHMENT B, TO CONSENT AGREEMENT APPROVED BY THE SECRETARY OF THE NEW MEXICO ENVIRONMENT DEPARTMENT (NMED) BY FINAL ORDER ON DECEMBER 10, 1993.

Dear Mr. Persampieri:

The purpose of this letter is to request review and approval of proposed changes to the above referenced Amended Remedial Action Plan (Amended RAP), as provided for in the attached red-line/strike through copy of the Amended RAP. In a separate attachment, consisting of 6 pages, we have provided the rationale and justification for each of the proposed changes.

The original Remedial Action Plan (RAP) was approved as Attachment B to the Consent Agreement for Compliance Orders 93-01, 93-02, 93-03 and 93-04 (Orders), which was approved by Final Order of the Secretary of NMED on December 10, 1993. The RAP addressed the removal of drums and boxes of waste in storage under earthen cover at Pads 1, 2 and 4 at Technical Area 54 at Los Alamos National Laboratory, and placement of these drums and boxes in inspectable array in approved permitted storage domes. The original RAP contained an acknowledgment that changes to its text may be appropriate on a number of grounds, including the need to ensure worker and public safety and to ensure that the most safe and effective method is used to retrieve the waste.

The original RAP was amended in February, 1997, before the first actual waste retrieval was to begin on Pad 1, primarily for the purpose of increasing flexibility in waste retrieval practices. Rather than amending the original RAP in numerous places, a replacement document containing the requested changes was adopted and approved, and was referred to as the "Amended Remedial Action Plan."

Close to 18 months have now elapsed since the approval of the Amended RAP. A great deal of waste retrieval experience and know-how have been gained over this time and the retrieval of waste over Pad 1 is complete. As retrieval of waste over Pad 4 is set to begin in the immediate future, we would like to apply the knowledge and experience gained from Pad 1's waste retrieval process to improve and make more efficient the waste retrieval process for Pad 4, while continuing to take the measures necessary to protect worker safety and the environment. The changes being proposed in the attached document, for clarity's sake referred to as the "Revised Remedial Action Plan", should help achieve these objectives. A "clean copy" of the proposed Revised RAP has also been provided for your review.

The Transuranic Waste Inspectable Storage Project (TWISP) staff are very eager to begin waste retrieval on Pad 4, and would be more than happy to answer questions, do a presentation, and/or provide a tour of the TWISP facilities in order to further clarify the purpose of the proposed changes and to address any concerns that NMED may have.

Since the proposed Revised RAP addresses compliance matters that arose out of a series of compliance orders, we thought it appropriate to address this matter, at least initially, through legal channels. We would be happy to discuss this matter with you at your convenience. Joseph Rochelle can be reached at (505) 665-2286 and Hortense Haynes can be reached at (505) 667-4667. Our technical staffs are likewise available to discuss this matter with NMED's technical staff at the latter's convenience. Thank you for your assistance with regard to this matter.

Sincerely,

Joe Rochelle by Joann Foster
Joseph B. Rochelle

Hortense Haynes by Joann Foster
Hortense Haynes

Cys: David Gurule, DOE, w/enc., A316
Joseph Vozella, DOE, w/enc., A-316
Jody Plum, DOE, w/enc., A316
Dennis Erickson, w/enc., ESH-DO, K491
Tom Baca, EM-DO, w/enc., J591
Tony Stanford, EM-SWO, w/enc., J595
Jim White, ESH-19, w/enc., K490
Gilbert Montoya, EM-SWO w/enc., J595

Signed original held by Coby Mackelroy (CM)

NEW MEXICO ENVIRONMENT DEPARTMENT

ORIGINAL

IN THE MATTER OF: THE UNITED STATES DEPARTMENT OF ENERGY LOS ALAMOS NATIONAL LABORATORY LOS ALAMOS, NEW MEXICO ID. No. NM 0890010515, and THE REGENTS OF THE UNIVERSITY OF CALIFORNIA LOS ALAMOS NATIONAL LABORATORY LOS ALAMOS, NEW MEXICO ID. No. NM 0890010515, RESPONDENTS.	COMPLIANCE ORDERS NMHWA 93-01, 93-02, 93-03 & 93-04.

CONSENT AGREEMENT

NEW MEXICO ENVIRONMENT DEPARTMENT

IN THE MATTER OF: THE UNITED STATES DEPARTMENT OF ENERGY LOS ALAMOS NATIONAL LABORATORY LOS ALAMOS, NEW MEXICO ID. No. NM 0890010515, and THE REGENTS OF THE UNIVERSITY OF CALIFORNIA LOS ALAMOS NATIONAL LABORATORY LOS ALAMOS, NEW MEXICO ID. No. NM 0890010515, RESPONDENTS.	))))))))))))))))))	COMPLIANCE ORDERS NMHWA 93-01, 93-02, 93-03 & 93-04.

FINAL ORDER

The Secretary, having reviewed the above-captioned Consent Agreement including all attachments incorporated by reference, and having determined that it is consistent with the New Mexico Hazardous Waste Act, hereby approves the Consent Agreement and orders that it take full force and effect on this 10th day of December, 1993.

JUDITH M. ESPINOSA

ATTACHMENT "A"

2242 1098

Signed original held by Gaby Muckelroy

NEW MEXICO ENVIRONMENT DEPARTMENT

ORIGINAL

IN THE MATTER OF: THE UNITED STATES DEPARTMENT OF ENERGY LOS ALAMOS NATIONAL LABORATORY LOS ALAMOS, NEW MEXICO ID. No. NM 0890010515, and THE REGENTS OF THE UNIVERSITY OF CALIFORNIA LOS ALAMOS NATIONAL LABORATORY LOS ALAMOS, NEW MEXICO ID. No. NM 0890010515, RESPONDENTS.	COMPLIANCE ORDERS NMHWA 93-01, 93-02, 93-03 & 93-04.

CONSENT AGREEMENT

CONSENT AGREEMENT

TABLE OF CONTENTS

SECTION		Page
I.	PREAMBLE; PURPOSE OF AGREEMENT; BINDING EFFECT	1
II.	BACKGROUND/HISTORY	2
III.	JURISDICTION AND AUTHORITY	3
IV.	DEFINITIONS	3
V.	NMED'S FINDINGS OF FACT & CONCLUSIONS OF LAW	5
VI.	COMPROMISE & SETTLEMENT OF COMPLIANCE ORDERS	8
VII.	STIPULATED PENALTIES	10
VIII.	INTERIM STATUS	12
IX.	DOCUMENTS, INFORMATION & REPORTING REQUIREMENTS	12
X.	SITE ACCESS	14
XI.	RESOLUTION OF DISPUTES/ENFORCEMENT	15
XII.	COURT JURISDICTION/VENUE	18
XIII.	COMPUTATION OF TIME	18
XIV.	EXCHANGE OF DOCUMENTS	19
XV.	TIME FRAMES; EXTENSIONS; *FORCE MAJEURE*	21
XVI.	TERMINATION	24
XVII.	COMPLIANCE WITH APPLICABLE LAW	25
XVIII.	HOLD HARMLESS CLAUSE	27
XIX.	GOOD FAITH PERFORMANCE	27
XX.	TIME OF THE ESSENCE	27
XXI.	AMENDMENTS	27
XXII.	COVENANT NOT TO SUE	28
XXIII.	RIGHTS EXPRESSLY RESERVED/ENFORCEMENT	28
XXIV.	COSTS AND FEES.	29
XXV.	SEVERABILITY	29
XXVI.	DELEGATION	30
XXVII.	MERGER & INTEGRATION	30
XXVIII.	EFFECTIVE DATE	30
XXIX.	AUTHORITY OF SIGNATORY	31

ATTACHMENT A -- SECRETARY'S FINAL ORDER
ATTACHMENT B -- REMEDIAL ACTION PLAN
ATTACHMENT C -- COMPLIANCE SCHEDULE

2242 1055

CONSENT AGREEMENT

I. **PREAMBLE; PURPOSE OF AGREEMENT; BINDING EFFECT.**

A. This Consent Agreement, effective when the Secretary signs a final order approving it, is made and entered into by and between the United States Department of Energy ("Respondent" or "DOE"), an agency of the Federal Government, the Regents of the University of California, a public educational institution of the State of California ("Respondent" or "the University") (collectively "Respondents"); and the New Mexico Environment Department ("NMED"), an agency of the State of New Mexico.

B. The purpose of this Consent Agreement is to set forth the agreement of the parties resolving all matters related to New Mexico Hazardous Waste Act Compliance Order numbers 93-01, 93-02, 93-03 and 93-04 (hereinafter collectively "Compliance Orders"), including agreement on the penalties to be paid by the University for the violations alleged in the Compliance Orders, and including the Respondents' commitment to implement an NMED-approved remedial action plan and compliance schedule for placing mixed waste currently stored at the Los Alamos National Laboratory ("LANL") Technical Area 54, Area G into storage that complies with the New Mexico Hazardous Waste Act.

C. This Consent Agreement shall apply to and be binding upon NMED and Respondents and their respective successors and assigns. Except as provided in Section VI.B., the obligations of Respondents under this Consent Agreement shall be joint and several. Respondents' obligations under this Consent Agreement,

2242 1056

including without limitation the payment of stipulated penalties, so long as the obligations are fulfilled, may be satisfied in whole or in part by either the University or DOE. No change in the contractual relationship between the Respondents shall in any way alter Respondents' responsibilities under this Consent Agreement. If the contract between DOE and the University is terminated or expires prior to such time as the obligations of this Consent Agreement are fully completed, DOE agrees to impose upon any successor contractor at LANL the same obligations as are now imposed upon the University.

II. BACKGROUND/HISTORY.

A. LANL is located principally in Los Alamos County, New Mexico, approximately sixty (60) miles northeast of Albuquerque and twenty-five (25) miles northwest of Santa Fe. LANL encompasses approximately forty-three (43) square miles. LANL is owned by DOE and is operated by DOE and by the University pursuant to a contract with DOE.

B. LANL was chosen in 1942 as the site for the wartime development of the atomic bomb. The area was established as a military reservation, and operations began in 1943. Since 1943, the primary mission of LANL has been nuclear weapons research and development. In addition, the facility does work in magnetic and inertial fusion, nuclear fission, nuclear safeguards and security, laser isotope separation, and medical isotope development. In association with the activities identified above, Respondents

2242 1057

currently generate and store mixed waste.

C. On May 4-8, 1992, NMED inspectors conducted a hazardous waste inspection at LANL.

D. As a result of that inspection, on January 28, 1993, NMED issued Compliance Orders 93-01 and 93-02 to DOE and Compliance Orders 93-03, and 93-04 to the University alleging violations of the New Mexico Hazardous Waste Act in the handling and storage of hazardous waste and mixed waste at LANL.

III. JURISDICTION AND AUTHORITY.

A. NMED asserts jurisdiction and authority over the subject matter of this Consent Agreement pursuant to and including without limitation, the following statutes, regulations, and laws:

1. The Resource Conservation and Recovery Act,
2. The New Mexico Hazardous Waste Act and Regulations,
3. The New Mexico Department of Environment Act,
4. The New Mexico Environmental Improvement Act, and
5. The New Mexico statutory and common law of nuisance.

B. Respondents admit the jurisdictional allegations of the Compliance Orders and consent to the relief specified herein, including stated civil penalties to be paid by the University.

IV. DEFINITIONS.

A. **Compliance Schedule** shall mean the schedule set forth in Attachment "C" to this Consent Agreement.

B. **Consent Agreement** shall mean this document and any

2242 1058

attachments incorporated by reference into this document including without limitation the Remedial Action Plan and the Compliance Schedule.

C. **Days** shall mean calendar days unless otherwise specified in this consent agreement.

D. **Deliverable** shall mean any document required to be submitted to NMED for review or comment as set forth in the Consent Agreement.

E. **Due date** shall mean those dates designated as such in the Compliance Schedule on or before which Respondents must complete an activity or submit a deliverable to NMED, or be liable for stipulated penalties as set forth in Section VII.

F. ***Force majeure*** shall mean any event arising from unforeseeable causes beyond the control of Respondents which could not be overcome by due diligence or contractual arrangement, and which delays or prevents performance by a date required by this Consent Agreement. *Force majeure* does not include unanticipated or increased costs of performance, the changed economic circumstances of either Respondent, any solely discretionary actions specifically authorized to be taken by NMED or the Secretary under this Consent Agreement, or enforcement action brought by NMED against Respondents, whether related to this Consent Agreement or not.

G. **Hazardous waste** is defined at § 74-4-3.I. of the New Mexico Hazardous Waste Act (HWA), and in New Mexico Hazardous Waste Management Regulations (HWMR) 6, § 101, which incorporates federal regulation 40 CFR § 260.10.

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H. **Mixed waste** is defined as waste which contains a hazardous waste component regulated under Subtitle C of the Resource Conservation and Recovery Act, 42 U.S.C.§§ 6921 to 6939b, and the HWA; and a radioactive component consisting of source, special nuclear, or byproduct material regulated under the federal Atomic Energy Act of 1954 (AEA).

I. **Remedial Action Plan** shall mean the remedial action plan set forth in Attachment "B" to this Consent Agreement.

J. **Secretary** shall mean the Secretary of the New Mexico Environment Department or her designee.

K. **Sole discretion** when used in relation to an action or decision of the Secretary or NMED under this Consent Agreement shall mean that such action or decision is not subject to the dispute resolution procedures of Section XI, and that such decisions are binding upon the Respondents unless timely appeal is taken in accordance with §74-4-14 of the Hazardous Waste Act.

L. **Other terms** not specifically defined herein, if defined in RCRA or the HWA or regulations promulgated under those Acts, shall be accorded their meaning in those Acts or regulations. Terms not defined in those Acts or their implementing regulations shall be accorded their usual and ordinary dictionary meaning or their common meaning in usage, case law or in the applicable trade or profession.

V. NMED's FINDINGS OF FACT AND CONCLUSIONS OF LAW.

As a result of NMED's May 4-8, 1992 inspection at LANL, NMED

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made findings of fact and conclusions of law under the New Mexico Hazardous Waste Act (HWA), NMSA 1978, § 74-4-1 through 11 (Repl. Pamp. 1990), and HWMR-6 which in part incorporate by reference the United States Environmental Protection Agency hazardous waste regulations. Those findings of fact and conclusions of law are set forth in the Compliance Orders which are incorporated by reference into this Consent Agreement. Under the legal authorities set forth above, NMED makes the following supplemental findings of fact and conclusions of law:

A. **Supplemental Findings of Fact.**

1. HWMR-6, § 301, incorporated federal regulations 40 CFR § 262.34(c)(1)(i) requires Respondents to keep all hazardous waste containers closed at satellite accumulation points.

2. HWMR-6, § 301, incorporated federal regulations 40 CFR § 262.34(c)(1)(ii) requires Respondents to mark all containers at satellite accumulation points with the words "hazardous waste" or with other words that identify the contents of the container.

3. On March 15, 1993, Respondents provided written confirmation and photographic evidence acceptable to NMED that hazardous waste stored at TA 3-40 has been removed.

4. On March 15, 1993, Respondents provided written confirmation and photographic evidence acceptable to NMED that waste in those containers of the sixteen (16) exhumed at TA-54 Area G Pad #2 that were not in good condition or which were beginning to leak, had been transferred to containers that are in good condition.

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5. On March 15, 1993, Respondents provided written confirmation acceptable to NMED in the form of copies of the signed, original manifests for hazardous waste shipments dated September 26, 1991, and September 19, 1991.

6. On March 15, 1993, Respondents provided satisfactory evidence that LDR hazardous waste containers at TA-54 Area L have been properly marked.

7. On March 15, 1993, Respondents provided satisfactory evidence that all individuals identified by NMED have undertaken or will undertake necessary training.

B. **Supplemental Conclusions of Law.**

1. Respondents violated HWMR-6, § 301, incorporated federal regulations 40 CFR § 262.34(c)(1)(i) for failure to keep all hazardous waste containers closed at TA-21-4-4J, a satellite accumulation point.

2. Respondents violated HWMR-6, § 301, incorporated federal regulations 40 CFR § 262.34(c)(1)(ii) for failure to properly mark all hazardous waste containers at TA-35-213-A107A, TA-21-150-607, TA-21-4-4J, TA-3-38 (west side), TA-53-1-D115, and TA-59-1-113, which are satellite accumulation points.

C. Respondents do not admit any of NMED's findings of fact or conclusions of law except to the extent such facts or legal conclusions have been admitted in Respondents' answers to NMED's Compliance Orders filed on March 1, 1993. The parties agree that the terms and conditions of this Consent Agreement do not set a precedent for any future agreements that may be entered into

2242 1062

between NMED and DOE and/or the University.

VI. COMPROMISE AND SETTLEMENT OF COMPLIANCE ORDERS.

In compromise and settlement of violations alleged in the Compliance Orders and of penalties proposed in certain of the Compliance Orders, and without any admission of liability, Respondents agree as follows:

A. Remedial Action.

Pursuant to the terms of this Consent Agreement, Respondents agree to retrieve all mixed waste stored in pads 1, 2, and 4 at Technical Area 54, Area G at LANL, and to place such wastes into storage meeting all applicable requirements of the New Mexico Hazardous Waste Act and Regulations. Respondents will carry out these activities in accordance with the Remedial Action Plan, Attachment "B" to this Consent Agreement, and the Compliance Schedule, Attachment "C" to this Consent Agreement.

Pursuant to direction from DOE, the Center for Risk Management, Oak Ridge National Laboratory, is conducting an assessment of the risks associated with existing TRU-Waste storage configurations and the retrieval of stored TRU-Waste throughout the DOE complex, including TRU-Waste Pads 1, 2, and 4, TA-54, Area G, at LANL. The final report resulting from this study as it relates to LANL is expected to be completed by April 1, 1994. The final report will provide information regarding the health and safety and environmental effects of waste storage and retrieval at TRU-Waste Pads 1, 2, and 4. If, based on this new information, Respondents

2242 1063

conclude that certain changes in the method and timing of waste retrieval described in the Remedial Action Plan and Compliance Schedule of this Consent Agreement are required to insure adequate worker safety and protection of the environment, NMED agrees to meet and discuss with Respondents an amendment, if necessary, of this Consent Agreement to incorporate any revisions to the Remedial Action Plan and Compliance Schedule that the Secretary in her sole discretion deems necessary to insure adequate worker safety and protection of the environment. Prior to the issuance of her final decision, the Secretary agrees to provide Respondents in writing her proposed final decision. Respondents shall have fourteen (14) days thereafter to provide NMED and the Secretary written and any oral comments on the proposed final decision. At the end of this fourteen (14) day period, the Secretary shall issue her final decision.

B. **Civil Penalties.**

The University, on behalf of Respondents, shall make payment of a total sum to the State of New Mexico of seven hundred thousand dollars ($700,000.00). This sum is due and payable as follows: five hundred thousand dollars ($500,000.00) within thirty (30) days of the University's receipt of the Secretary's final order approving this Consent Agreement; two hundred thousand dollars ($200,000.00) on or before the last day of federal fiscal year 1994. Respondents represent that adequate funds or appropriations have been made and are available to cover this payment within the time frame set forth above. These payments shall be made to the

2242 1064

State of New Mexico Hazardous Waste Emergency Fund by certified check, bank draft or other guaranteed negotiable instrument and mailed or hand-delivered to the New Mexico Environment Department, Office of General Counsel, Attention: Linda Romero, 1190 St. Francis Drive, Room N4084, Post Office Box 26110, Santa Fe, New Mexico 87502.

VII. STIPULATED PENALTIES.

A. General.

If Respondents or either of them fail to comply with the performance requirements of this Consent Agreement, or fail to mail or hand-deliver a deliverable on or before its due date as set forth in this Consent Agreement, they shall be liable, jointly and severally, for stipulated penalties as follows:

1. ***Failure to timely submit any deliverable.***

$1,000.00 per day for each deliverable not received by NMED on or before its due date, from the 1st to 14th day following the due date, and $2,500.00 per day thereafter.

2. ***Failure to complete any remediation activities in accordance with the Compliance Schedule.***

$2,500.00 per day for each action not completed by a due date as set forth in this Consent Agreement, from the 1st to 14th day following the due date for completion, and $5,000.00 per day thereafter.

B. Payment and payment procedures.

Stipulated penalties shall begin to accrue upon the passing of a due date without performance unless an extension of

2242 1065

time to perform has been requested and granted by NMED prior to the expiration of the due date, in accordance with Section XV. Penalties shall continue to accrue as set forth above until Respondents cure their noncompliance. The Secretary shall confirm in writing that noncompliance was cured. Upon service of such written confirmation, penalties shall be deemed to be immediately due and payable in full. No separate written demand for payment from NMED shall be necessary. Payment shall be made by check, draft or other negotiable instrument made payable to the State of New Mexico Hazardous Waste Management Fund and mailed or hand-delivered to the New Mexico Environment Department, Office of General Counsel, Attention: Linda Romero, 1190 St. Francis Drive, Room N4084, Post Office Box 26110, Santa Fe, New Mexico 87502. Penalty payments not tendered within thirty (30) days after receipt by Respondents of the Secretary's letter confirming cure of noncompliance shall begin to accrue interest at the rate established by the United States Secretary of the Treasury pursuant to Section 2 of the federal Contract Dispute Act of 1978 (P.L. 95-563) and applicable at the time of the noncompliance and as fixed by the Secretary of the Treasury thereafter until paid in full. Nothing herein shall preclude the simultaneous or overlapping assessment of separate stipulated penalties for separate instances of noncompliance with due dates. This section shall be subject to Section XI. Although the obligation to pay stipulated penalties shall be stayed in the event a penalty is disputed under the provisions of this section or in any other forum, accrual of

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penalties shall continue until noncompliance has been cured as set forth above.

VIII. INTERIM STATUS.

With the exception of any new construction required to take place under this Consent Agreement, and solely for purposes of this Consent Agreement, NMED agrees that Respondents may perform the actions set forth and agreed to herein as if they had interim status under state or federal law. NMED does not admit, nor shall this Consent Agreement or any of its terms or conditions be construed or interpreted as an admission by NMED, that Respondents have met all state or federal statutory and regulatory requirements necessary to achieve interim status under state and federal law. For all new construction or modifications required under this Consent Agreement, Respondents shall apply for and obtain all permits required under state and federal law in accordance with Section XVII.

IX. DOCUMENTS, INFORMATION AND REPORTING REQUIREMENTS.

A. Exchange of Information.

Respondents agree to cooperate fully with NMED in providing requested data and information. Respondents agree to freely and routinely communicate with NMED concerning the status and progress of the project. No such communications shall alter or waive any rights or obligations of the Respondents under this Consent Agreement. No guidance, suggestions or comments by NMED shall be

2242 1067

construed as relieving Respondents of their obligation to obtain formal approval where such approval is required by this Consent Agreement. Respondents are encouraged to confer with NMED at any time prior to submission of any proposals, plans, studies, reports or other documents required by this Consent Agreement.

B. **Records Inspection and Copying.**

Respondents shall permit NMED, its contractors, designees and agents to inspect and copy all records, files, photographs, documents, and other writings, including all sampling and monitoring data, in any way pertaining to work undertaken pursuant to this Consent Agreement.

C. **Reporting Requirements.**

Throughout the course of activities performed pursuant to this Consent Agreement, Respondents shall submit quarterly, written progress reports to NMED. These progress reports shall include, at a minimum, the following:

1. a brief description of activities completed during the reporting period to implement the requirements of this Consent Agreement;

2. a brief description of activities scheduled for the following reporting period;

3. a description of any change in key project personnel which occurred during the reporting period;

4. a description of problems encountered during the reporting period and mechanisms used or proposed for resolving the problems;

5. tables and figures summarizing all data, sampling, and test results for the period.

Respondents shall furnish such progress reports to NMED as soon as possible and in no event later than the 15th day of

2242 1068

February, May, August, and November of each year this Consent Agreement remains in effect. The first progress report shall be due within sixty (60) days after the Secretary signs a final order approving this Consent Agreement. Subsequent reports shall be due as set forth above, unless the fifteenth day of a given month falls on a weekend day or a state or federal holiday, in which case the due date for the report shall be the next business day.

D. **Atomic Energy Act Requirements.**

All requirements of the Atomic Energy Act of 1954 and all applicable Executive Orders concerning the handling of unclassified controlled nuclear information, restricted data, and national security information including "need to know" requirements shall be applicable to any access to information furnished pursuant to this Consent Agreement. Respondents shall clearly identify all such documents.

X. **SITE ACCESS.**

A. Respondents shall at all reasonable times afford NMED, its contractors, designees and agents, unrestricted access to the Site, with or without prior notice. Respondents shall provide an authorized representative to accompany NMED's employees or contractors while at the Site.

B. NMED, its contractors, designees and agents shall abide by Respondents' safety requirements and procedures for access to and while at the Site.

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XI. **RESOLUTION OF DISPUTES/ENFORCEMENT.**

A. **General.** Except as to matters over which NMED or the Secretary may exercise sole discretion under this Consent Agreement, any dispute as to the obligations of this Consent Agreement shall first be subject to this Section. Matters contained within this Consent Agreement over which NMED or the Secretary may exercise sole discretion shall not be challengeable through this Section. As to matters for which it may be invoked, the dispute resolution procedures of this Section shall be followed and exhausted before pursuing any other legal remedy in any other forum. Exchange of documents under this Section shall be in accordance with Section XIV. For purposes of this Section only, the term **days** shall mean work days.

B. **Informal resolution.** Any dispute subject to this Section shall in the first instance be the subject of informal negotiation between NMED and the Respondents. The period for informal negotiation shall not exceed twenty (20) days from the time the disputing party notifies the other parties in writing that it wishes to commence informal dispute resolution, unless an extension of time is requested in writing within the prescribed twenty-day time and agreed to by NMED. The parties shall meet and confer as necessary to attempt to resolve the dispute within the twenty-day informal resolution period.

C. **Formal Resolution by Technical Group.**

1. *Composition.* The Technical Group shall consist of the LANL Environmental Protection (EM-8) Group Leader for the

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University, and the Los Alamos Area Office Environment, Safety and Health Branch Chief for DOE, and the Bureau Chief of the Hazardous and Radioactive Materials Bureau and a designated staff person of that Bureau for NMED.

2. *Invoking formal procedure.* In the event that the parties cannot resolve a dispute by informal negotiation, then the disputing party may invoke formal dispute resolution by submitting to the other parties and the members of the Technical Group a written Statement of Position on the matter in dispute, including, but not limited to any factual data, analysis, opinion, or documentation supporting its position.

3. *Responses.* Within fifteen (15) days of receipt of the disputing party's Statement of Position, the responding parties shall submit to the disputing party and the members of the Technical Group their Statement(s) of Position, including but not limited to any factual data, analysis, opinion, or documentation supporting that position.

4. *Technical Group Resolution.* After receipt of the responding parties' Statement(s) of Position, the Technical Group shall have fifteen (15) days to resolve the dispute.

D. **Formal Resolution by Advisory Group.**

1. The Advisory Group shall consist of the Area Manager for DOE's Los Alamos Area Office, the LANL Division Director of Quality, Environment, Safety and Health Assurance for the University, the Deputy Secretary of NMED and the Director of the Water and Waste Management Division for NMED.

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2. In the event the Technical Group has been unable to resolve the dispute within the time prescribed, the disputing party shall, within fifteen days after such period, submit to the members of the Advisory Group copies of all documents furnished to the Technical Group.

3. *Advisory Group Resolution.* After receipt of this documentation, the Advisory Group shall have fifteen (15) days to resolve the dispute.

E. **Final Decision by the Secretary.** In the event the Advisory Group has been unable to resolve the dispute within the time prescribed, the disputing party shall submit a written Request for Final Decision to the Secretary. The written request shall be accompanied by all documentation furnished to the Technical and Advisory Groups. Within thirty (30) days of receipt of the written Request for Final Decision, the Secretary shall issue a final decision, including a written statement of the reasons for the decision. The Secretary's decision shall be binding upon the parties unless timely appeal is taken.

F. **Extension of Time for Formal Dispute Resolution.**

If, during the formal dispute resolution process, it appears that resolution may be achieved by an extension of time, the Technical Group may petition the NMED member of the Advisory Group, and the Advisory Group may petition the Secretary for an extension of time in which to resolve the dispute.

G. **Effect of Dispute Resolution on Respondents' Obligations.**

The Respondents' obligations under this Consent Agreement are

2242 1072

not waived by the invocation of this dispute resolution process. The performance of such obligations may, in the discretion of the Respondents be suspended until conclusion of the dispute resolution process of this Section. The accrual of stipulated penalties for obligations Respondents elect to suspend shall not be stayed during the pendency of any dispute under this Section, unless an extension of the performance due date for the disputed obligation has been granted by NMED pursuant to Section XV.

H. **Incorporation by amendment.** Upon resolution of a dispute pursuant to this Section, the resolution shall be incorporated into this Consent Agreement by appropriate amendment.

XII. **COURT JURISDICTION/VENUE.**

The parties shall endeavor to bring and maintain all actions arising out of this Consent Agreement in the New Mexico First Judicial District Court, the New Mexico Court of Appeals, or in the United States District Court for the District of New Mexico.

XIII. **COMPUTATION OF TIME.**

In computing any period of time prescribed in this Consent Agreement, the day of the act, event, requirement or noncompliance from which the designated period of time begins to run shall not be included. Except as to penalties which could accrue under Section VII.A.2., the last day of the period so computed shall be included, unless it is a Saturday, Sunday or federal or State of New Mexico holiday, in which event the period runs until the end of the next

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day which is not a Saturday, Sunday or holiday.

XIV. **EXCHANGE OF DOCUMENTS.**

A. Whenever the terms of this Consent Agreement require exchanges of documents, such exchanges shall be made by mail, by facsimile if followed within twenty-four (24) hours by a mailed copy, or by hand-delivery to the individuals at the addresses below, unless those individuals or their successors give notice in writing to the other Parties of a change in designated recipient or address. Exchanges of documents required under this Consent Agreement shall be complete upon mailing or upon hand-delivery to a designated representative of the individuals listed below:

For NMED:

BENITO GARCIA, Bureau Chief
NMED Hazardous & Radioactive Materials Bureau
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502
(505) 827-4358
(505) 827-2836 (fax)

For the U.S. Department of Energy:

Jon Mack, Environmental Engineer
Environment, Safety and Health Branch
Department of Energy
Los Alamos Area Office
528 35th St.
Los Alamos, N.M. 87544
(505) 665-5026
(505) 665-4504 (fax)

For the University of California:

John Krueger, Section Leader
Los Alamos National Laboratory
EM-7, MS-J595

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Los Alamos, N.M. 87545
(505) 665-8467
(505) 665-8347 (fax)

For the Technical Group:

BENITO GARCIA, Bureau Chief
NMED Hazardous & Radioactive Materials Bureau
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502
(505) 827-4358
(505) 827-2836 (fax)

For LANL:

Kenneth Hargis, Group Leader
Environmental Protection
LANL EM-8, MS-K490
Los Alamos, N.M. 87545
(505) 667-5021
(505) 667-0486 (fax)

For DOE:

Joe Vozella, Chief
Environmental Safety and Health Branch
DOE Los Alamos Area Office
528 35th St.
Los Alamos, N.M. 87544
(505) 667-5288
(505) 665-4504 (fax)

For the Advisory Group:

Division Director
NMED Water & Waste Management Division
Office of the Secretary
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502
(505) 827-2836 (fax)

Deputy Secretary
New Mexico Environment Department
Office of the Secretary
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502
(505) 827-2850

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(505) 827-2836 (fax)

Jerry L. Bellows
DOE Los Alamos Area Manager
DOE Los Alamos Area Office
528 35th St.
Los Alamos, N.M. 87544
(505) 667-5105
(505) 665-4873 (fax)

Dennis J. Erickson
Quality, Environment, Safety and Health Assurance Division
LANL MS-K491
Los Alamos, N.M. 87545
(505) 667-4218
(505) 665-3811 (fax)

XV. **TIME FRAMES; EXTENSIONS;** ***FORCE MAJEURE.***

A. **Extensions for Good Cause.**

Before the due dates for performance of obligations or delivery of documents as set forth in this Consent Agreement, and for good cause shown, due dates may be extended with the written permission of the Secretary as follows:

1. ***Extensions of more than 30 days.*** Any request for extension of 30 days or more shall be made in writing and received by NMED at least 30 days prior to the due date for which the extension is sought. The Secretary shall approve or deny the request in writing within 21 days after receipt of the extension request.

2. ***Extensions of less than 30 days.*** Any request for extension of less than 30 days shall be made in writing and received by NMED at least 7 days prior to the due date. The Secretary shall approve or deny the request before the due date either in writing or orally with written confirmation within 24

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hours.

3. *Requests for extension; required content.* All requests for extension claiming good cause shall include:

a. the due date sought to be extended;

b. the length of the extension sought;

c. the good cause(s) alleged to support the requested extension;

d. a description of all related due dates that may be affected if the extension is granted.

4. The grant or denial of a request for extension of a due date based upon good cause shall be within the sole discretion of the Secretary.

B. **Extensions for *Force Majeure*.** Respondents agree to implement this Consent Agreement in accordance with the schedules set forth herein. Respondents further agree to adopt all reasonable measures including contractual arrangements with third parties to avoid and minimize any delays in the implementation of this Consent Agreement.

1. ***Claiming force majeure.*** To claim *force majeure* Respondents shall give prompt oral notification to NMED within forty-eight (48) hours after the event, with written confirmation within 24 hours. No claim of *force majeure* shall be made after the expiration of a due date claimed to be affected.

2. ***Required content of written notice.*** All written notifications of *force majeure* shall include:

a. a description of the event claimed to

2242 1077

constitute *force majeure*;

b. an estimate of the anticipated length of delay;

c. a description of all related due dates that may be affected, and;

d. the length of the extension sought and a plan of corrective action and, if applicable, of proposed measures to prevent recurrence.

3. ***NMED acknowledgement.*** NMED shall, within 7 days after receipt of a notification of *force majeure* but in no event later than the affected due date, accept or deny in writing Respondents' claim of *force majeure*. NMED's written acceptance of *force majeure* shall include a grant of the requested extension, or of a different period of extension deemed reasonable under the circumstances. NMED denial of Respondents' claim of *force majeure* shall be subject to the dispute resolution procedures of Section XI.

C. **Extensions due to delays by NMED.** In the event NMED fails to meet a due date for which it is responsible in the Compliance Schedule, all due dates subsequent to that NMED due date shall be extended by a period of time equal to the number of days between the NMED due date specified in the Compliance Schedule and the date NMED actually completes the action.

D. **Waiver.** Unless Respondents have timely requested an extension for good cause or timely notified NMED of a claim of *force majeure*, failure of Respondents to timely submit a deliverable or complete an activity shall constitute a waiver of

2242 1078

any right to dispute the due dates for such obligations. No extension of time, deferral, grant, or waiver by NMED or the Secretary as provided in this Consent Agreement shall be construed as waiver or authorization for any other delays, defaults or omissions.

XVI. **TERMINATION.**

A. **Generally.** This Consent Agreement shall terminate upon satisfactory completion by Respondents of all obligations under this Consent Agreement as determined in accordance with this Section:

1. *Certification of Completion.* When Respondents determine that they have completed all the obligations of this Consent Agreement they shall submit to NMED a Request for Certification of Completion. NMED shall evaluate the request by performing an on-site inspection and reviewing all relevant documents and data. Within 90 days after receipt of Respondents' Request for Certification of Completion, NMED shall either issue a written Certification of Completion or deny the request. If NMED denies the Request for Certification of Completion, its denial shall describe all remaining obligations deemed to be incomplete. This Consent Agreement shall terminate upon the issuance of NMED's written Certification of Completion.

B. **Termination by NMED.** The Secretary in her sole discretion reserves the right to terminate this Consent Agreement by written notice to the Respondents if the Secretary at any time

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determines that for any reason whatsoever the obligations of the Consent Agreement are not being satisfactorily met or are not being met in accordance with the terms of this Consent Agreement.

XVII. COMPLIANCE WITH APPLICABLE LAW.

A. Generally.

All activities required by this Consent Agreement shall be undertaken in compliance with the requirements of all applicable federal, state, and local laws, regulations, and ordinances. Nothing in this Consent Agreement shall be construed as relieving Respondents of any liability under, or obligation to comply with applicable laws.

B. **Anti-Deficiency Act.** It is Respondents' position that any requirement for payment or obligation of funds by Respondents established by this Consent Agreement shall be subject to the federal Anti-Deficiency Act, 31 U.S.C. Section 1341. It is NMED's position that the federal Anti-Deficiency Act does not apply to the obligations described in this Consent Agreement. NMED believes that the obligations of this Consent Agreement, including the obligation to pay stipulated penalties when properly assessed, are joint and several and unaffected by DOE's failure to obtain adequate funds or appropriations from Congress. The parties agree that failure to obtain adequate funds or appropriations from Congress does not, in any way, release Respondents from their obligation to comply with RCRA and applicable State hazardous waste laws and requirements.

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C. **Permits.** This Consent Agreement is not, and shall not be construed to be, a permit issued pursuant to any federal or state statute or regulation. Where any portion of the work requires a federal or state permit or approval for new construction, modifications or otherwise, Respondents shall submit timely and complete applications and take all other actions necessary to obtain all such permits or approvals. Respondents agree to act with due diligence and in good faith in seeking all legal permissions and permits which may from time to time be required in order to comply with this Consent Agreement. The failure to submit a timely and technically complete permit application required for any work to be conducted pursuant to this Consent Agreement shall bar any claims for *force majeure* alleging inability to obtain a permit, and shall constitute grounds for denial of a request for extension of a due date for the work based upon good cause as set forth in Section XV.

XVIII. **HOLD HARMLESS CLAUSE.**

Neither NMED nor its agents, employees or contractors shall be liable to Respondents or third parties for any injuries or damages, whether contractual, tortious or otherwise in nature, which arise directly or indirectly out of, or result directly or indirectly from, the actions required of Respondents under this Consent Agreement. Neither NMED nor its agents, employees or contractors shall be held out as a party to any contract, agreement or understanding entered into by the Respondents in carrying out the

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obligations of this Consent Agreement. Specifically and without limitation, neither NMED nor its agents, employees or contractors shall be liable to Respondents or third parties for termination of this Consent Agreement by the Secretary.

XIX. **GOOD FAITH PERFORMANCE.**

The parties agree that they will act reasonably and in good faith at all times to accomplish the objectives of this Consent Agreement. Respondents agree to perform all evaluations and actions required by this Consent Agreement using sound scientific judgment. It is the expectation of the parties that all obligations of Respondents imposed under this Consent Agreement will be fully funded by DOE. DOE shall take all necessary steps and use its best efforts to obtain timely and sufficient funding to meet Respondents' obligations under this Consent Agreement, including without limitation, submission of timely budget requests.

XX. **TIME OF THE ESSENCE.**

The Parties understand and agree that time is of the essence in accomplishing the goals and objectives of this Consent Agreement even when no specific time frame or due date has been specified.

XXI. **AMENDMENTS.**

This Consent Agreement may be amended only by agreement of the Parties. Such amendments shall be in writing, signed by the Parties and subject to the approval of the Secretary, and shall

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become effective upon written approval of the Secretary. Amendments to the Remedial Action Plan may be agreed upon and signed by the Technical Advisory Group, subject to the written approval of the Secretary.

XXII. **COVENANT NOT TO SUE.**

NMED agrees that as long as Respondents remain in compliance with the terms and conditions of this Consent Agreement, NMED will not initiate or pursue civil or administrative relief in any other forum which might otherwise be available under New Mexico and federal law, including without limitation the right to seek and recover damages or penalties against Respondents, their successors, assigns and employees for the allegations set forth herein or for the actions required to be performed under this Consent Agreement.

XXIII. **RIGHTS EXPRESSLY RESERVED/ENFORCEMENT.**

A. **Reservation of rights.** NMED reserves the right to pursue civil or administrative relief for any other violations of state or federal law, past or future, which are not the subject matter of this Consent Agreement. NMED reserves the right to take emergency response action at property owned or controlled by Respondents in the event conditions pose an imminent and substantial endangerment to human health or the environment. NMED specifically retains the right to conduct other environmental studies, investigations, monitoring, or emergency activities at property owned or controlled by Respondents, and to enforce all laws, statutes and regulations

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NMED is authorized to enforce. NMED's failure to exercise any power, authority, or right in this Consent Agreement, or its election not to exercise such power, authority or right, shall not be construed as a waiver or relinquishment of such power, authority or right at other times or under other circumstances.

B. **Enforcement.** In the event Respondents fail to perform any obligations under this Consent Agreement, including those that have not been resolved pursuant to the dispute resolution mechanism under Section XI, this Consent Agreement shall be enforceable by NMED by the filing of a civil action either in the New Mexico District Court for Santa Fe County or in the United States District Court for the District of New Mexico.

XXIV. **COSTS AND FEES.**

Each party shall bear its own costs and fees arising out of this Consent Agreement. Respondents shall arrange and pay for any transcripts required or agreed to be made under the provisions of this Consent Agreement.

XXV. **SEVERABILITY.**

The provisions of this Consent Agreement are severable. If any provision of this Consent Agreement is declared by a court of law to be invalid or unenforceable, all other provisions of this Consent Agreement shall remain in full force and effect, unless NMED in its sole discretion determines that the objectives of this Consent Agreement are substantially impaired by the court's ruling.

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In that event, NMED may, in its sole discretion, elect to terminate this Consent Agreement by so notifying the Respondents in writing signed by the Secretary.

XXVI. **DELEGATION.**

Except with respect to final orders or decisions to terminate this Consent Agreement, and other matters committed to the sole discretion or decision of the Secretary, NMED's powers and authorities under this Consent Agreement shall be exercised by its Deputy Secretary, its Division Director for the Water and Waste Management Division, and the Bureau Chief for the Hazardous and Radioactive Materials Bureau as set forth herein or if not set forth in this Consent Agreement, as determined and allocated amongst them.

XXVII. **MERGER & INTEGRATION.**

This Consent Agreement merges all prior written and oral communications between the parties concerning this matter, and contains the entire agreement reached between the parties. This Consent Agreement shall not be altered, amended or construed by any communications whether written or oral, which are not contained herein. This Consent Agreement may only be amended in accordance with Section XXI.

XXVIII. **EFFECTIVE DATE.**

This Consent Agreement is effective on the day on which the

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Secretary signs a final order approving it.

XXIX. **AUTHORITY OF SIGNATORY.**

The persons executing this Consent Agreement respectively represent that they have the requisite authority to bind the U.S. Department of Energy, the University of California, and the New Mexico Environment Department to the terms of this Consent Agreement, and further agree that this representation of authority as to each such entity shall be legally sufficient evidence of actual or apparent authority to bind each of them to all of the terms and conditions of this Consent Agreement.

APPROVED:

Kathleen M. Sisneros

Kathleen Sisneros, on behalf of the
New Mexico Environment Department

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APPROVED:

Jerry L. Bellows

on behalf of the United States
Department of Energy

APPROVED:

on behalf of the Regents of
the University of California

APPROVED AS TO FORM:

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STATE OF NEW MEXICO
ENVIRONMENT DEPARTMENT

IN THE MATTER OF
THE REGENTS OF THE UNIVERSITY OF CALIFORNIA
LOS ALAMOS NATIONAL LABORATORY
LOS ALAMOS, NEW MEXICO
ID. NO. NM0890010515

RESPONDENT.

COMPLIANCE ORDER
NMHWA 93-04

ADMINISTRATIVE ORDER REQUIRING COMPLIANCE
AND PROPOSING TO ASSESS A CIVIL PENALTY

This Administrative Order (Order) is issued to the Regents of the University of California (Respondent) pursuant to the New Mexico Hazardous Waste Act (HWA), § 74-4-10 NMSA 1978. The authority to issue this Order has been delegated by the Secretary of the New Mexico Environment Department (NMED) to the Director of the Water and Waste Management Division (Complainant).

FINDINGS

1. Respondent is the Regents of the University of California.

2. Respondent is the management and operating contractor for the Los Alamos National Laboratory (LANL) pursuant to a contract with the U.S. Department of Energy (DOE), and is a co-operator of LANL. The United States, acting through DOE, is the owner and co-operator of LANL.

3. LANL is located principally in Los Alamos County, New Mexico, approximately sixty (60) miles northeast of Albuquerque and twenty-five (25) miles northwest of Santa Fe. The LANL site encompasses approximately forty-three (43) square miles.

4. LANL was chosen in 1942 as the site for the wartime development of the atomic bomb. The area was established as a military reservation, and operations began in 1943. Since 1943, the primary mission of LANL has been nuclear weapons research and development. In addition, the facility does work in magnetic and inertial fusion, nuclear fission, nuclear safeguards and security, laser isotope separation, and medical isotope development.

5. In association with the activities identified above, LANL generates, stores, and disposes of hazardous wastes and mixed hazardous and radioactive wastes.

6. On May 4-8, 1992, NMED employees Coby Muckelroy, Ernest Preciado, John Tymkowych, and Michael LeScouarnec (NMED inspectors) conducted a hazardous waste inspection at LANL (inspection).

7. TA-54 Area G Dome #48, at LANL, is a hazardous waste storage area.

8. Respondent's inspection logs for TA-54 Area G Dome #48 document that, from January 21, 1991 to July 8, 1991, varying numbers of hazardous waste drums, up to twenty-six (26) at one time, were leaking.

9. During this period, hazardous waste in these drums was not transferred to containers that are in good condition.

10. TA-3-39, TA-55-191 (outside storage shed), TA-3-40, TA-3-29-5012, and TA-35-85, at LANL, are "less than ninety (90) day" hazardous waste storage areas.

11. At the time of the NMED inspection, storage at the following areas exceeded ninety (90) days:

a. TA-3-39 -- two (2) drums of hazardous waste, dated September 19, 1991 and November 20, 1991, respectively
b. TA-55-191 (outside storage shed) -- two (2) drums of hazardous waste, dated September 2, 1991, and October 18, 1991, respectively
c. TA-3-40 -- hazardous waste storage tank, stored since August 1991

12. Additionally, at the time of the NMED inspection, a container of hazardous waste at the TA-35-85 area was found to be open.

13. Additionally, at the time of the NMED inspection, the following hazardous waste storage units were not labeled or marked clearly with the words "Hazardous Waste":

a. TA-3-40 -- storage tank
b. TA-3-29-5012 -- two (2) drums of lead-contaminated hazardous waste

14. TA-35-213-A107A, TA-21-150-607, TA-21-4-4J, TA-3-38 (west side), TA-53-1-D115, TA-59-1-113, and TA-59-1-116, at LANL, are hazardous waste "satellite accumulation points".

15. At the time of the NMED inspection, at least one container of hazardous waste at the TA-21-4-4J area was found to be open.

16. Additionally, at the time of the NMED inspection, at least one container of hazardous waste at each the following areas was not labeled or marked clearly with the words "Hazardous Waste":

a. TA-35-213-A107A
b. TA-21-150-607
c. TA-21-4-4J
d. TA-3-38 (west side)
e. TA-53-1-D115
f. TA-59-1-113

17. Additionally, at the time of the inspection, hazardous waste from a different site of origination was found at the TA-59-1-116 area.

18. TA-54 Area L, at LANL, is a hazardous waste storage area.

19. At the time of the inspection, shower and eye wash devices were not located within one hundred (100) feet of the mixed waste and waste gas cylinder storage areas at TA-54 Area L.

20. At the time of the inspection, Respondent failed to provide documentation that three (3) of Respondent's employees had completed required training.

21. At the time of the inspection, Respondent failed to provide the original manifest copy with the offsite facility's signature for the following shipments of hazardous waste: (a) shipment of September 26, 1991 (manifest document # 91212); and (b) shipment of September 19, 1991 (manifest documents ## 91193 - 91197).

22. Upon information and belief, Respondent had not received copies of the manifests referred to in ¶ 21 above with the handwritten signatures of the owner or operator of the designated facility within forty-five (45) days of the date the waste was accepted by the initial transporter.

23. Respondent did not submit Exception Reports to NMED regarding the manifests referred to in ¶¶ 21 and 22 above within forty-five (45) days of the date the waste was accepted by the initial transporter.

24. At the time of the inspection, at least three (3) drums of mixed waste stored at TA-54 Area L containing hazardous waste restricted from land disposal (LDR waste) were not clearly marked to identify their contents.

CONCLUSIONS

25. Respondent is a "person" as defined at § 74-4-3.K. of HWA, and HWMR-6, § 101, incorporated federal regulations 40 CFR § 260.10.

26. Respondent has "hazardous waste" at its facility as that term is defined at § 74-4-3.I. of HWA, and HWMR-6, § 101, incorporated federal regulations 40 CFR § 260.10.

27. Respondent has waste at its facility which is referred to as mixed waste which is defined as waste which contains a hazardous waste component regulated under Subtitle C of the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §§ 6921 to 6939b, and the HWA; and a radioactive component consisting of source, special nuclear, or byproduct material regulated under the federal Atomic Energy Act (AEA).

28. Respondent is a "generator" of hazardous waste as defined at § 74-4-3.F. of HWA, and HWMR-6, § 101, incorporated federal regulations 40 CFR § 260.10.

29. Respondent engages in the "treatment", "storage" or "disposal" of hazardous waste as those terms are defined at § 74-4-3.Q., N., and C. of HWA, and HWMR-6, § 101, incorporated federal regulations 40 CFR § 260.10. Storage occurs in "containers" and

"tanks" as those terms are defined at HWMR-6, § 101, incorporated federal regulations 40 CFR § 260.10.

30. Respondent is an "operator" of an "existing hazardous waste management facility" as those terms are defined in HWMR-6, § 101, incorporated federal regulations 40 CFR § 260.10.

31. Certain of Respondent's mixed waste management units may not have "interim status" as legally determined under HWMR-6, § 901, incorporated federal regulations 40 CFR Part 270, and are not operating under a permit. HWMR-6, § 601, incorporated federal regulations 40 CFR Part 265, governs waste management units that have interim status; HWMR-6, § 501, incorporated federal regulations 40 CFR Part 264, governs waste management units which are permitted or which do not have interim status. Complainant does not at this time and for purposes of this Order need to make a final determination of which Part these waste management units are regulated under.

32. HWMR-6, § 301, incorporated federal regulations 40 CFR § 262.10(a) makes the regulations in Part 262 (Standards Applicable to Generators of Hazardous Waste), applicable to Respondent. HWMR-6, § 601, incorporated federal regulations 40 CFR § 265.1(b) makes the regulations in Part 265 (Interim Status Standards For Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities), applicable to Respondent. Alternatively, HWMR-6, § 501, incorporated federal regulations 40 CFR § 264.1(b) makes the regulations in Part 264 (Standards For Owners and Operators of Hazardous Waste Treatment), applicable to Respondent. HWMR-6, §

801, incorporated federal regulations 40 CFR § 268.1(b) makes the regulations in Part 268 (Land Disposal Restrictions), applicable to Respondent.

33. Assuming Respondent is otherwise allowed to store LDR (land disposal restriction) waste, HWMR-6, § 801, incorporated federal regulations 40 CFR § 268.50(a)(2)(i) requires Respondent to do so only so long as the container is clearly marked to identify its contents and the date each period of accumulation begins.

34. HWMR-6, § 601, incorporated federal regulations 40 CFR § 265.171 requires Respondent to transfer the hazardous waste found in a container that is not in good condition, or that is beginning to leak, to a container that is in good condition or manage the waste in some other way that complies with the requirements of Part 265. Alternatively, HWMR-6, § 501, incorporated federal regulations 40 CFR § 264.171 requires Respondent to transfer the hazardous waste found in containers that are not in good condition, or that are beginning to leak, to containers that are in good condition or manage the waste in some other way that complies with the requirements of Part 264.

35. HWMR-6, § 301, incorporated federal regulations 40 CFR § 262.34(a) prohibits Respondent from storing waste at less than ninety (90) day storage areas beyond ninety (90) days.

36. HWMR-6, § 301, incorporated federal regulations 40 CFR § 262.34(a)(1) requires Respondent to keep all containers closed at less than ninety (90) day storage areas.

37. HWMR-6, § 301, incorporated federal regulations 40 CFR § 262.34(a)(3) requires Respondent to label all containers at less than ninety (90) day storage areas.

38. HWMR-6, § 301, incorporated federal regulations 40 CFR § 262.34(a)(1) requires Respondent to keep all containers closed at satellite accumulation points.

39. HWMR-6, § 301, incorporated federal regulations 40 CFR § 262.34(a)(3) requires Respondent to label all containers at satellite accumulation points.

40. HWMR-6, § 301, incorporated federal regulations 40 CFR § 262.34(c)(1) requires Respondent to keep waste under the control of the operator who is generating the waste.

41. HWMR-6, § 601, incorporated federal regulations 40 CFR § 265.32(c) requires Respondent to maintain decontamination equipment at all facilities, unless none of the hazards posed by waste handled at the facility could require this kind of equipment. Alternatively, HWMR-6, § 501, incorporated federal regulations 40 CFR § 264.32(c) requires Respondent to maintain decontamination equipment at all facilities, unless none of the hazards posed by waste handled at the facility could require this kind of equipment.

42. Respondent failed to maintain decontamination equipment at the mixed waste and waste gas cylinder storage areas at TA-54 Area L even though hazards posed by these wastes could require this kind of equipment.

43. HWMR-6, § 601, incorporated federal regulations 40 CFR § 265.16(d)(4) requires Respondent to maintain records at the

facility documenting that all facility personnel have received and completed required training or job experience. Alternatively, HWMR-6, § 501, incorporated federal regulations 40 CFR § 264.16(d)(4) requires Respondent to maintain records at the facility documenting that all facility personnel have received and completed required training or job experience.

44. HWMR-6, § 301, incorporated federal regulations 40 CFR § 262.42 requires Respondent to submit an Exception Report to NMED if Respondent has not received a copy of a shipment manifest with the handwritten signature of the owner or operator of the designated facility within forty-five (45) days of the date the waste was accepted by the initial transporter.

COUNT 1: FAILURE TO TRANSFER CONTENTS/TA-54 AREA G DOME #48

45. Paragraphs 1-9, 25-27, 29-32, and 34 are hereby incorporated by reference.

46. Respondent is in violation of HWMR-6, § 601, incorporated federal regulations 40 CFR § 265.171 for failure to transfer hazardous waste found in containers that are not in good condition, or that are beginning to leak, to containers that are in good condition, or manage the waste in some other compliant manner, at TA-54 Area G Dome #48. Alternatively, Respondent is in violation of HWMR-6, § 501, incorporated federal regulations 40 CFR § 264.171 for failure to transfer the hazardous waste found in containers that are not in good condition, or that are beginning to leak, to containers that are in good condition, or manage the waste in some other compliant manner, at TA-54 Area G Dome #48.

COUNTS 2-4: STORAGE BEYOND 90 DAYS/3 LOCATIONS

47. Paragraphs 1-6, 10-11, 25-28, 32 and 35 are hereby incorporated by reference.

48. Respondent is in violation of HWMR-6, § 301, incorporated federal regulations 40 CFR § 262.34(a) for storing waste beyond ninety (90) days at TA-3-39, TA-55-191 (outside storage shed), and TA-3-40, which are less than ninety (90) day storage areas.

COUNT 5: OPEN CONTAINER/TA-35-85

49. Paragraphs 1-6, 10, 12, 25-28, 32, and 36 are hereby incorporated by reference.

50. Respondent is in violation of HWMR-6, § 301, incorporated federal regulations 40 CFR § 262.34(a)(1) for failure to keep all containers closed at TA-35-85, a less than ninety (90) day storage area.

COUNTS 6-7: IMPROPER LABELING/2 LOCATIONS

51. Paragraphs 1-6, 10, 13, 25-28, 32, and 37 are hereby incorporated by reference.

52. Respondent is in violation of HWMR-6, § 301, incorporated federal regulations 40 CFR § 262.34(a)(3) for failure to properly label all containers at TA-3-40 and TA-3-29-5012, which are less than ninety (90) day storage areas.

COUNT 8: OPEN CONTAINER/TA-21-4-4J

53. Paragraphs 1-6, 14-15, 25-28, 32, and 38 are hereby incorporated by reference.

54. Respondent is in violation of HWMR-6, § 301, incorporated federal regulations 40 CFR § 262.34(a)(1) for failure to keep all containers closed at TA-21-4-4J, a satellite accumulation point.

COUNTS 9-14: IMPROPER LABELING/6 LOCATIONS

55. Paragraphs 1-6, 14, 16, 25-28, 32, and 39 are hereby incorporated by reference.

56. Respondent is in violation of HWMR-6, § 301, incorporated federal regulations 40 CFR § 262.34(a)(3) for failure to properly label all containers at TA-35-213-A107A, TA-21-150-607, TA-21-4-4J, TA-3-38 (west side), TA-53-1-D115, and TA-59-1-113, which are satellite accumulation points.

COUNT 15: WASTE NOT AT SITE OF ORIGINATION

57. Paragraphs 1-6, 14, 17, 25-28, 32, and 40 are hereby incorporated by reference.

58. Respondent is in violation of HWMR-6, § 301, incorporated federal regulations 40 CFR § 262.34(c)(1) for failure to keep waste under the control of the operator who is generating the waste, i.e., waste found at TA-59-1-116, a satellite accumulation point.

COUNT 16: UNAVAILABILITY OF DECONTAMINATION EQUIPMENT

59. Paragraphs 1-6, 18-19, 25-27, 29-32, and 41-42 are hereby incorporated by reference.

60. Respondent is in violation of HWMR-6, § 601, incorporated federal regulations 40 CFR § 265.32(c) for failure to maintain necessary decontamination equipment at TA-54 Area L. Alternatively, Respondent is in violation of HWMR-6, § 501,

incorporated federal regulations 40 CFR § 264.32(c) for failure to maintain necessary decontamination equipment at TA-54 Area L.

COUNT 17: TRAINING DOCUMENTATION UNAVAILABLE

61. Paragraphs 1-6, 20, 25-27, 29-32, and 43 are hereby incorporated by reference.

62. Respondent is in violation of HWMR-6, § 601, incorporated federal regulations 40 CFR § 265.16(d)(4), alternatively, HWMR-6, § 501, incorporated federal regulations 40 CFR § 264.16(d)(4), for failure to maintain necessary personnel training documentation at the facility.

COUNTS 18-19: EXCEPTION REPORTS NOT FILED/2 REPORTS

63. Paragraphs 1-6, 21-23, 25-28, 32 and 44 are hereby incorporated by reference.

64. Respondent is in violation of HWMR-6, § 301, incorporated federal regulations 40 CFR § 262.42 for failure to submit Exception Reports to NMED within forty-five (45) days of hazardous waste shipments dated September 26, 1991 and September 19, 1991, because of the unavailability of original manifests signed by the offsite facility.

COUNT 20: IMPROPER LABELING/LAND DISPOSAL RESTRICTION WASTE

65. Paragraphs 1-6, 18, 24-27, and 29-33 are hereby incorporated by reference.

66. Respondent is in violation of HWMR-6, § 801, incorporated federal regulations 40 CFR §268.50(a)(2)(i) for failure to properly mark containers of LDR waste at TA-54 Area L.

CIVIL PENALTY

Section 74-4-10 of HWA authorizes the assessment of a civil penalty of up to ten thousand dollars ($10,000.00) per day for each violation of HWA and the regulations promulgated thereunder. Complainant hereby proposes to assess a civil penalty of three hundred fifty-two thousand six hundred five dollars ($352,605.00) against Respondent. The penalty is based on the seriousness of the violations and any good faith efforts on the part of Respondent to comply with the applicable requirements, and any economic benefit accruing to the Respondent, as well as such other matters as justice may require, and is calculated pursuant to the NMED's Civil Penalty Policy. The individual penalties for each violation are:

VIOLATION		AMOUNT
COUNT 1: FAILURE TRANSFER CONTENTS/TA-54 AREA G DOME #48		$121,750
COUNTS 2-4: STORAGE BEYOND 90 DAYS/3 LOCATIONS	(total)	$134,850
COUNT 5: OPEN CONTAINER/TA-35-85		$ 550
COUNT 6: IMPROPER LABELING/TA-3-29-5012		$ 625
COUNT 7: IMPROPER LABELING/TA-3-40		$ 5,100
COUNT 8: OPEN CONTAINER/TA-21-4-4J		$ 550
COUNTS 9-14: IMPROPER LABELING/6 LOCATIONS	(total)	$ 4,050
COUNT 15: WASTE NOT AT SITE OF ORIGINATION		$ 600
COUNT 16: UNAVAILABILITY OF DECONTAMINATION EQUIPMENT		$ 3,740
COUNT 17: TRAINING DOCUMENTATION UNAVAILABLE		$ 3,400
COUNTS 18-19: EXCEPTION REPORTS NOT FILED/2 REPORTS	(total)	$ 72,800
COUNT 20: IMPROPER LABELING/LDR WASTE		$ 4,590
	TOTAL:	$352,605.00

If you wish to contest the imposition of the penalty, see the soon following section entitled "Notice of Opportunity to Request a Hearing."

COMPLIANCE ORDER

NMED acknowledges receipt of the documentation contained in Jerry L. Bellows' (DOE) September 3, 1992 letter to Kathleen

Sisneros concerning the correction of certain of the violations cited in this Order. Based on the foregoing Findings and Conclusions, and the September 3rd documentation, Respondent is hereby ordered to immediately comply with the following schedule of compliance:

1. Within five (5) working days after receipt of this Order, submit documentation to NMED that Respondent has removed all hazardous waste stored at TA-3-40, or, alternatively, documentation that the waste stored there is not hazardous waste subject to the HWA.

2. Within five (5) working days after receipt of this Order, submit documentation to NMED that Respondent has properly labeled the hazardous waste container at TA-3-40, or, alternatively, documentation that the waste stored there is not hazardous waste subject to the HWA.

3. Within five (5) working days after receipt of this Order, submit documentation to NMED that Respondent has provided all necessary personnel training to whoever has not had such training, or, alternatively, if such training has not yet been completed, provide such training and documentation within ten (10) working days after receipt of this Order.

4. Within five (5) working days after receipt of this Order, submit copies of the original manifests signed by the offsite facility for the hazardous waste shipments dated September 26, 1991 and September 19, 1991.

5. Within five (5) working days after receipt of this Order, submit documentation to NMED that Respondent has properly labeled the LDR hazardous waste containers at TA-54 Area L.

NOTICE

If you fail to take the corrective actions within the times specified in the Order, the Secretary may assess a civil penalty of not more than twenty-five thousand dollars ($25,000.00) for each day of continued noncompliance with the Order, pursuant to the HWA, § 74-4-10.C.

NOTICE OF OPPORTUNITY TO ANSWER AND REQUEST A HEARING

Where Respondent (a) contests any material fact or legal matter upon which the Order is based; (b) contends that the amount of the penalty proposed in the Order is inappropriate; or (c) contends that Respondent is entitled to prevail as a matter of law, Respondent shall file a written Request for Hearing together with an Answer to the Order with the Hearing Clerk within thirty (30) days after service of the Order. The Answer must clearly and directly identify what specifically Respondent is appealing.

The Answer shall clearly and directly admit, deny, or explain each of the factual allegations contained in the Order with regard to which Respondent has any knowledge. Where the Respondent has no knowledge of a particular factual allegation and so states, the allegation is deemed denied. Failure of Respondent to admit, deny, or explain any material factual allegation contained in the Order constitutes an admission of the allegation.

The Answer shall also state: (1) the circumstances or arguments which are alleged to constitute the grounds of defense; (2) the facts which Respondent intends to place at issue; and (3) whether a hearing is requested.

A hearing upon the issues raised by the Order and Answer shall be held upon the request of the Respondent. The Respondent shall attach to the Answer a copy of the Compliance Order to which the Request for Hearing pertains.

The Hearing Clerk's address is:

Barbara Rivera, Acting Hearing Clerk
New Mexico Environment Department
Post Office Box 26110
1190 St. Francis Drive
Harold Runnels Building, S-4100
Santa Fe, NM 87502
(505) 827-2842

FINALITY OF ORDER

The Order shall become final unless Respondent files a written Request for Hearing with an Answer within thirty (30) days of service of this Order. For purposes of this action, failure by Respondent to file an Answer constitutes an admission of all facts alleged in the Order and a waiver of Respondent's right to a hearing under § 74-4-10 of HWA concerning such factual allegations. The proposed penalty shall become due and payable by Respondent without further proceedings sixty (60) days after Respondent's failure to file an Answer. Respondent must immediately comply with the Order provisions in this Order.

SETTLEMENT CONFERENCE

Whether or not Respondent requests a hearing, Respondent may confer with Complainant concerning settlement. NMED encourages settlement consistent with the provisions and objectives of HWA and applicable regulations. A request for a settlement conference does not extend the thirty (30) day period during which the written Answer and a Request for Hearing must be submitted. The settlement conference may be pursued as an alternative to and simultaneously with the hearing proceedings. Respondent may appear at the settlement conference itself and/or be represented by counsel.

Any settlement reached by the parties shall be finalized by written Order by the NMED Secretary. The issuance of such an Order shall constitute a waiver of Respondent's right to request a hearing on any matter stipulated to therein. To explore the possibility of settlement in this matter, contact the attorney assigned to this case, Ripley B. Harwood, Assistant General Counsel, Office of General Counsel, Environment Department, PO Box 26110, 1190 St. Francis Drive, Santa Fe, NM 87502, (505) 827-2854.

Compliance with the requirements of this Order does not relieve Respondent of its obligations to comply with all applicable laws and regulations.

This Order shall terminate when Respondent certifies that all requirements of this Order have been completed, and NMED has approved such certification.

1/28/93
DATE

JUDITH M. ESPINOSA, SECRETARY

By: Kathleen M Sisneros
KATHLEEN SISNEROS, Director
Water and Waste Management
Division

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing Administrative Order Requiring Compliance and Proposing To Assess A Civil Penalty was mailed postage prepaid, via certified mail, return receipt requested, on this 28 day of January, 1993, to the following:

Mr. Seigfried S. Hecker, Director
Los Alamos National Laboratory
P.O. Box 1663
MSK 490
Los Alamos, NM 87544

RIPLEY B. HARWOOD

C:LANL-AO4.UC

STATE OF NEW MEXICO
ENVIRONMENT DEPARTMENT

IN THE MATTER OF
THE REGENTS OF THE UNIVERSITY OF CALIFORNIA
LOS ALAMOS NATIONAL LABORATORY
LOS ALAMOS, NEW MEXICO
ID. NO. NM0890010515

RESPONDENT.

COMPLIANCE ORDER
NMHWA 93-03

ADMINISTRATIVE ORDER REQUIRING COMPLIANCE
AND PROPOSING TO ASSESS A CIVIL PENALTY

This Administrative Order (Order) is issued to the Regents of the University of California (Respondent) pursuant to the New Mexico Hazardous Waste Act (HWA), § 74-4-10 NMSA 1978. The authority to issue this Order has been delegated by the Secretary of the New Mexico Environment Department (NMED) to the Director of the Water and Waste Management Division (Complainant).

FINDINGS

1. Respondent is the Regents of the University of California.

2. Respondent is the management and operating contractor for the Los Alamos National Laboratory (LANL) pursuant to a contract with the U.S. Department of Energy (DOE), and is a co-operator of LANL. The United States, acting through DOE, is the owner and co-operator of LANL.

3. LANL is located principally in Los Alamos County, New Mexico, approximately sixty (60) miles northeast of Albuquerque and twenty-five (25) miles northwest of Santa Fe. The LANL site encompasses approximately forty-three (43) square miles.

4. LANL was chosen in 1942 as the site for the wartime development of the atomic bomb. The area was established as a military reservation, and operations began in 1943. Since 1943, the primary mission of LANL has been nuclear weapons research and development. In addition, the facility does work in magnetic and inertial fusion, nuclear fission, nuclear safeguards and security, laser isotope separation, and medical isotope development.

5. In association with the activities identified above, LANL generates, stores, and disposes of hazardous wastes and mixed wastes.

6. Upon information and belief, TA-54 Area G Pads ## 1, 2, and 4 are earthen-covered storage pads containing approximately seventeen thousand (17,000) drums of hazardous waste and mixed TRU waste, which, in some places, are set on asphalt, with drums piled four drums high. Respondent used these pads between 1979 and 1991.

7. DOE's TRU Waste Projects Task Force draft Report dated January 20, 1992 states, concerning "the integrity of the existing stored waste and potential environmental, health, and safety implications of the delay in WIPP," states that:

> [d]eteriorating packaging is a concern for [waste stored in metal drums, stacked on asphalt pads, covered with plywood, plastic and/or dirt]. Container failure rates in this "bermed" waste are a complicated function of drum contents and the external environment. Drums in direct contact with the soil have an estimated life of 10 years, at which point pinhole openings in the drum walls could start to appear. After that point, loss of drum integrity may be rapid. Failure rates approaching 100% have been estimated for buried drums or drums under failed plastic covers with 15 to 30 years of exposure. Corrosion and failure rates are lower for drums under intact plastic covers. Sites have found extreme situations in which older drums have completely disintegrated with drum contents dispersed in the surrounding soil.

> . . . An estimated 72% of retrievably stored TRU waste in drums [stored at 3 sites around the country, but not including LANL] has been in storage for 10 years or more. The Task Force estimates that in 1990, 20% to 30% of these drums contained corosion [sic] pinholes or were badly deteriorated. In 1995, the fraction is projected to rise to 30% to 40%, an increase which might be avoided by moving on the retrieval projects now rather than five years from now.

8. Respondent on or about March 16, 1992 exhumed fourteen (14) drums of hazardous waste from TA-54 Area G Pad #2 to determine their integrity. Respondent and/or its co-operator of LANL stated that the drums which were exhumed had been in place for about six (6) years, and, further, that Respondent and/or its co-operator observed surface corrosion on several of these drums and a pinhole failure on one drum.

9. Upon information and belief, Respondent subsequently failed to transfer the contents of the drums with surface corrosion and a pinhole failure to drums in good condition, and left them in place on the pad covered with a tarp.

10. On May 4-8, 1992, NMED employees Coby Muckelroy, Ernest Preciado, John Tymkowych, and Michael LeScouarnec (NMED inspectors) conducted a hazardous waste inspection at LANL (inspection).

11. At the time of the inspection, the NMED inspectors could not visually determine the number of drums under the soil at TA-54 Area G Pad # 1, their condition, or their placement.

12. Upon information and belief, with regard to the individual drums stored at TA-54 Area G Pad # 1: (a) the drums do not have adequate aisle space to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment in an emergency; (b) Respondent has no

written inspection schedule procedures for their inspection; (c) Respondent has no inspection logs recording the condition of the drums; and (d) the drums are not inspected weekly.

13. Upon information and belief, an unknown amount of the hazardous wastes stored at TA-54 Area G Pad # 1 is hazardous waste restricted from land disposal (LDR waste) that is being stored in containers that are not clearly marked to identify their contents and the date each period of accumulation began.

14. At the time of the inspection, the NMED inspectors could not visually determine the number of drums under the soil at TA-54 Area G Pad # 2, their condition, or their placement.

15. Upon information and belief, with regard to the individual drums stored at TA-54 Area G Pad # 2: (a) the drums do not have adequate aisle space to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment in an emergency; (b) Respondent has no written inspection schedule procedures for their inspection; (c) Respondent has no inspection logs recording the condition of the drums; and (d) the drums are not inspected weekly.

16. Upon information and belief, an unknown amount of the hazardous wastes stored at TA-54 Area G Pad # 2 is hazardous waste restricted from land disposal (LDR waste) that is being stored in containers that are not clearly marked to identify their contents and the date each period of accumulation began.

17. At the time of the inspection, the NMED inspectors could not visually determine the number of drums under the soil at TA-54 Area G Pad # 4, their condition, or their placement.

18. Upon information and belief, with regard to the individual drums stored at TA-54 Area G Pad # 4: (a) the drums do not have adequate aisle space to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment in an emergency; (b) Respondent has no written inspection schedule procedures for their inspection; (c) Respondent has no inspection logs recording the condition of the drums; and (d) the drums are not inspected weekly.

19. Upon information and belief, an unknown amount of the hazardous wastes stored at TA-54 Area G Pad # 4 is hazardous waste restricted from land disposal (LDR waste) that is being stored in containers that are not clearly marked to identify their contents and the date each period of accumulation began.

CONCLUSIONS

20. Respondent is a "person" as defined at § 74-4-3.K. of HWA, and HWMR-6, § 101, incorporated federal regulations 40 CFR § 260.10.

21. Respondent has "hazardous waste" at its facility as that term is defined at § 74-4-3.I. of HWA, and HWMR-6, § 101, incorporated federal regulations 40 CFR § 260.10.

22. Respondent has waste at its facility which is referred to as mixed waste which is defined as waste which contains a hazardous

waste component regulated under Subtitle C of the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §§ 6921 to 6939b, and the HWA; and a radioactive component consisting of source, special nuclear, or byproduct material regulated under the federal Atomic Energy Act (AEA).

23. Respondent engages in the "treatment", "storage" or "disposal" of hazardous waste as those terms are defined at § 74-4-3.Q., N., and C. of HWA, and HWMR-6, § 101, incorporated federal regulations 40 CFR § 260.10. Storage occurs in "containers" and "tanks" as those terms are defined at HWMR-6, § 101, incorporated federal regulations 40 CFR § 260.10.

24. Respondent is an "operator" of an "existing hazardous waste management facility" as those terms are defined in HWMR-6, § 101, incorporated federal regulations 40 CFR § 260.10.

25. Certain of Respondent's mixed waste management units may not have "interim status" as legally determined under HWMR-6, § 901, incorporated federal regulations 40 CFR Part 270, and are not operating under a permit. HWMR-6, § 601, incorporated federal regulations 40 CFR Part 265, governs waste management units that have interim status; HWMR-6, § 501, incorporated federal regulations 40 CFR Part 264, governs waste management units which are permitted or which do not have interim status. Complainant does not at this time and for purposes of this Order need to make a final determination of which Part these waste management units are regulated under.

26. HWMR-6, § 301, incorporated federal regulations 40 CFR § 262.10(a) makes the regulations in Part 262 (Standards Applicable to Generators of Hazardous Waste), applicable to Respondent. HWMR-6, § 601, incorporated federal regulations 40 CFR § 265.1(b) makes the regulations in Part 265 (Interim Status Standards For Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities), applicable to Respondent. Alternatively, HWMR-6, § 501, incorporated federal regulations 40 CFR § 264.1(b) makes the regulations in Part 264 (Standards For Owners and Operators of Hazardous Waste Treatment), applicable to Respondent. HWMR-6, § 801, incorporated federal regulations 40 CFR § 268.1(b) makes the regulations in Part 268 (Land Disposal Restrictions), applicable to Respondent.

27. HWMR-6, § 601, incorporated federal regulations 40 CFR § 265.35 requires Respondent to maintain aisle space to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of facility operation in an emergency, unless aisle space is not needed for any of these purposes. Alternatively, HWMR-6, § 501, incorporated federal regulations 40 CFR § 264.35 requires Respondent to maintain aisle space to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of facility operation in an emergency, unless Respondent can demonstrate to NMED that aisle space is not needed for any of these purposes.

28. Aisle space is necessary at TA-54 Area G Pads ## 1, 2, and 4 to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to the areas in an emergency.

29. HWMR-6, § 601, incorporated federal regulations 40 CFR § 265.15 requires Respondent to, among other things, inspect its facility, have a written schedule for inspection that includes the terms and frequencies called for in § 265.174, and record the inspections. Alternatively, HWMR-6, § 501, incorporated federal regulations 40 CFR § 264.15 requires Respondent to, among other things, inspect its facility, have a written schedule for inspection that includes the terms and frequencies called for in § 264.174, and record the inspections.

30. HWMR-6, § 601, incorporated federal regulations 40 CFR § 265.174 requires Respondent to inspect areas where containers are stored, at least weekly, looking for leaks and for deterioration caused by corrosion or other factors. Alternatively, HWMR-6, § 501, incorporated federal regulations 40 CFR § 264.174 requires Respondent to inspect areas where containers are stored, at least weekly, looking for leaking containers and for deterioration of containers and the containment system caused by corrosion or other factors.

31. Assuming Respondent is otherwise allowed to store LDR (land disposal restriction) waste, HWMR-6, § 801, incorporated federal regulations 40 CFR § 268.50(a)(2)(i) requires Respondent to

do so only so long as the container is clearly marked to identify its contents and the date each period of accumulation begins.

32. HWMR-6, § 601, incorporated federal regulations 40 CFR § 265.173(b) requires that containers holding hazardous waste must not be opened, handled, or stored in a manner which may rupture the container or cause it to leak. Alternatively, HWMR-6, § 501, incorporated federal regulations 40 CFR § 264.173(b) requires that containers holding hazardous waste must not be opened, nandled, or stored in a manner which may rupture the container or cause it to leak.

33. Containers holding hazardous waste at LANL's TA-54 Area G Pads ## 1, 2, and 4 are stored in a manner which may rupture the containers or cause them to leak.

34. HWMR-6, § 601, incorporated federal regulations 40 CFR § 265.171 requires Respondent to transfer the hazardous waste found in a container that is not in good condition, or that is beginning to leak, to a container that is in good condition or manage the waste in some other way that complies with the requirements of Part 265. Alternatively, HWMR-6, § 501, incorporated federal regulations 40 CFR § 264.171 requires Respondent to transfer the hazardous waste found in containers that are not in good condition, or that are beginning to leak, to containers that are in good condition or manage the waste in some other way that complies with the requirements of Part 264.

COUNT 1: IMPROPER STORAGE/TA-54 AREA G PAD #1

35. Paragraphs 1-13, and 20-34 are hereby incorporated by reference.

36. Respondent is in violation of HWMR-6, § 601, incorporated federal regulations 40 CFR § 265.173(b) for management of hazardous waste in a manner in which the hazardous waste containers may rupture or leak, at TA-54 Area G Pad #1. Respondent is also in violation of HWMR-6, §§ 601 and 801, incorporated federal regulations 40 CFR §§ 265.15, 265.35, 265.174 and 268.50(a)(2)(i) for storage without written inspection schedules, recorded inspections, without adequate aisle space, without weekly inspections, and without properly marking containers of LDR waste, at this site. Alternatively, Respondent is in violation of HWMR-6, § 501, incorporated federal regulations 40 CFR § 264.173(b) for management of hazardous waste in a manner in which the hazardous waste containers may rupture or leak, at TA-54 Area G Pad #1. Respondent is also in violation of HWMR-6, §§ 501 and 801, incorporated federal regulations 40 CFR §§ 264.15, 264.35, 264.174 and 268.50(a)(2)(i) for storage without written inspection schedules, recorded inspections, without adequate aisle space, without weekly inspections, and without properly marking containers of LDR waste, at this site.

COUNT 2: IMPROPER STORAGE/TA-54 AREA G PAD #2

37. Paragraphs 1-10, 14-16, and 20-34 are hereby incorporated by reference.

38. Respondent is in violation of HWMR-6, § 601, incorporated federal regulations 40 CFR § 265.173(b) for management of hazardous

waste in a manner in which the hazardous waste containers may rupture or leak at TA-54 Area G Pad #2. Respondent is also in violation of HWMR-6, §§ 601 and 801, incorporated federal regulations 40 CFR §§ 265.15, 265.35, 265.174 and 268.50(a)(2)(i) for storage without written inspection schedules, recorded inspections, without adequate aisle space, without weekly inspections, and without properly marking containers of LDR waste at this site. Alternatively, Respondent is in violation of HWMR-6, § 501, incorporated federal regulations 40 CFR § 264.173(b) for management of hazardous waste in a manner in which the hazardous waste containers may rupture or leak, at TA-54 Area G Pad #2. Respondent is also in violation of HWMR-6, §§ 501 and 801, incorporated federal regulations 40 CFR §§ 264.15, 264.35, 264.174 and 268.50(a)(2)(i) for storage without written inspection schedules, recorded inspections, without adequate aisle space, without weekly inspections, and without properly marking containers of LDR waste, at this site.

COUNT 3: IMPROPER STORAGE/TA-54 AREA G PAD #4

39. Paragraphs 1-10, and 17-34 are hereby incorporated by reference.

40. Respondent is in violation of HWMR-6, § 601, incorporated federal regulations 40 CFR § 265.173(b) for management of hazardous waste in a manner in which the hazardous waste containers may rupture or leak at TA-54 Area G Pad #4. Respondent is also in violation of HWMR-6, §§ 601 and 801, incorporated federal regulations 40 CFR §§ 265.15, 265.35, 265.174 and 268.50(a)(2)(i)

for storage without written inspection schedules, recorded inspections, without adequate aisle space, without weekly inspections, and without properly marking containers of LDR waste at this site. Alternatively, Respondent is in violation of HWMR-6, § 501, incorporated federal regulations 40 CFR § 264.173(b) for management of hazardous waste in a manner in which the hazardous waste containers may rupture or leak, at TA-54 Area G Pad #4. Respondent is also in violation of HWMR-6, §§ 501 and 801, incorporated federal regulations 40 CFR §§ 264.15, 264.35, 264.174 and 268.50(a)(2)(i) for storage without written inspection schedules, recorded inspections, without adequate aisle space, without weekly inspections, and without properly marking containers of LDR waste, at this site.

COUNT 4: FAILURE TO TRANSFER CONTENTS/TA-54 AREA G PAD #2

41. Paragraphs 1-10, 20-26, and 34 are hereby incorporated by reference.

42. Respondent is in violation of HWMR-6, § 601, incorporated federal regulations 40 CFR § 265.171 for failure to transfer hazardous waste found in containers that are not in good condition, or that are beginning to leak, to containers that are in good condition, or manage the waste in some other compliant manner, at TA-54 Area G Pad #2. Alternatively, Respondent is in violation of HWMR-6, § 501, incorporated federal regulations 40 CFR § 264.171 for failure to transfer hazardous waste found in containers that are not in good condition, or that are beginning to leak, to

containers that are in good condition, or manage the waste in some other compliant manner, at TA-54 Area G Pad #2.

CIVIL PENALTY

Section 74-4-10 of HWA authorizes the assessment of a civil penalty of up to ten thousand dollars ($10,000.00) per day for each violation of HWA and the regulations promulgated thereunder. Complainant hereby proposes to assess a civil penalty of one million two hundred eight-three thousand five hundred dollars ($1,283,500.00) against Respondent. The penalty is based on the seriousness of the violations and any good faith efforts on the part of Respondent to comply with the applicable requirements, and any economic benefit accruing to the Respondent, as well as such other matters as justice may require, and is calculated pursuant to the NMED's Civil Penalty Policy. The individual penalties for each violation are:

VIOLATION	AMOUNT
COUNT 1: IMPROPER STORAGE/TA-54 AREA G PAD #1	$381,250.00
COUNT 2: IMPROPER STORAGE/TA-54 AREA G PAD #2	$381,250.00
COUNT 3: IMPROPER STORAGE/TA-54 AREA G PAD #4	$381,250.00
COUNT 4: FAILURE TRANSFER CONTENTS/TA-54 AREA G PAD #2	$139,750.00
TOTAL:	$1,283,500.00

If you wish to contest the imposition of the penalty, see the soon following section entitled "Notice of Opportunity to Request a Hearing."

COMPLIANCE ORDER

NMED acknowledges receipt of the documentation contained in Jerry L. Bellows' (DOE) September 3, 1992 letter to Kathleen Sisneros concerning the correction of certain of the violations cited in this Order. Based on the foregoing Findings and Conclusions, and the September 3rd documentation, Respondent is hereby ordered to immediately comply with the following schedule of compliance:

1. Within thirty (30) days of receipt of this Order, have an NMED-approved plan and schedule for placing the wastes currently stored at TA-54 Area G Pads ## 1, 2, and 4 into storage that complies with the requirements of the HWA, and for closing the pads pursuant to the HWA.

2. Within thirty (30) days of receipt of this Order, provide documentation to NMED that Respondent has transferred the wastes in those containers of the fourteen (14) exhumed at TA-54 Area G Pad #2 that are not in good condition or which are beginning to leak, to containers that are in good condition or managed the waste in some other way that complies with the requirements of the HWA.

NOTICE

If you fail to take the corrective actions within the times specified in the Order, the Secretary may assess a civil penalty of not more than twenty-five thousand dollars ($25,000.00) for each day of continued noncompliance with the Order, pursuant to the HWA, § 74-4-10.C.

NOTICE OF OPPORTUNITY TO ANSWER AND REQUEST A HEARING

Where Respondent (a) contests any material fact or legal matter upon which the Order is based; (b) contends that the amount of the penalty proposed in the Order is inappropriate; or (c) contends that Respondent is entitled to prevail as a matter of law, Respondent shall file a written Request for Hearing together with an Answer to the Order with the Hearing Clerk within thirty (30) days after service of the Order. The Answer must clearly and directly identify what specifically Respondent is appealing.

The Answer shall clearly and directly admit, deny, or explain each of the factual allegations contained in the Order with regard to which Respondent has any knowledge. Where the Respondent has no knowledge of a particular factual allegation and so states, the allegation is deemed denied. Failure of Respondent to admit, deny, or explain any material factual allegation contained in the Order constitutes an admission of the allegation.

The Answer shall also state: (1) the circumstances or arguments which are alleged to constitute the grounds of defense; (2) the facts which Respondent intends to place at issue; and (3) whether a hearing is requested.

A hearing upon the issues raised by the Order and Answer shall be held upon the request of the Respondent. The Respondent shall attach to the Answer a copy of the Compliance Order to which the Request for Hearing pertains.

The Hearing Clerk's address is:

Barbara Rivera, Acting Hearing Clerk
New Mexico Environment Department
Post Office Box 26110
1190 St. Francis Drive

Harold Runnels Building, S-4100
Santa Fe, NM 87502
(505) 827-2842

FINALITY OF ORDER

The Order shall become final unless Respondent files a written Request for Hearing with an Answer within thirty (30) days of service of this Order. For purposes of this action, failure by Respondent to file an Answer constitutes an admission of all facts alleged in the Order and a waiver of Respondent's right to a hearing under § 74-4-10 of HWA concerning such factual allegations. The proposed penalty shall become due and payable by Respondent without further proceedings sixty (60) days after Respondent's failure to file an Answer. Respondent must immediately comply with the Order provisions in this Order.

SETTLEMENT CONFERENCE

Whether or not Respondent requests a hearing, Respondent may confer with Complainant concerning settlement. NMED encourages settlement consistent with the provisions and objectives of HWA and applicable regulations. A request for a settlement conference does not extend the thirty (30) day period during which the written Answer and a Request for Hearing must be submitted. The settlement conference may be pursued as an alternative to and simultaneously with the hearing proceedings. Respondent may appear at the settlement conference itself and/or be represented by counsel.

Any settlement reached by the parties shall be finalized by written Order by the NMED Secretary. The issuance of such an Order

shall constitute a waiver of Respondent's right to request a hearing on any matter stipulated to therein.

To explore the possibility of settlement in this matter, contact the attorney assigned to this case, Ripley B. Harwood, Assistant General Counsel, Office of General Counsel, Environment Department, PO Box 26110, 1190 St. Francis Drive, Santa Fe, NM 87502, telephone number (505) 827-2854.

Compliance with the requirements of this Order does not relieve Respondent of its obligations to comply with all applicable laws and regulations.

This Order shall terminate when Respondent certifies that all requirements of this Order have been completed, and NMED has approved such certification.

JUDITH M. ESPINOSA, SECRETARY

1/28/93
DATE

By: Kathleen M. Sisneros
KATHLEEN SISNEROS, Director
Water and Waste Management
Division

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing Administrative Order Requiring Compliance and Proposing To Assess A Civil Penalty was mailed postage prepaid, via certified mail, return receipt requested, on this 28 day of January, 1993, to the following:

Mr. Seigfried S. Hecker, Director
Los Alamos National Laboratory
P.O. Box 1663
MSK 490
Los Alamos, NM 87544

Rip Harwood
RIPLEY B. HARWOOD

A:LANL-AO3.UC

Attachment B

Revised ~~Amended~~ Remedial Action Plan

This Revised ~~Amended~~Remedial Action Plan amends ~~and is a substitute for that certain~~ the Amended Remedial Action Plan, Attachment B to ~~that certain~~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 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 the ~~substitution of this~~Revised ~~Amended~~ Remedial Action Plan as Attachment B to the Consent Agreement.~~, in place of the Remedial Action Plan, Amendment B to the Consent Agreement, by signing in the designated space provided below.~~

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 the ~~substitution of this~~ Revised ~~amended~~Remedial Action Plan, as Attachment B to the Consent Agreement, ~~in place of the Amended Remedial Action Plan, 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.

APPROVED:

_____

Dennis J. Erickson DATE
Division Director
Environment, Safety and Health Division
Los Alamos National Laboratory

_____

~~G. Thomas Todd~~David Gurulé DATE
Area Manager
Los Alamos Area Office
U.S. Department of Energy

_____

Edward Kelley DATE
Director Water and Waste Management Division
New Mexico Environment Department

_____

Peter Maggiore ~~Mark E. Weidler~~ DATE
Secretary
New Mexico Environment Department

~~Dennis J. Erickson~~ ~~DATE~~ ~~G. Thomas Todd~~ ~~DATE~~
~~Division Director~~ ~~Area Manager~~
~~Environment, Safety and~~ ~~Los Alamos Area Office~~
~~Health Division~~ ~~U.S. Department of Energy~~
~~Los Alamos National Laboratory~~

~~Edward Kelley~~ ~~DATE~~ ~~Mark E. Weidler~~ ~~DATE~~
~~Director of Water and Waste~~ ~~Secretary~~
~~Management Division~~ ~~State of New Mexico~~
~~State of New Mexico~~ ~~Environmental Department~~
~~Environmental Department~~

The following sections present listed actions and a phased plan necessary to retrieve TRU radioactive and TRU mixed waste from TRU Pads 1, 2, and 4 and place into inspectable storage. A Safety Analysis Report has been prepared and approved for this remedial action~~Because the Safety Analysis Report, which is being prepared for this remedial action, is not final, and because the RCRA Part B Permit Application, and the Facility Final Design are currently being reviewed by NMED, this plan may have to be modified to ensure:~~. Changes to the Safety Analysis Report (SAR) are accomplished using the established DOE Order 5480.21 Unreviewed Safety Question Determination (USQD) Program. All proposed changes to the Transuranic Waste Inspectable Storage Project (TWISP) operational procedures/processes undergo a review in accordance with the requirements of the USQD Program. In the event that changes to operations or the SAR affect the requirements in this Revised Remedial Action Plan (Revised RAP), the USQD Program will be the change mechanism utilized, and interim method of documentation, for the Revised RAP.

The USQD Program is designed to allow the TWISP to make limited changes to the content of the SAR thus allowing flexibility in day to day operations. The program requires TWISP management to formally review all changes (operational, design, etc.) prior to implementation. The changes are reviewed against the following criteria:

- Could the change increase the probability of an accident?
- Could the change increase the consequences of an accident?
- Could the change increase the probability of failure of equipment important to safety?
- Could the change increase the consequences of failure of equipment important to safety?
- Could the change create a new failure mechanism of equipment important to safety?
- Could the change create a new accident type?
- Will the change reduce the margin of Safety?

If any of these questions are answered in the affirmative, the TWISP must justify how controls will be in place to minimize the risk associated with the change. Additionally, DOE must approve the change. The USQD Program cannot be used to change the project deliverables as specified in Attachment C. NMED will be notified in writing immediately upon initiation of the

USQD process for any changes in TWISP operations that affect procedures as described in this Revised RAP. All such USQDs finally approved by DOE and the University of California shall be incorporated during an annual review cycle, and provided to NMED on or before 1/30 of the year following the change. Changes to this plan may be made to ensure:

- worker and public safety
- protection of the environment
- the most safe and effective method is used to retrieve the waste
- compliance with State requirements

Listed Actions

Completed Actions

1. Established a site-specific environmental surveillance program.
2. Installed high-volume air samplers.
3. Prepared and completed ES&H documentation, as necessary.
4. Procured Special Equipment for Retrieval and Storage operations.
5. Prepared Preliminary Safety Analysis Report.
6. Prepared and obtained approval of the TWISP Final Safety Analysis Report.
7. Completed Design Upgrades to existing Drum Prep Facility.
8. Completed Final Design for TRU Waste Retrieval Dome Project[1].
9. Completed Final Design for TRU Waste Temporary Storage Dome Project[1].
10. Completed Design of Drum Vent System.
11. Prepared and obtained approval of -Detailed Operating Procedures.
12. Fabricated and Tested Drum Vent System.
13. Procured Contractor.
14. Completed Construction of Retrieval Dome over Pad 1; Completed Construction of Storage Domes for Pad 1 waste.
15. Completed Personnel Training/Operational Readiness Review.
16. Completed Construction of Storage Domes for Pad 4 waste.
17. Completed Retrieval Operations on Pad 1.

Actions to be Completed

~~2.Complete Construction of Retrieval Dome over Pad 4.~~

1. Complete Retrieval Operations on Pad 4.

2. Complete Construction of Retrieval Dome over Pad 2.

~~2.. Complete Construction of Storage Dome over Pad 1.~~

3. Complete Construction of Storage Dome over Pad 4.

4. Complete Retrieval Operations on Pad 2.

5. Complete Salvage of Retrieval Equipment and Retrieval Dome.

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

The Retrieval Operation

A. Construction and Retrieval Phasing

The retrieval of waste from TRU Pads 1, 2, and 4 is organized into four construction phases. After each of the first three construction phases, waste is retrieved from TRU Pads 1, 4, and 2, respectively. The fourth construction phase is necessary to salvage equipment, and disassemble the retrieval dome. Each construction phase is divided up into two separate projects; the Retrieval ~~Dome~~ Project and the Storage Dome Project.

Project site activities ~~will~~ began with Construction Phases I-R and I-S (-R refers to the Retrieval ~~Dome~~ Project and -S refers to the Storage Dome Project). Activities within Phases I-S and I-R are clearly identified in Figures 1 and 2.

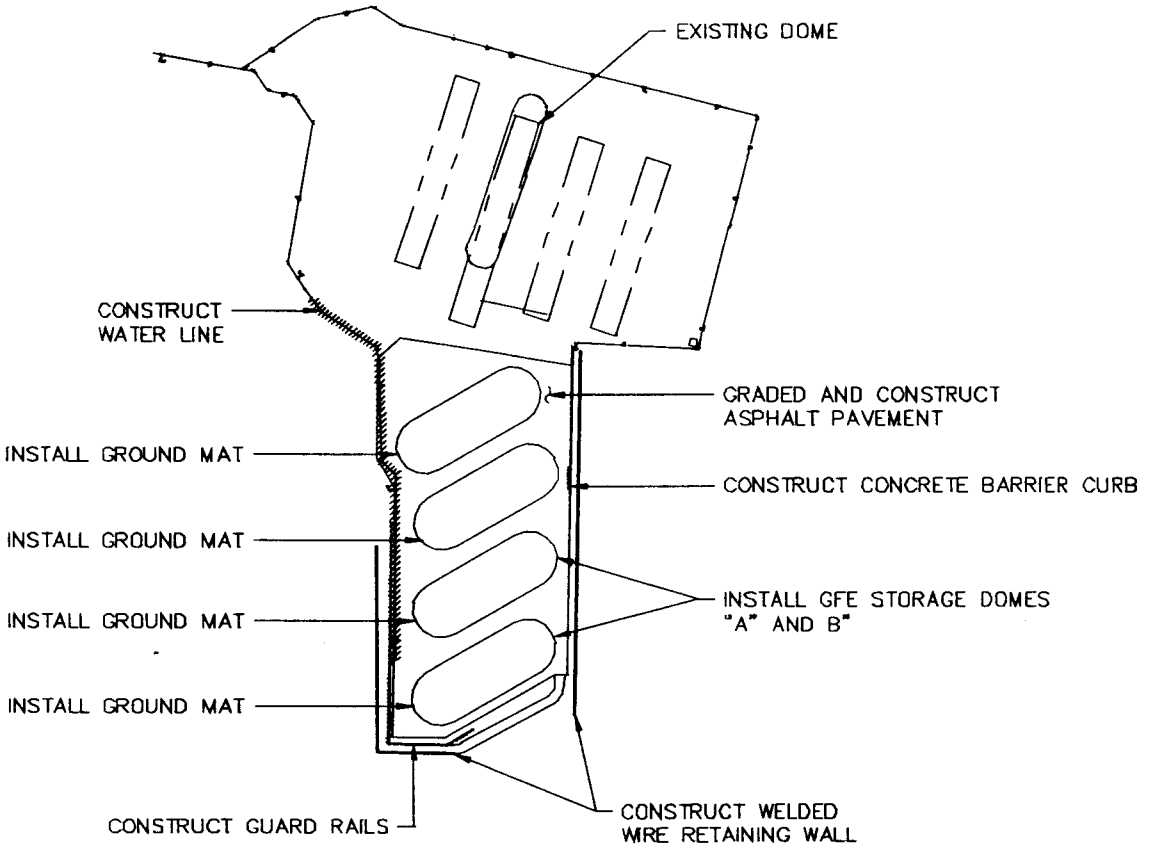


Figure 1. Construction Phase I–S

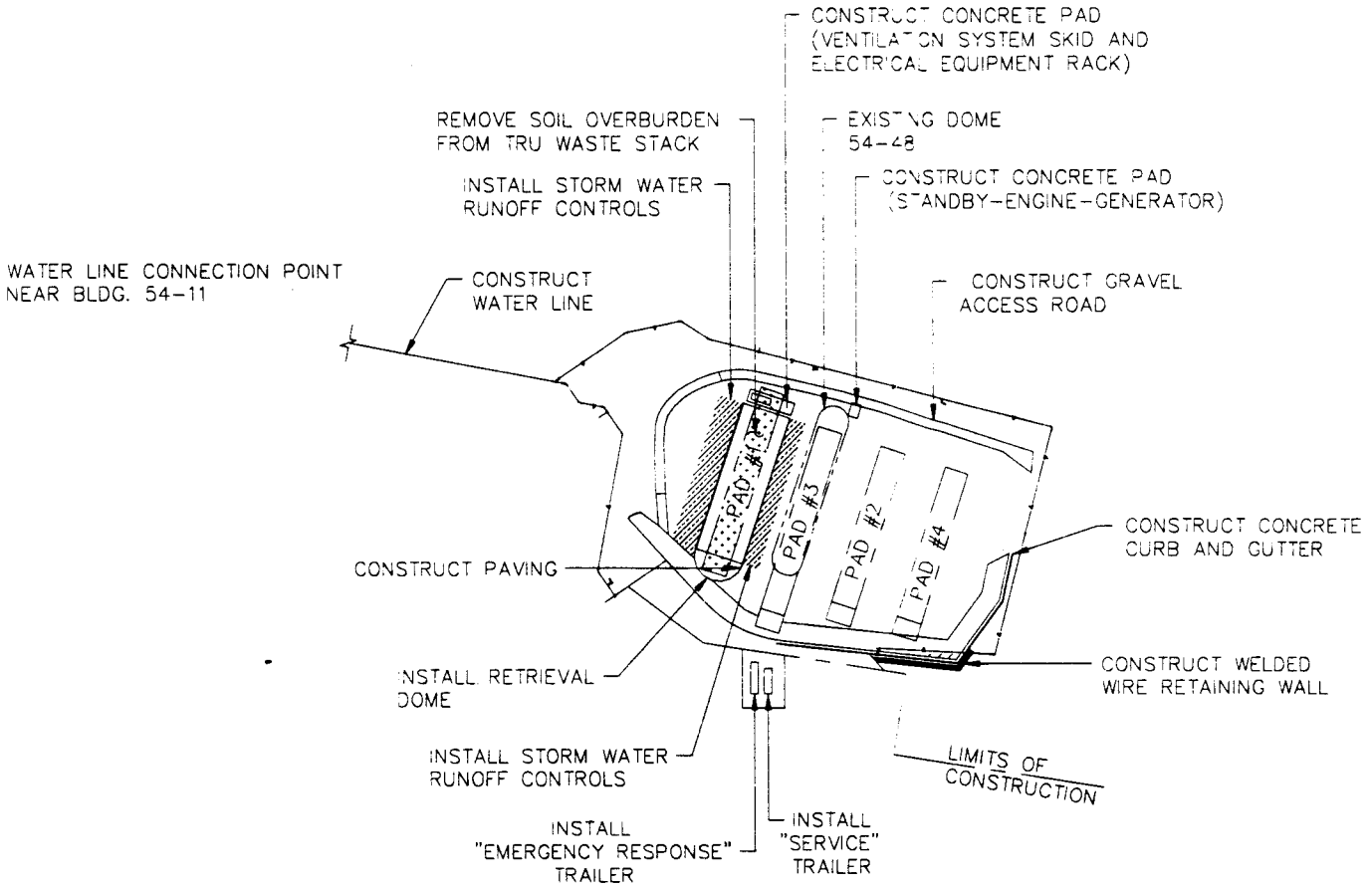


Figure 2. Construction Phase I-R

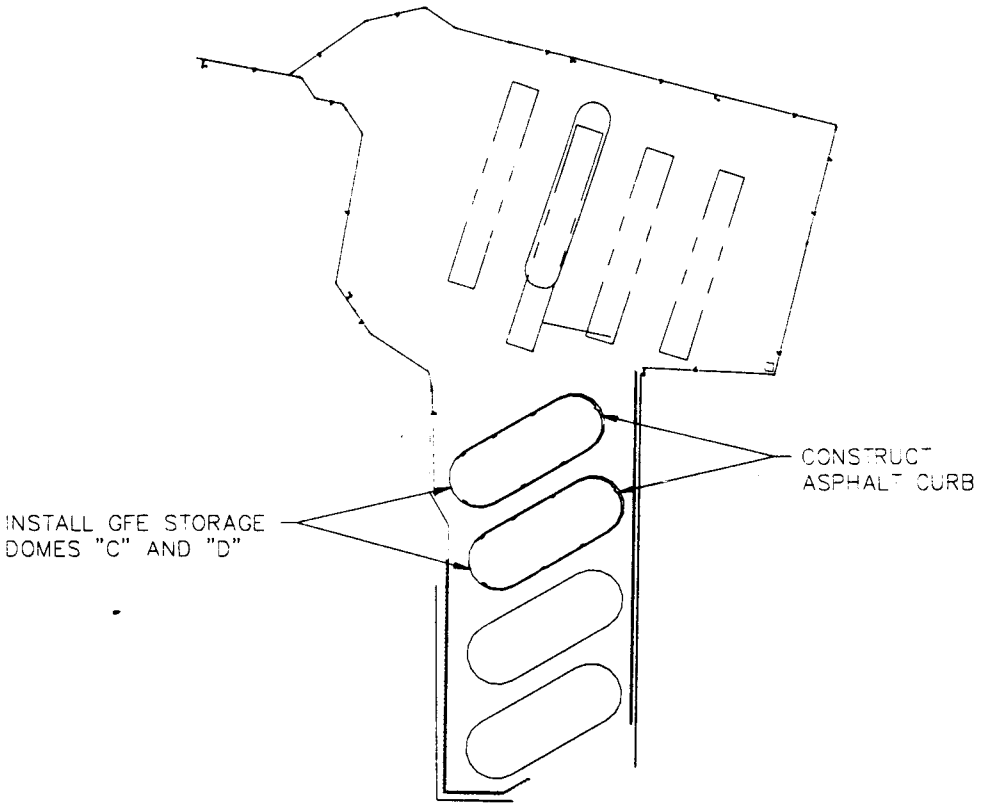


Figure 3. Construction Phase II-S

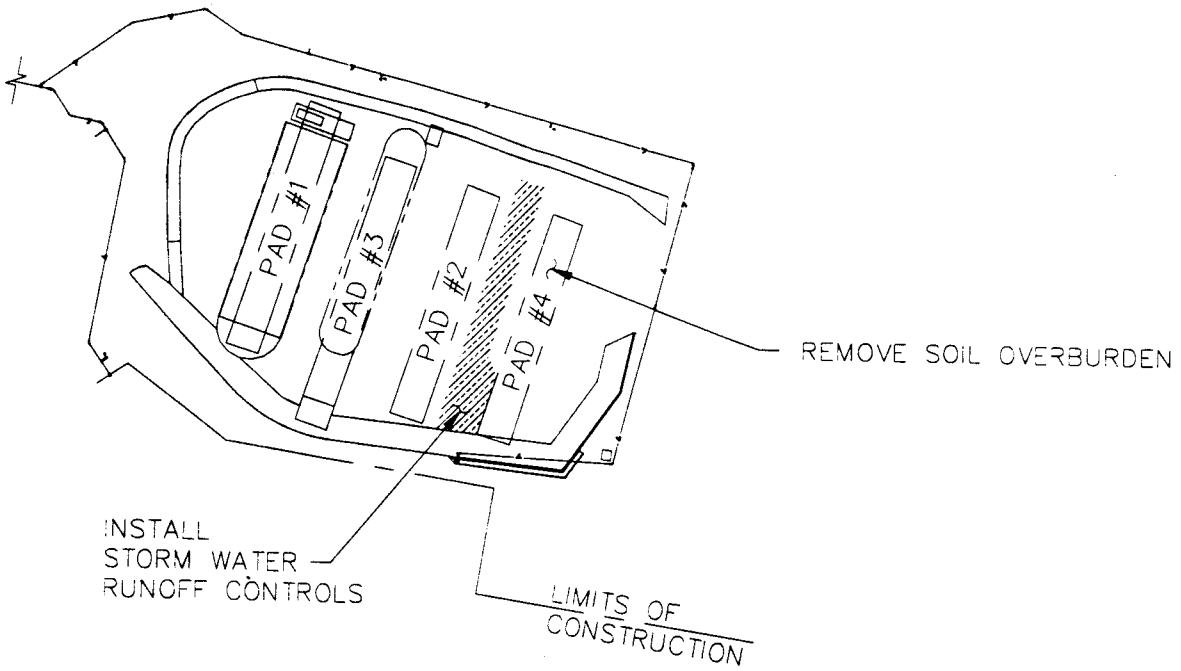
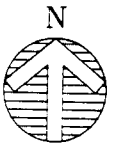


Figure 4. Construction Phase II-R



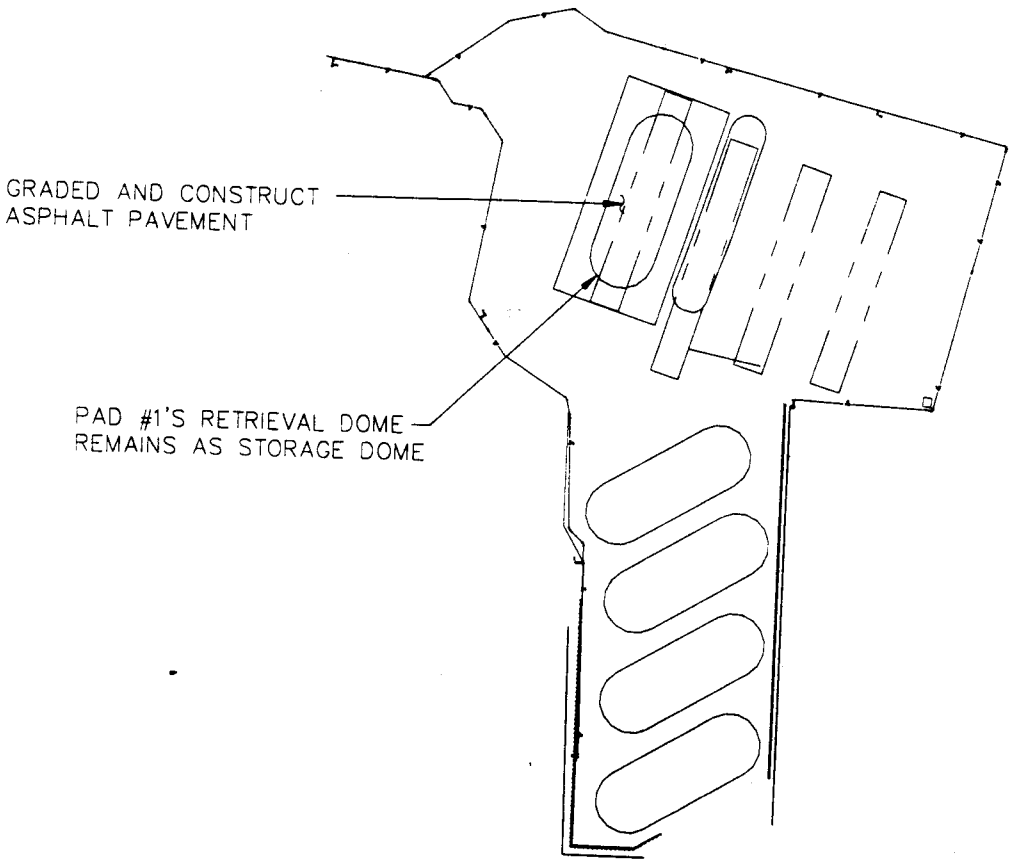


Figure 5. Construction Phase III–S

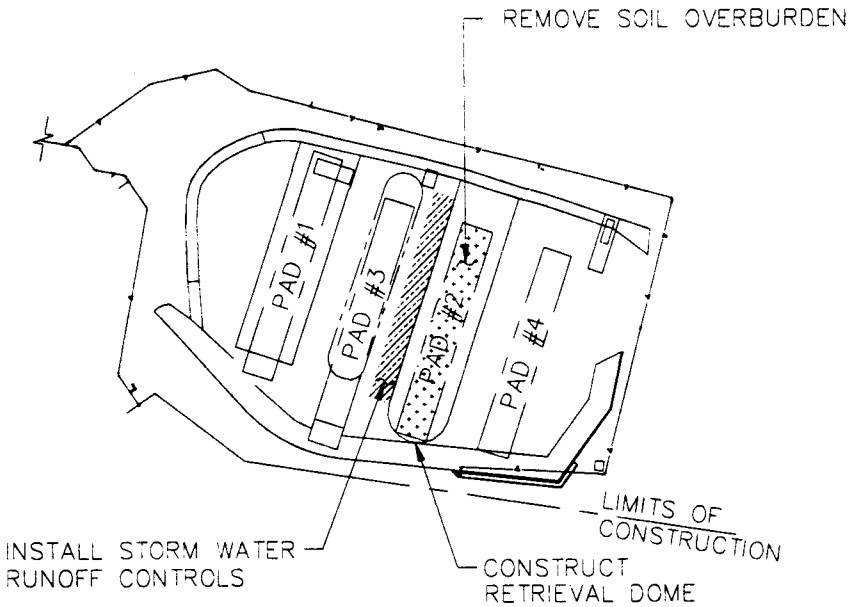
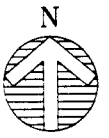


Figure 6. Construction Phase III–R



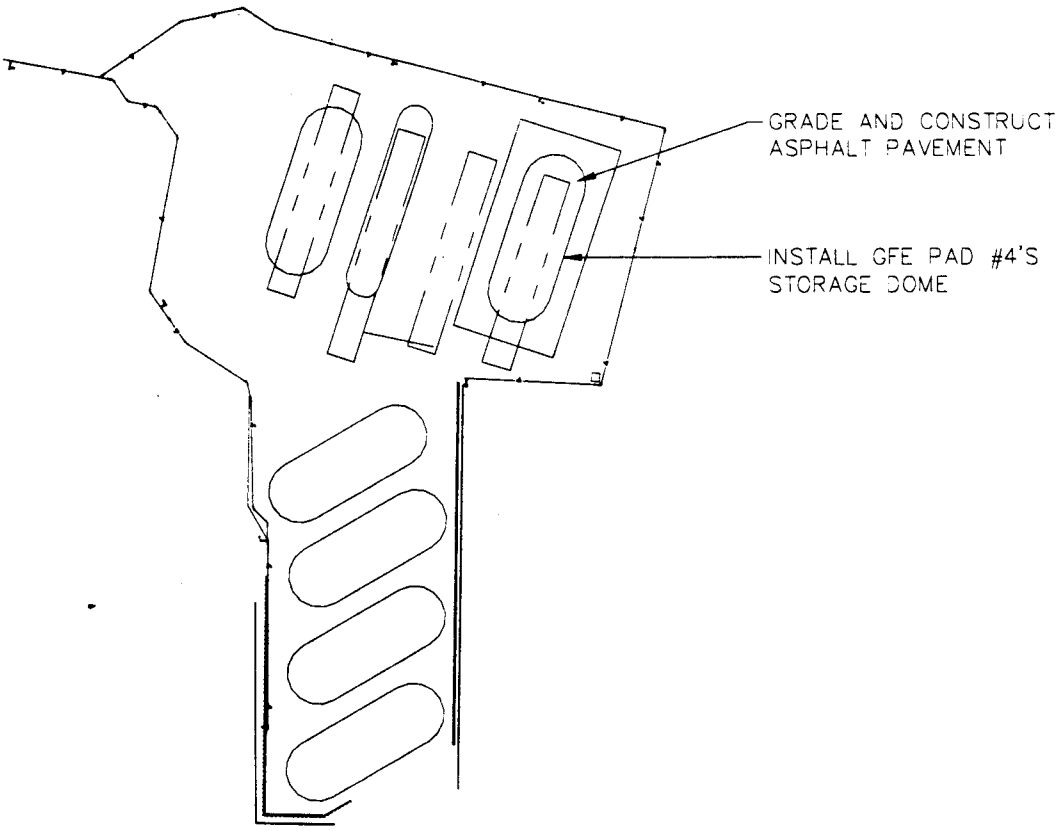
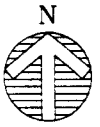


Figure 7. Construction Phase IV-S



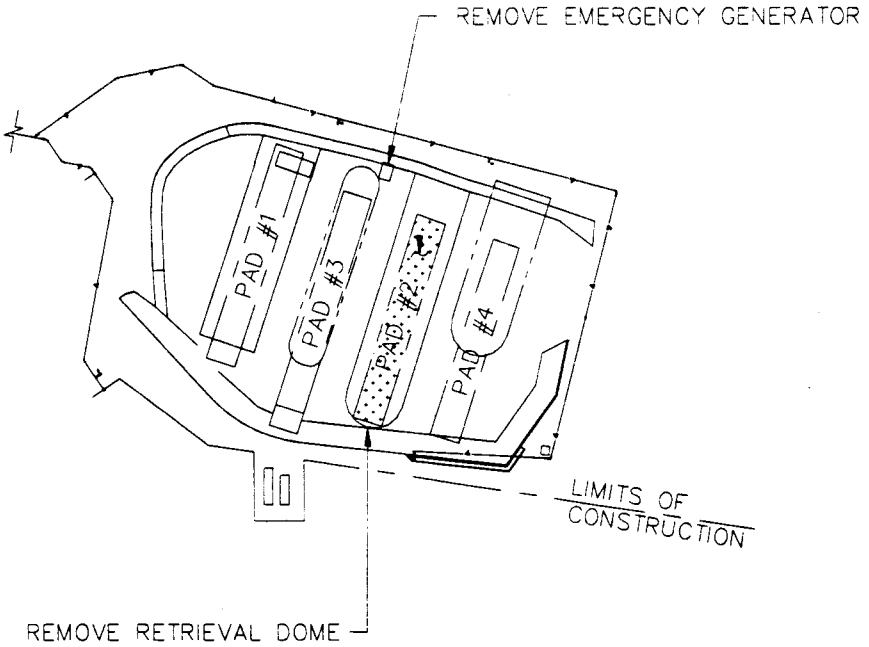


Figure 8. Construction Phase IV-R

B. Detailed Description

1. Storage Domes

Construction Phases I-S and II-S have been completed. Site work has been performed to ensure that stormwater discharge requirements under the Laboratory's National Pollution Discharge Elimination System (NPDES) general permit are met and best management practices for stormwater runoff are utilized. Each of the storage domes is a tension supported structure with fabric walls and aluminum support. Asphalt curbs have been installed around the inside perimeter of each of the domes. Power, communication systems, and fire protection (hydrants) services have been extended as needed to the domes.

The existing retrieval dome over Pad 1 will remain for storage and other management activities upon completion of retrieval activities on Pad 1.

Preparatory site work has been completed for Pad 4. Similar to what was done for Pad 1, asphalt will have to be added to Pad 4. The Laboratory fully expects Pad 4's asphalt to be in excellent condition. If the asphalt is not in excellent condition, that is if 30% or more of the asphalt pad is degraded, the entire asphalt pad will be replaced. In any case, any damaged portions of asphalt will be repaired. Utilities and Site stormwater runoff controls will be established similar to Construction Phases I-S and II-S.

~~As Figure 1 shows, Construction Phases I-S include considerable site work. The surface of LLW Pits 1 and 3 (just south of the TRU pads where the retrieval operation will be executed) is not level enough to permit construction of the four new storage domes without grading. Because the site is over old waste disposal pits, grading must be accomplished primarily by fill and compact methods. The soft surface will be surveyed to determine whether radioactive contamination exists from previous disposal operations. If radiation above background levels is detected, the areas of contamination will be handled appropriately. Clean fill will be obtained from the spoils pile of crushed tuff created by excavation of LLW disposal pits. After compaction and grading, the asphalt pad will be laid.~~

~~A primary reason for the large amount of site work is to ensure that stormwater discharge requirements under the Laboratory's National Pollution Discharge Elimination System (NPDES) general permit are met and best management practices for stormwater runoff control are utilized.~~

~~During the latter part of Construction Phases I-S and I-R, Storage Domes A and B will be erected at the south end of the completed asphalt pad. Each of the planned storage domes is a tension support structure with fabric walls and aluminum supports. Asphalt curbs will then be installed around the inside perimeter of each of the domes. Power, communication systems, and fire protection (hydrants) services will be extended to the domes. Finally, prior to waste transfer into the new domes, ambient air monitoring will be conducted inside the dome to establish "background" conditions.~~

~~Construction Phase II-S includes erecting Storage Domes C and D on the asphalt pad. Asphalt curbs will also be constructed around the inside perimeter of these domes. As necessary, utilities will again be extended to the domes.~~

~~During Construction Phase III-S, some additional site work and erection of Pad 1's Storage Dome will occur. Additional asphalt will be added to both east and west sides of the present Pad 1. This site work will allow Pad 1's Storage Dome to fit on the Pad 1. As with the previous domes, an asphalt curb will be present around the inside perimeter of the dome.~~

~~Similar to Construction Phase III-S, Construction Phase IV-S includes additional site work before Pad 4's New Storage Dome can be constructed. Similar to Pad 1, asphalt will have to be added to both east and west sides of Pad 4. The Laboratory fully expects Pad 1's and Pad 4's asphalt pad to be in excellent condition. If the asphalt is not in excellent condition, that is if 30% or more of the asphalt pad is degraded, the entire asphalt pad will be replaced. In any case, any damaged portions of asphalt will be repaired.~~

2. Retrieval Dome

Construction Phase I-R ~~also~~ has been completed. A~~a~~ substantial amount of site work was conducted that focused around Pad 1~~most of which is focused around Pad 1~~. The site work includeds: ~~a~~ water line installation, asphalt access paving along south edge of the site, extension of electrical power, installation of stormwater runoff controls, removal of the majority of the tuff cover over Pad 1 and erection of the Retrieval Dome over Pad 1. All tuff cover was~~ill~~ not ~~be~~ removed because it was~~is~~ necessary to leave minimal cover of soil on top of the stack to provide weather protection and a fillet of tuff around the perimeter to support and stabilize the stack of waste containers. As appropriate, the tuff was~~ill~~ ~~be~~ screened for radionuclide constituent contamination. Clean tuff removed from the pad was~~ill~~ either ~~be~~ taken to the current LLW disposal pit for use as backfill or used as fill for Construction Phase I-S. No c~~C~~ontaminated soil was identified~~ill be handled as appropriate~~.

Once site preparation for the Retrieval Dome was~~is~~ complete and the R~~r~~etrieval D~~d~~ome was~~is~~ erected, equipment and structural accessories necessary to ensure the Retrieval Dome was~~is~~ functional were~~ill~~ ~~be~~ installed. The HEPA-filtered exhaust system and associated ductwork were ~~ill be~~ installed and attached to the skidmounted exhaust blower and filter bank. ~~An emergency power system (EPS) will be placed to the north of Pad 1. Though the EPS should not be necessary because work will stop if power is lost, it will provide power during power outages, or other emergencies. Two partitioning curtains will be hung from the dome frame to segregate the work area from the remainder of the enclosure and each curtain will be moved along the pad as waste is being removed.~~ Personnel doors for emergency egress are~~will be~~ present along both sides of the work area. Electrical power was~~ill be~~ extended into the Retrieval Dome to power continuous air monitors (CAMs) and local and general ventilation systems~~, and the drum venting system~~, as needed. Support trailers were~~will be~~ located near Pads 1, 2, and 4.

Once the waste from Pad 1 is retrieved, Construction Phase II-R for retrieval of Pad 4 waste will then begin. The Pad 1 Retrieval Dome will be maintained for use as a storage and waste processing facility. ~~will remain available for interim storage of wastes during and after retrieval~~

~~operations.~~ This phase includes preparatory site work at Pad 4, equipment relocation as needed~~,~~ and installation of stormwater runoff controls. ~~and the relocation of the existing Retrieval Dome from pad 1 to Pad 4~~

Mobile enclosures constructed of fabric or plastic will be available for use should potentially damaged drums and/or boxes be encountered. Portable HEPA systems will be available during retrieval operations, and will be utilized if needed. Monitoring requirements will be determined and routinely evaluated to ensure that monitoring is adequate for retrieval operations. Electrical service for equipment, in addition to grounding and lightning protection systems, will be provided in accordance with applicable requirements.

After retrieval operations at Pad 4 are complete, Construction Phase III-R for retrieval of Pad 2 waste will then begin. Similar to Construction Phase II-R, this phase includes preparatory site work around Pad 2 including installation of stormwater runoff controls~~,~~ and equipment relocation as needed~~, and the relocation of the Retrieval Dome from Pad 4 to Pad 2~~. The protective measures identified for Pad 4 will be implemented for Pad 2, if needed. Finally, after retrieval operations are finished on Pad 2, Construction Phase IV-R will ensure that all equipment is either salvaged or disposed as appropriate.

3. Soil Removal

As retrieval operations progress on each pad, the tuff over the working face of the stack will be removed by various pieces of earth moving equipment and supplemented by hand loading tuff ~~into wheelbarrows~~ as needed.

The fillet of tuff across the front of the stack and that extends along the sides near the working face will also be removed by various pieces of earth moving equipment and hand loading if needed. When the fillet has been dropped below the top row of waste packages, the crates will be otherwise supported, as needed, until the working face has been brought into a stable, stepped configuration. As the working face of the stack retreats, the soil removal operation will be repeated~~several times~~.

When all of the tuff has been removed from the working face, an air sample will be drawn from within the plywood and plastic cover. Along with the continued monitoring throughout the entire project, this sample will help Health Physics (HPT) and Industrial Hygienist (IHT) Technicians determine the extent of respiratory protection required during the removal of the plywood and plastic sheeting. After tuff removal, the plastic and plywood cover material will be disposed as appropriate.

4. Waste Package Retrieval

After the tuff has been removed from the working face and unnecessary dirt removal equipment removed from the working area, waste package retrieval can begin. Retrieval equipment will typically ~~-~~include forklifts, a small crane, a front-end loader, temporary enclosures, CAMS, giraffe air monitors, ~~a~~ HEPA-filtered vacuum cleaner~~,~~ and HEPA-filtered ventilation system, ~~and~~ hand-held tools, and other equipment as needed.

The waste package configuration within the stack can vary, but the most common arrangement consists of crates stacked along the sides and ends of individual storage cells, with drums stacked in the center. Crates are seldom stacked more than two high (with the largest crates on the bottom), and drums are commonly stacked four high. Waste package data, including an identification number, radioisotopic data, LANL waste content code, waste generator, weight, and the date the package was sealed are readily available from the TRU waste database. The database information will be available at the work site so that workers will know the nature of the waste ~~in each~~ packages before they are~~it is~~ handled.

a. Crates

Because FRP crate construction was not standardized when the waste was packaged, crate handling during waste retrieval cannot be standardized. The exact retrieval method used will be determined on a case-by-case basis. One method for crate retrieval may be to remove all waste packages around the individual crate, attach a long section of horizontally suspended I-beam (strongback) with fabric slings (which are spread to prevent crushing the top of the container), and lift the crate by strongback with a small crane or a forklift. An alternate method for FRP crate removal may involve using a large capacity forklift. If the bottom of the crate is significantly degraded, a metal sheet can be slid under the crate and the slings will pick the crate up from this new metal base. ~~All such d~~Damaged crates will be handled on a case by case basis. Damaged crates will be repaired, overpacked, or repackaged as necessary to support removal from the retrieval area.~~before they leave the work area by placing the contents of the damaged container in a sea-land metal container.~~

Interviews (October 1993) with technicians who worked on the TRU Pads in the late 1980s, revealed that some crates may contain liquids. The interviews revealed two sources for this potential liquid. Rainwater is one potential source. The rainwater may be present because the crates were left outside for significant periods before they were covered with a plastic tarp and overburden. The second source for the potential liquids is associated with capped process piping~~,~~ and process piping~~,~~ that ~~which~~ was used in conjunction with the gloveboxes. Though all piping was drained (as thoroughly as possible) and capped before placement into the crates, it is difficult for the Laboratory to ensure there are no residual liquids remaining within the capped pipes. Therefore, crates must be handled on a case-by-case basis, but all crates will be checked for rainwater and drained of rainwater as necessary. After each crate is inspected to ensure crate integrity, the crate will be sent directly to the appropriate storage dome. Those crates known to contain liquids will be stored with secondary containment inside the appropriate storage dome. Crates suspected of containing water, which might leak, will be stored with secondary containment inside the appropriate storage dome.~~Again, because it may be nearly impossible to ensure any particular crate has absolutely no liquids within it, all crates will be stored on additional containment areas when placed in the appropriate storage dome.~~

b. Drums

~~Steel drums will usually be retrieved by forklifts or a small crane~~Forklifts or a small crane will usually be used to retrieve steel drums. Drum retrieval will begin with a visual, in-place assessment of the drum integrity. The drum's ~~top.~~ visible sides, and visible portions of the bottom rim will be inspected for corrosion and ~~,~~ pitting~~, and rim separation~~. Drums that fail the visual inspection will be reinforced and/or overpacked as appropriate before they are removed from the retrieval area.~~in situ before their removal from the stack~~ ~~A radiological contamination swipe survey will be performed before moving the drum to determine whether removable contamination exists on the drum exterior.~~

If the drum appears to have integrity, it ~~and a smear shows no removable surface contamination. the drum~~ will be removed from the array using manual techniques and construction equipment. After the drum is safely in the drum staging area, dust and dirt will be removed from the drum using filtered vacuuming or manual cleaning, and a thorough radiological survey for contamination will be conducted. Should removable surface contamination be detected, worker protective measures will be evaluated and contamination-control procedures, such as vacuuming, fixation, or plastic wrapping, will be implemented before subsequent handling. ~~A permanent bar code label containing the drum identification number will be affixed to the drum after this cleaning and inspection. This drum identification number will be cross-referenced to the original drum identification number contained in the LANL TRU waste database.~~

During drum retrieval, continuous air monitors (CAMs) will be utilized to monitor for potential airborne contamination. In the event a CAM alarm occurs, a portable localized ventilation system will be used, as appropriate, to control any sources of airborne contamination. In addition, temporary enclosures as discussed in Section 2, may be used to control potential airborne contamination.

~~During this time, local ventilation will be drawing air from the foot of the stack and from the floor level where the drums are being placed. This local ventilation will supplement the work area ventilation. The number of drums removed at one time will vary, but will average about 24 per day.~~

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

~~after they are vented or after they are placed into storage. If liquids do appear in the RTR examination, these drums will be overpacked with an absorbent between the 55 gallon drum and the overpack. Drums that contain a waste matrix with a likelihood to contain free liquids will be overpacked with an absorbent between the 55 gallon drum and the overpack. Any drum either identified by the RTR as a container with free liquids or identified as a drum which contains a waste matrix with a probability to have free liquids will be stored within an area with additional containment inside the appropriate storage dome.~~

5. Drum Preparation

Drums received at the Drum Preparation Facility will be unloaded by forklift to the ground where they will be transferred onto multi-wheeled dollies or drum carts to be cleaned, inspected,

surveyed for contamination~~ and surface radiation levels~~, painted as necessary, and/or vented as necessary. A permanent bar code label containing the drum identification number will be affixed to the drum after this cleaning and inspection. This drum identification number will be cross-referenced to the original drum identification number contained in the LANL TRU waste database.~~Each drum will be supplied with appropriate barcode and other identification labels. Drums will then be sent to storage.~~

6. Drum-Venting System

~~Drums that have been pre-identified through a database review as potentially containing an explosive gas mixture will be vented to ensure they do not contain an explosive mixture of gases in the headspace.~~ All drums will be vented to meet the Waste Acceptance Criteria of the disposal facility as necessary. Drums ~~requiring venting~~will be placed one at a time, into the skid mounted Drum Venting System (DVS) where the drum lid will be punctured and a gas sample drawn. The explosivity of the gas mixture will be determined, and a HEPA-filtered vent will be installed. If a drum actually contains an explosive mixture, it will either be purged or simply allowed to aspirate until a safe mixture is attained. ~~All drums will be vented to meet the Waste Acceptance Criteria of the disposal facility as necessary.~~

7. Transportation

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

8. Storage Operations

Within the storage domes, the waste packages will be handled by common commercial equipment such as forklifts with drum lifting attachments, strongbacks, and slings. ~~The forklifts will be either propane or diesel fueled.~~ Other equipment in the storage enclosures will include an assortment of survey instruments, CAMS, eye wash stations, and fire extinguishers.

Crates will be arranged in rows, two~~one~~ high and one wide, with at least ~~28~~24 inches between rows to allow for inspection. 55-gallon drums of similar waste will be banded together ~~in groups of four~~ on ~~metal~~ pallets which are then stacked three high in rows at least ~~28~~24 inches apart. Overpacked drums will receive similar treatment. ~~except that they will be placed on larger pallets and stacked only two high.~~ Any container, from the TRU Pads, that has been confirmed to contain liquid will be stored in Dome 230 or segregated within one of the operating storage domes with ~~to an area of additional~~secondary containment. Whenever waste packages are moved out of a storage dome, the waste package identification numbers, their origin and destination, and package changes (overpack volume and/or dimensions) will be documented and used to update the TRU waste database.

380 COMPLIANCE SCHEDULE: Attachment "C" (10/25/93)
381

Complete[1]	LANL[2]	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[3]. 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.[4]
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[5]	LANL	Complete pad[2] retrieval and have all wastes from Area G hazardous waste storage Pad #s 1, 2 and 4 placed into Area G TRU Storage Units.

Notes

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

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

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

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

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

Summary of 1998 Changes/Justification to the 1997 Amended Remedial Action Plan

Section and Line Numbers	Action	Justification
Attachment B Lines 3, 4, 5, 13, 18	Identified this submittal as the Revised Remedial Action Plan	This change is made to differentiate between this document and the previous Remedial Action Plan as amended in February 1997.
Approval Line 29	Replaced Thomas Todd's name with David Gurulé in DOE-LAAO signature block	Mr. Gurulé has replaced Mr. Todd as Area Manager for the DOE Los Alamos Area Office.
Approval Line 38	Replaced Mark Wiedler's name with Peter Maggiore's in the NMED Secretary's block	
Introduction Line 56	Identified approval of TWISP Final Safety Analysis Report (FSAR)	Brings Revised Remedial Action Plan (Revised RAP) up to date.
Introduction Lines 59 – 85	Identified the Unreviewed Safety Question Determination (USQD) Program as the change mechanism for the Revised RAP	DOE approved mechanism for limited changes to Transuranic Waste Inspectable Storage Project (TWISP) operational procedures/processes and the TWISP FSAR.
Listed Actions Lines 93 – 122	Segregated Listed Actions Section into *Completed Actions* and *Actions to be Completed*	Brings Revised RAP up to date
Listed Actions Line 114	Eliminated the requirement for construction of Retrieval Dome over Pad 4	Originally, Retrieval Domes were proposed due to concerns over potential airborne radioactive and hazardous constituents from breached containers. Operational experience (gained during retrieval of approximately 4,800 drums from Pad 1) indicates that airborne release of radioactive or hazardous constituents is not a concern during retrieval. To date, less than 10 containers have exhibited breached containment, and airborne concentrations of radioactive and hazardous constituents inside the Retrieval Dome have never exceeded action limits during operations. Additional justification includes negative safety impacts imposed by the structure itself, including reduced access for equipment and personnel to the sides of the waste stack. This option has undergone a USQD to establish whether retrieval operations can be conducted safely without a Retrieval Dome. The USQD process determined that drum/FRP retrieval on Pad 4 could occur without compromising the protection of workers and the environment. As appropriate, mobile enclosures constructed of fabric or plastic can be used in connection with handling potentially damaged drums and or boxes. In the future, non-use of a Retrieval Dome during retrieval operations on Pad 2 may also be evaluated utilizing the USQD process.
Listed Actions Line 117	Removed reference to construction of Storage Dome over Pad 1	The Retrieval Dome over Pad 1 will remain in place for use as a storage dome, and other waste management activities. The removal and replacement of the Retrieval Dome is more difficult than originally estimated; therefore, it is more efficient and cost effective to leave the existing Retrieval Dome over Pad 1 for use as storage.
Listed Actions Line 122	The Retrieval Dome Project has been renamed to be the Retrieval Project	Editorial.

Summary of 1998 Changes/Justification to the 1997 Amended Remedial Action Plan

Section and Line Number(s)	Action	Justification
A. Construction and Retrieval Phasing Lines 129 & 131	The Retrieval Dome Project has been renamed the Retrieval Project	Editorial.
Figure 4	The Retrieval Dome over Pad 4 has been removed.	Originally, Retrieval Domes were proposed due to concerns over potential airborne radioactive and hazardous constituents from breached containers. Operational experience (gained during retrieval of approximately 4,800 drums from Pad 1) indicates that airborne release of radioactive or hazardous constituents is not a concern during retrieval. To date, less than 10 containers have exhibited breached containment, and airborne concentrations of radioactive and hazardous constituents inside the Retrieval Dome have never exceeded action limits during operations. Additional justification includes negative safety impacts imposed by the structure itself, including reduced access for equipment and personnel to the sides of the waste stack. This option has undergone a USQD to establish whether retrieval operations can be conducted safely without a Retrieval Dome. The USQD process determined that drum/FRP retrieval on Pad 4 could occur without compromising the protection of workers and the environment. As appropriate, mobile enclosures constructed of fabric or plastic can be used in connection with handling potentially damaged drums and or boxes. In the future, non-use of a Retrieval Dome during retrieval operations on Pad 2 may also be evaluated utilizing the USQD process.
Figure 5	Retain Retrieval Dome for storage on Pad 1.	The Retrieval Dome over Pad 1 will remain in place for use as a storage dome, and other waste management activities. The removal and replacement of the Retrieval Dome is more difficult than originally estimated; therefore, it is more efficient and cost effective to leave the existing Retrieval Dome over Pad 1 for use as storage.
Figure 6	The Retrieval Dome over Pad 4 has been removed.	Originally, Retrieval Domes were proposed due to concerns over potential airborne radioactive and hazardous constituents from breached containers. Operational experience (gained during retrieval of approximately 4,800 drums from Pad 1) indicates that airborne release of radioactive or hazardous constituents is not a concern during retrieval. To date, less than 10 containers have exhibited breached containment, and airborne concentrations of radioactive and hazardous constituents inside the Retrieval Dome have never exceeded action limits during operations. Additional justification includes negative safety impacts imposed by the structure itself, including reduced access for equipment and personnel to the sides of the waste stack. This option has undergone a USQD to establish whether retrieval operations can be conducted safely without a Retrieval Dome. The USQD process determined that drum/FRP retrieval on Pad 4 could occur without compromising the protection of workers and the environment. As appropriate, mobile enclosures constructed of fabric or plastic can be used in connection with handling potentially damaged drums and or

Summary of 1998 Changes/Justification to the 1997 Amended Remedial Action Plan

Section and Line Number(s)	Action	Justification
		boxes. In the future, non-use of a Retrieval Dome during retrieval operations on Pad 2 may also be evaluated utilizing the USQD process.
1. Storage Domes Lines 143 – 194	Updated to represent current project status	Reflects current status.
1. Storage Domes Lines 150 & 151	Updated to indicate that Retrieval Dome for Pad 1 will remain in place for use as a storage dome which eliminates the need for construction of a storage dome over Pad 1	The Retrieval Dome over Pad 1 will remain in place for use as a storage dome, and other waste management activities. The removal and replacement of the Retrieval Dome is more difficult than originally estimated; therefore, it is more efficient and cost effective to leave the existing Retrieval Dome over Pad 1 for use as storage.
2. Retrieval Dome Lines 196 – 237	Updated to represent current project status	Reflects current status.
2. Retrieval Dome Lines 210 – 213	Eliminated reference to use of Emergency Power Source	It has been determined that the Emergency Power Source (EPS) is not a safety significant piece of equipment as discussed in the Amended Remedial Action Plan (ARAP). In the event of any power outage, retrieval operations will be immediately stopped and personnel will exit the work area until repairs can be accomplished.
2. Retrieval Dome Lines 213 – 215	Eliminate reference to use of curtain partitions	Operational experience has shown the curtain partitions do not add value for workspace segregation.
2. Retrieval Dome Lines 217 & 218	Removed reference to the drum venting system in the Retrieval Dome	Drum venting system is more effectively used in the Drum Prep Facility (TA-54-33), not in the Retrieval Dome.
2. Retrieval Dome Lines 220, 221, 223, 224, 234	Updated to indicate that Retrieval Dome will be maintained on Pad 1 for use as a storage facility and removed reference to relocation of Retrieval Dome from Pad 1 to Pad 4	The Retrieval Dome over Pad 1 will remain in place for use as a storage dome, and other waste management activities. The removal and replacement of the Retrieval Dome is more difficult than originally estimated; therefore, it is more efficient and cost effective to leave the existing Retrieval Dome over Pad 1 for use as storage.
2. Retrieval Dome Lines 225 – 230 and 234 & 235	Added discussion of possible use of retrieval enclosures for Pad's 2 and 4	As discussed above, a Retrieval Dome will not be utilized during retrieval operations on Pad 4 (and may not be used on Pad 2 pending further review and NMED approval). If needed, temporary enclosures may be utilized to safely manage potentially damaged or dangerous containers.
3. Soil Removal Line 241	Eliminate use of wheelbarrows	LANL believes this statement is a level of detail not required in the Revised RAP.
3. Soil Removal Line 245	Identified optional use of support for crates upon removal of the fillet of tuff	In certain cases, adding support to crates can create additional hazards. If the stack is stable, LANL believes this action may not be necessary.
3. Soil Removal Line 247	Removed the text, "several times"	LANL believes this statement is a level of detail not required in the Revised RAP.
4. Waste Package Retrieval Lines 257 – 259	Added equipment typically used during retrieval	Clarification of equipment that may be used.
4. Waste Package Retrieval Line 267	Removed requirement to have detailed information on every container	Workers know the general content (i.e., waste stream type) of waste packages prior to handling.

Summary of 1998 Changes/Justification to the 1997 Amended Remedial Action Plan

Section and Line Number	Change	Justification
4.a Crates Lines 277 – 280	Updated requirements for management of damaged crates	Operational experience has shown that some FRP boxes are too large to place in sea-land containers. Furthermore, LANL believes that FRP boxes can often be stabilized without the use of a sea land container.
4.a Crates Lines 291 – 296	Updated discussion concerning response to crates with liquids	Operational experience has shown that FRP boxes in which no liquids have been detected have not resulted in subsequent liquid release. Crates known to contain liquids will be stored with additional containment. Crates suspected of containing liquids, which might leak, will be stored with additional containment.
4.a Crates Lines 294 – 296	Removed the requirement to place all containers in areas with additional containment	Operational experience has shown that FRP boxes in which no liquids have been detected have not resulted in subsequent liquid release. Crates known to contain liquids will be stored with additional containment. Crates suspected of containing liquids, which might leak will be stored with additional containment.
4.b. Drums Line 298 & 299	Reworded sentence	Editorial.
4.b Drums Lines 300 & 301	Removed the requirement to inspect all drum tops and bottom rims (for separation) prior to retrieval	Safety concerns have been raised in regards to having personnel on the stack to perform this inspection. The visible portions of drum sides and bottom rims will be inspected "in-situ"; however, LANL prefers conducting the remainder of the inspections after containers have been removed from the stack.
4.b Drums Lines 302 & 303	Removed the requirement to reinforce or overpack drums in-situ so that problem drums can be addressed after retrieval from the stack if necessary	Safety concerns have been raised in regards to having personnel on the stack to perform this operation. Therefore, LANL prefers conducting these operations after containers have been removed from the stack.
4.b Drums Lines 303 – 307	Removed the requirement to perform swipe surveys prior to removal from the stack	Safety concerns have been raised in regards to having personnel on the stack to perform these surveys. Therefore, LANL prefers conducting these surveys after containers have been removed from the stack.
4.b Drums Lines 312 – 315	Bar code labeling requirement moved to Section 5, Drum Preparation	Editorial change to identify when operation should occur.
4.b Drums Lines 316 – 320	Included discussion on air monitoring and control of air emissions	Based on experience, LANL believes that air monitoring, coupled with the availability of ventilation systems and temporary Retrieval Enclosures, is sufficient to provide for worker safety and environmental protection.
4.b Drums Lines 322 – 324	Removed requirement for local ventilation	Based on experience, LANL believes that air monitoring, coupled with the availability of ventilation systems and temporary Retrieval Enclosures, is sufficient to provide for worker safety and environmental protection.

Summary of 1998 Changes/Justification to the 1997 Amended Remedial Action Plan

Section and Line Number	[illegible]	[illegible]
4.b Drums Lines 324 & 325	Removed reference to an average removal rate of 24 drums per day	LANL believes this statement is a level of detail not required in the Revised RAP.
4.b Drums Lines 326 – 335	Modified actions for management of drums with liquids	Unless container integrity is compromised, LANL believes that storage of liquids in an area with additional containment is adequate.
4.b Drums Lines 329 – 332	Removed requirement to overpack (with absorbent) all drums confirmed to have liquids, or that contain a waste matrix likely to have liquids	Unless container integrity is compromised, LANL believes that it is not necessary to overpack these containers.
5. Drum Preparation Line 339	Removed requirement to conduct surface radiation survey	A surface radiation survey is better performed prior to removal of waste containers from the retrieval work area (see Section 4.b, Drums).
5. Drum Preparation Lines 340 – 343	Added reference to bar code labeling (removed from Section 4.b, Drums)	Editorial change to identify when labeling should be performed.
5. Drum Preparation Lines 343 & 344	Removed text requiring placement of permanent bar code on drums prior to storage	Editorial change to identify when labeling should be performed.
6. Drum-Venting System Lines 346 – 349 and 353 & 354	Modified criteria for Drum Venting	All drums will be vented to meet disposal facility Waste Acceptance Criteria as applicable.
7. Transportation Lines 359 & 360	Added equipment which may be utilized for package manipulation (drum lifting attachments, booms, cranes with strongbacks or slings)	Clarification of equipment which might be used.
8. Storage Operations Lines 367 & 368	Removed requirement to use propane or diesel fueled forklifts	Allows TWISP to use other safe fuel sources.
8. Storage Operations Line 370	Revised to allow FRP boxes to be stacked two high, at a maximum	LANL believes that FRP boxes with good integrity can be safely stored two high, at a maximum. This is consistent with requirements identified in the *Safety Analysis Report* and the *Proposed Hazardous Waste Facility Permit Modification, Technical Area 54, Area G, Storage Domes 226, 229, 230, 231, 232 and Storage Pads 2 and 4.*
8. Storage Operations Lines 370 & 372	Modified aisle spacing requirements	LANL believes that a minimum 24-inch aisle space provides adequate room to conduct required inspections of containers.
8. Storage Operations Lines 371 & 372	Removed requirement to band drums in groups of 4	LANL believes that banded drums can be safely stored in groups numbering less than four (e.g., two drums banded together, then palletized and placed on the top row).
8. Storage Operations Line 372	Removed reference to metal pallets	LANL believes this statement is a level of detail not required in the Revised RAP.

Summary of 1998 Changes/Justification to the 1997 Amended Remedial Action Plan

[illegible]	[illegible]	[illegible]
8. Storage Operations Lines 373 & 374	Removed reference to larger pallets	LANL believes this statement is a level of detail not required in the Revised RAP.
8. Storage Operations Line 374	Modified to allow stacking of overpack containers up to three high	LANL believes that banded overpack drums (on pallets) can be safely stored up to three rows high.
8. Storage Operations Lines 375 & 376	Clarified where drums confirmed to contain liquids will be stored	Editorial change to identify where liquids should be stored.
8. Storage Operations Line 377	Modified requirement to update TRU waste database whenever waste packages are moved	While it is important to track waste storage locations, LANL believes it is unnecessary to update the TRU waste database for every waste package move (e.g., when drums are moved from one stack in a particular storage dome to another stack inside the same dome).

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Los Alamos

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Date: July 27, 1998

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AUG 1998 RECEIVED

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RE: COMPLIANCE ORDER 98-03

Please find enclosed the original Answer to Administrative Compliance Order HRM 98-03 and Request for Hearing, along with Attachment A and the accompanying Exhibits A - G and the signed Certificate of Service.

Sincerely,

Sheila Brown
Staff Attorney

Cys: Nick Persampieri, NMED
Carol Dinkins, Vinson & Elkins
Joyce Laeser, LAAO, A316
Frank Dickson, LC, A183
LC/GL
(File)

TC

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STATE OF NEW MEXICO
ENVIRONMENT DEPARTMENT

IN THE MATTER OF
THE UNITED STATES DEPARTMENT OF ENERGY
AND THE REGENTS OF THE UNIVERSITY OF CALIFORNIA
LOS ALAMOS, NEW MEXICO
NM0890010515

COMPLIANCE ORDER
HRM-98-03 (CO)

JUL 1998
DOCKETED BY THE HEARING CLERK BEFORE THE SECRETARY OF ENVIRONMENT

ANSWER TO ADMINISTRATIVE COMPLIANCE ORDER AND REQUEST FOR HEARING

The University of California ("UC" or "Respondent") submits this answer to Compliance Order HRM-98-03 ("Order").

FINDINGS

1. Respondent admits the findings contained in Paragraphs 1, 2, 3, 4, 5, and 6.

2. Respondent objects to the use of the term "at all material times" in Paragraph 7 because it is vague and ambiguous in the context of this Order. The Order does not define this term, and the Order does not provide any indication regarding the "material" time period. Respondent admits that the Los Alamos National Laboratory ("LANL") has since the Fall of 1993,[1] with a few possible exceptions, generated more than 1000 kilograms of hazardous waste per month and stored in excess of 6000 kilograms of hazardous waste on site. Except as specifically admitted above, all other findings contained in Paragraph 7 are denied.

3. With regard to the findings contained in Paragraph 8, Respondent admits that the Los Alamos County Landfill is located in or near Los Alamos, New Mexico, on land owned by Respondent, the Department of Energy ("DOE"). Upon information and belief, however, Respondent affirmatively states that Respondent DOE does not own the landfill. The landfill is owned and operated by Los Alamos County based on a special use permit issued by Respondent DOE.

4. With regard to the findings contained in Paragraph 9, Respondent admits that solid waste has been disposed of in the Los Alamos County Landfill. Respondents are without knowledge or information sufficient to form a belief as to the truth or falsity of the finding that the Los

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[1] This date corresponds to the approximate date that Respondent initiated discussion with the New Mexico Environment Department ("NMED") regarding the need for a storage dome for mixed waste in TA-54, Area L.

Alamos County Landfill "contains cells" into which solid waste has been disposed, and therefore denies same.

5. With regard to the findings contained in Paragraph 10, Respondent admits that fill has been placed in a pile that also contains rubble located in the vicinity of (or close to) the Los Alamos County Landfill (hereafter this pile is referred to as the "Land Bridge").[2] Upon information and belief, Respondent states that asphalt from Los Alamos County in general has been placed in the Land Bridge. Respondent objects to the use of the term "other materials" in this finding because it is vague and ambiguous. Respondent is without knowledge or information sufficient to form a belief as to the truth or falsity of the finding that (i) the Land Bridge is "adjacent and contiguous" to the landfill; (ii) the landfill contains "solid waste disposal cells," and (iii) the Land Bridge contains "other materials," and therefore denies same. Except as specifically admitted above, the findings contained in Paragraph 10 are denied.

6. Respondent admits the findings contained in Paragraphs 11 and 12.

7. With regard to the findings contained in Paragraph 13, Respondent admits that the Permit (as that term is defined in Paragraph 12 of the Order) authorizes Respondent to incinerate, treat, and store hazardous wastes identified in the Permit at Attachment G, in accordance with the terms and conditions of the permit. All other findings contained in Paragraph 13 not specifically admitted above are denied.

8. Respondent admits the findings contained in Paragraph 14, but affirmatively states that no such non-compliance has occurred as alleged by NMED in the Order.

9. Respondent admits the findings contained in Paragraphs 15 and 16.

10. With regard to the findings contained in Paragraph 17, Respondent admits that pits and shafts into which wastes have been disposed are located at TA-54, including a pit in Area L known as "Pit A," and a pit located in Area G know as "Pit 37." Respondent objects to the use of the term "other areas" in this finding because it is vague and ambiguous. Because Respondent does not know what "other areas" refers to in this Paragraph, Respondent is without knowledge or information sufficient to form a belief as to the truth or falsity of the finding that TA-54 contains "other areas" into which wastes have been disposed, and therefore denies same.

11. With regard to the findings contained in Paragraph 18, Respondent objects to the use of the term "hazardous waste or mixed hazardous and radioactive waste" because it is ambiguous and confusing. Respondent has assumed in answering the Order that this term means "hazardous waste" (as defined by 40 C.F.R. § 261.3) and "mixed waste" (as defined by 42

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[2] The "Land Bridge" is referred to as the "Rubble Pile" in the Order.

U.S.C. § 6903(41)). Subject to and without waiving the above objection, Respondent admits the findings in Paragraph 18.

12. Respondent admits the findings contained in Paragraph 19, and affirmatively states that in the 1980 Part A application Respondent asserted that the jurisdiction and regulatory authority of both NMED and the U.S. Environmental Protection Agency ("EPA") over any such mixed wastes had not been established.

13. Respondent admits the findings contained in Paragraph 20.

14. With regard to the findings contained in Paragraph 21, Respondent admits that Pit 37 was excavated in 1990. Except as specifically admitted above, all findings in Paragraph 21 are denied.

15. Respondent admits the findings contained in Paragraphs 22, 23, and 24.

16. With regard to the findings contained in Paragraph 25, Respondent admits that Pit 37 is a low level radioactive waste disposal pit that contains radioactive waste in a solid form only. Except as specifically admitted above, all findings in Paragraph 25 are denied.

17. Respondent admits the findings contained in Paragraph 26.

18. Subject to Respondent's objection and clarification in Paragraph 11 of this Answer regarding the meaning of the term "hazardous waste and mixed hazardous and radioactive waste," Respondent admits the findings contained in Paragraph 27.

19. With regard to the findings contained in Paragraph 28, Respondent is without knowledge or information sufficient to form a belief as to the truth or falsity of the findings in this Paragraph, and accordingly denies all findings contained in this Paragraph.

20. With regard to the findings contained in Paragraph 29, Respondent is without knowledge or information sufficient to form a belief as to the truth or falsity of the findings in this Paragraph, and accordingly denies all findings contained in this Paragraph.

21. With regard to the findings contained in Paragraph 30, Respondent is without knowledge or information sufficient to form a belief as to the truth or falsity of the findings in this Paragraph, and accordingly denies all findings contained in this Paragraph.

22. With regard to the findings contained in Paragraph 31, Respondent admits that—for hazardous wastes that is managed at any one of the LANL hazardous waste treatment, storage, or disposal units—Respondents must follow the procedures for waste analysis described in the Waste Analysis Plan, attached to the Permit as Attachment A. Respondent affirmatively states also that in Respondent's capacity as a generator of solid waste it may

determine that a solid waste is not a hazardous waste pursuant to the standards in 40 C.F.R. § 262.11—including applying knowledge of the waste based on "process knowledge" of the source and likely hazardous constituents present in the waste. Except as specifically admitted above, all findings contained in Paragraph 31 are denied.

23. With regard to the findings contained in Paragraph 32, Respondent admits that NMED inspected LANL in 1992 and issued Respondent and DOE a compliance order that assessed civil penalties. Respondent also admits that violations as described in this Paragraph were alleged by NMED in the referenced compliance order, and that a number of these violations were or may have been admitted by Respondent or DOE or both Respondent and DOE. Respondent, however, denies that all of the violations alleged by the referenced compliance order were admitted by Respondents, or that all the alleged violations constituted actual violations. Respondent also affirmatively states that the civil penalties actually paid in settlement of the alleged non-compliance may have been less than the amount originally assessed in the referenced compliance order.

24. With regard to the findings contained in Paragraph 33, Respondent admits that NMED inspected LANL in 1993 and issued Respondent and DOE a compliance order that assessed civil penalties. Respondent also admits that violations as described in this Paragraph were alleged by NMED in the referenced compliance order, and that a number of these violations were or may have been admitted by Respondent or DOE or both Respondent and DOE. Respondent, however, denies that all of the violations alleged by the referenced compliance order were admitted by Respondents, or that all the alleged violations constituted actual violations. Respondent also affirmatively states that the civil penalties actually paid in settlement of the alleged non-compliance may have been less than the amount originally assessed in the referenced compliance order.

25. With regard to the findings contained in Paragraph 34, Respondent admits that NMED inspected LANL in 1994 and issued Respondent and DOE a compliance order that assessed civil penalties. Respondent also admits that violations as described in this Paragraph were alleged by NMED in the referenced compliance order, and that a number of these violations were or may have been admitted by Respondent or DOE or both Respondent and DOE. Respondent, however, denies that all of the violations alleged by the referenced compliance order were admitted by Respondents, or that all the alleged violations constituted actual violations. Respondent also affirmatively states that the civil penalties actually paid in settlement of the alleged non-compliance may have been less than the amount originally assessed in the referenced compliance order.

26. With regard to the findings contained in Paragraph 35, Respondent admits that NMED inspected LANL in 1995 and issued Respondent and DOE a compliance order that assessed civil penalties. Respondent also admits that violations as described in this Paragraph were alleged by NMED in the referenced compliance order, and that a number of these violations were or may have been admitted by Respondent or DOE or both Respondent and DOE.

Respondent, however, denies that all of the violations alleged by the referenced compliance order were admitted by Respondents, or that all the alleged violations constituted actual violations. Respondent also affirmatively states that the civil penalties actually paid in settlement of the alleged non-compliance may have been less than the amount originally assessed in the referenced compliance order.

27. With regard to the findings contained in Paragraph 36, Respondent admits that NMED inspected LANL in 1996 and issued Respondent a letter of violation. Respondent also admits that violations as described in this Paragraph were alleged by NMED in the referenced letter of violation. Respondent, however, denies that all of the violations alleged by the referenced letter of violation were admitted by Respondents, or that all the alleged violations constituted actual violations.

28. With regard to the findings contained in Paragraph 37, Respondent admits that the referenced compliance orders and letter of violation when taken together include alleged violations similar to those described in Paragraph 37. Respondent denies, however, that each such compliance order or letter of violation contained every alleged violation described in Paragraph 37.

29. With regard to the findings contained in Paragraph 38, Respondent admits that Compliance Order 94-12 alleged that Respondent "failed to acquire the appropriate permit for the disposal of hazardous/mixed waste" removed from Solid Waste Management Unit ("SWMU") 3-010[a] (Building 30, Technical Area 3). Respondent also admits that Compliance Order 94-12 alleges that Respondent disposed of waste containing 1,1,1-trichloroethane and trichloroethylene in Pit 37. Except as specifically admitted above, Respondent denies all findings in this Paragraph. Respondent also affirmatively states that the soil that was the subject of Compliance Order 94-12 contained trace amounts of volatile organics, i.e., 1,1,1-trichloroethane and trichloroethylene, which when discarded may constitute listed hazardous wastes, but denies that the presence of trace amounts of the trace amounts of these two constituents in the soil necessarily rendered the soil a hazardous waste.

30. Respondent admits the findings contained in Paragraph 39.

31. With regard to the findings contained in Paragraph 40, Respondent admits that it proposed to construct a storage dome located partially over the top of the Pit A SWMU. Respondent denies that the Pit A SWMU had been "capped with an asphalt pad." Respondent affirmatively states that, prior to construction of the storage dome, an asphalt pad was constructed on top of Pit A as a pad on which to store waste as well as to facilitate vehicle traffic in the area (hereafter this old pad that was demolished as part of the construction of the mixed waste storage dome is referred to as "Pad A," the new pad constructed as part of the mixed waste storage dome is referred to as "Pad AA"). Construction of Pad A was unrelated to the underlying SWMU and was not intended as a "cap" for Pit A or any other

SWMU closure activity. Furthermore, Respondent affirmatively states that the Pit A SWMU was situated beneath Pad A, and physically separated from it by several feet of soil.

32. With regard to the findings contained in Paragraph 41, Respondent admits that the solid wastes disposed of in Pit A included aniline dye, boric acid, potassium cyanide, trichloroethylene and other spent solvents, and metals. Respondent also admits that some of these wastes, if generated today, would be regulated under current federal and state law, but denies that such wastes were so regulated at the time of disposal. Respondent also affirmatively states that the wastes disposed of in Pit A were placed in this SWMU prior to the enactment of the New Mexico Hazardous Waste Act and the federal Resource Conservation and Recovery Act ("RCRA"), 42 U.S.C. §§ 6901 *et seq.* As a result, solid wastes placed within Pit A were and are exempt from management and disposal standards that are otherwise applicable to currently-generated wastes. Except as specifically admitted above, the findings in Paragraph 41 are denied.

33. With regard to the findings contained in Paragraph 42, Respondent admits the findings in the first sentence of this Paragraph. With respect to the second and third sentences of this paragraph, Respondent admits that the analyses for volatile organic compounds, conducted during April 1994, detected trace quantities of 1,1,1 trichloroethane and trichloroethylene in asphalt and soil samples collected from Pad A prior to its demolition (the "Analyses"). Respondent specifically denies that the Analyses indicated that the asphalt and soil was *contaminated* with volatile organic compounds or hazardous waste. Respondent affirmatively states that the Analyses did not demonstrate that the asphalt or soils were a hazardous waste or contained hazardous waste. Respondent admits that the likely source of the trace quantities of 1,1,1 trichloroethane and trichloroethylene in the asphalt samples was pore gas present below Pad A. Respondent also admits that the most likely source of the 1,1,1 trichloroethane and trichloroethylene in the pore gas is the wastes disposed of in Pit A and the disposal shafts. Except as specifically admitted above, Respondent denies all findings in Paragraph 42.

34. With regard to the findings contained in Paragraph 43, Respondent admits that it knew the wastes specifically identified in Paragraph 41 of the Order were disposed of in Pit A. Beyond the wastes specifically identified in Paragraph 41, Respondent objects to the reference in this finding to "numerous wastes" because this language is vague and ambiguous.

35. a. With regard to the findings contained in Paragraph 44, Respondent denies that the asphalt and soil from the waste storage dome construction site was transported directly to Pit 37 and the Land Bridge. Upon information and belief, Respondent affirmatively states as follows with regard to the disposition of the demolished asphalt and associated soil removed as part of the construction of the waste storage dome.

b. Beginning in May through the middle of June of 1995, Pad A was broken up, crushed, used to fill low-lying areas on the north and west sides of Pad A, and compacted in

place. The primary access point for these construction activities was the south side of Pad A across an asphalt-covered shallow swale. This swale was not part of Pad A, but rather was separated from the pad by a curb. The heavy vehicle traffic across the asphalt swale caused substantial damage to this surface, and Respondent determined that this surface should also be replaced in conjunction with pouring the pad for the new waste storage dome. These construction activities included breaking up the asphalt from within the swale area, crushing the asphalt, using it to fill areas on the north and west sides of Pad A, and compaction in place.

c. Nevertheless, not all of the asphalt from the swale could be reused as fill, and on June 15, 1995, Respondent transported approximately 30-40 cubic yards of excess asphalt and soil from the swale part of Area L to the site where the Area G compactor building has since been constructed. Over the next year or so, additional asphalt and soil from other areas of LANL were combined with the asphalt and soil taken from the swale. Portions of this mixture of material were ultimately transported to Pit 37 and the Land Bridge.

d. Respondent admits that it did not analyze the demolished asphalt and asphalt and soil removed as part of construction of the waste storage dome for substances other than volatile organic compounds before reusing the asphalt and soil as fill for the storage dome construction, or—in the case of the 30-40 cubic yards removed from the swale—before transporting the asphalt and soil to Area G. Upon information and belief, Respondent affirmatively states that it had sufficient process knowledge to determine pursuant to 40 C.F.R. § 262.11 that analytical testing for semi-volatiles and non-volatiles hazardous constituents was not necessary. The Pit A SWMU was located beneath Pad A and the swale, and Pit A was separated from the asphalt by several feet of dirt. The only potential mass-transport pathway between the SWMU and the asphalt was via vaporization and adsorption. Moreover, because only the volatile constituents in the SWMU have a sufficiently high vapor pressure to vaporize in significant amounts, these were the only constituents of concern necessary for the analysis of the asphalt. Because there was (and is) no basis to conclude that non-volatile and semi-volatile constituents in the SWMU will migrate upwards, testing for these constituents in the asphalt and soil was unnecessary. In addition, NMED approved the use of the asphalt overlying Pit A as fill using the analytical data provided by Respondent. These data included only volatile organic constituent analyses. NMED did not require analysis of any additional constituents prior to its approval. Finally, if the asphalt and soil were a solid waste (which Respondent denies), they were debris as defined by 40 C.F.R. § 269.2(g), and as a result, an approved sampling methodology was not available. Except as specifically admitted above, the findings contained in Paragraph 44 are denied.

36. Respondent admits the findings contained in Paragraph 45 and 46.

37. With regard to the findings contained in Paragraph 47, Respondent denies that one of the conditions of NMED's conditional approval of the construction of the waste storage dome was that Respondents treat and/or dispose of all waste asphalt removed from the *construction site* as hazardous waste. Respondent admits that the conditional approval letter specified that "all waste asphalt removed from the existing pad must be treated and/or disposed of as a hazardous waste." Upon information and belief, Respondent affirmatively states that the "pad" referred to in this portion of the conditional approval refers to Pad A, and does not refer to any other area.

38. With regard to the findings contained in Paragraph 48, Respondent admits that in July and August 1994, Respondents performed a utility upgrade of Area L in the same general vicinity as the proposed waste storage dome. Except as specifically admitted above, the findings contained in Paragraph 48 are denied.

39. With regard to the findings contained in Paragraph 49, Respondent admits that the utility upgrade generated approximately 67,000-76,000 pounds of waste in a solid form or debris consisting primarily of waste asphalt and soil. Moreover, Respondent admits that it managed and disposed of this waste as a hazardous waste. Respondent denies, however, that the solid waste was hazardous or that it had to be managed as a hazardous waste. Except as specifically admitted above, the findings in Paragraph 49 are denied.

40. With regard to the findings contained in Paragraph 50, Respondent admits that it manifested and shipped waste, including asphalt and soil, that was generated in the utility upgrade of Area L on August 30, September 15, and November 9, 1994. Respondent also admits that this waste was transported to Rollins Environmental Services, Deer Park, Texas for disposal. Respondent denies, however, that this waste was hazardous.

41. With regard to the findings contained in Paragraph 51, Respondent admits that it demolished Pad A during approximately May and June of 1995, and demolished the asphalt over the adjacent swale in or around June of 1995. The swale was demolished after the material from Pad A was used for fill under the eventual location of Pad AA, but prior to laying any asphalt for Pad AA. Both of these areas are near or located above the Pit A SWMU, and both projects were conducted in conjunction with construction of the waste storage dome. With the exception of the approximately 30-40 cubic yards of material taken from the swale described in Paragraph 35 of this answer, Respondent denies that any asphalt and soil was "removed" from the construction area. Moreover, as described in greater detail in Respondent's affirmative defenses, Respondent denies both that the demolished asphalt and soil is a hazardous waste and that this material was contaminated.

42. With regard to the findings contained in Paragraph 52, Respondent admits that the asphalt and soil demolished from Pad A and the adjacent swale area was crushed and used as fill in the construction of the waste storage dome. Respondent denies that it stockpiled the asphalt and soil for any significant period of time prior to its use as fill with the limited exception of the

approximately 30-40 cubic yards of material taken from the swale described in Paragraph 35. Moreover, as described in greater detail in Respondent's affirmative defenses, Respondent denies both that the demolished asphalt and soil is a hazardous waste and that this material was contaminated.

43. With regard to the findings contained in Paragraph 53, Respondent admits that NMED verbally authorized Respondent to utilize the demolished asphalt and soil removed from the area of the SWMU as backfill material in the waste storage dome construction. Respondent admits that this verbal authorization did not include the removal of any solid wastes from Area L to be used as backfill material anywhere else. Respondent admits that the July 22, 1994 letter from NMED specified that demolished asphalt from Pad A, if it were disposed of, was required to be managed and disposed of as a hazardous waste. Respondent denies that the scope of the restriction in the July 22, 1994 letter explicitly extended to asphalt demolished in the adjacent swale area. Moreover, as described in greater detail in Respondent's affirmative defenses, Respondent denies both that the demolished asphalt and soil is a hazardous waste and that this material was contaminated.

44. With regard to the findings contained in Paragraph 54, Respondent admits that approximately 30-40 cubic yards of demolished asphalt and soil from the swale area was not used as backfill and remained after the construction of the waste storage dome. Respondent affirmatively states that all of the demolished asphalt from Pad A was used as backfill and none of the material from Pad A remained after the construction of the waste storage dome. Moreover, as described in greater detail in Respondent's affirmative defenses, Respondent denies both that the demolished asphalt and soil is a hazardous waste and that this material was contaminated.

45. With regard to the findings contained in Paragraph 55, Respondent admits that on or about June 15, 1995, Respondent transported approximately 30-40 cubic yards of demolished asphalt from the swale area to Area G under the direction of the then-Area L Group Leader and placed this material in a stockpile (hereafter referred to as the "Area G Stockpile"). Respondent denies that the "Area L manager" directed this transport because the individual's correct title is "Group Leader." Moreover, as described in greater detail in Respondent's affirmative defenses, Respondent denies both that the demolished asphalt and soil is a hazardous waste and that this material was contaminated. Finally, Respondent affirmatively states that the then-Area L Group Leader offered the demolished asphalt and soil to the then-Group Leader of the Solid Radioactive Waste Group (CST-14) with the understanding that it was to be used to build a floor in and/or around the compactor building. The then-Area L Group Leader judged that sending the asphalt to Area G did not constitute disposal and was within the scope of the understanding between NMED and Respondent with regard to the reuse of fill material. At no time did he believe that the transport of the demolished asphalt and soil to CST-14 involved a solid waste or a hazardous waste.

46. Respondent admits the findings contained in Paragraph 56 with the clarification that the actual amount in the Area G Stockpile may have been several times greater than 300 cubic yards. Until the material in the Area G Stockpile was removed from Area G and measured for purposes of manifesting this material, the exact amount in the Area G Stockpile was not known. The 300 cubic yard estimate may have been an early estimate as to the size of the pile by Respondent's personnel. Respondent now believes that the Area G Stockpile may have been as large as 1300 cubic yards.

47. With regard to the findings contained in Paragraph 57, Respondent admits that approximately during the second week of April 1996, Respondent transported approximately 60 cubic yards of the Area G Stockpile (as described in Paragraph 56 of this Order) to the Los Alamos County Landfill. As described in greater detail in Respondent's affirmative defenses, Respondent denies both that the material stored in the Area G Stockpile was a hazardous waste and that this material was contaminated. Respondent also affirmatively states that it is without knowledge or information sufficient to form a belief as to the truth or falsity of the finding that the "mixture" referenced in Paragraph 57 contained demolished asphalt and soil transported from Area L.

48. For purposes of responding to Paragraph 58, Respondent has assumed that the "mixture" referenced in this finding refers to the Area G Stockpile described in Paragraph 56 of this Order. Based on this assumption, Respondent admits that during approximately the third week of April 1996, Respondent transported and placed in Pit 37, Area G, approximately 225 cubic yards of this mixture. Respondent denies that it "disposed" of the mixture in Pit 37. Respondent also affirmatively states that it is without knowledge or information sufficient to form a belief as to the truth or falsity of the finding that the "mixture" referenced in Paragraph 58 contained demolished asphalt and soil transported from Area L.

49. With regard to the findings contained in Paragraph 59, Respondent admits that it transported and placed fill material from the Area G Stockpile, which consisted primarily of asphalt and soil, in the Land Bridge at the Los Alamos County Landfill. Respondent also admits that the Land Bridge is located above a sanitary sewer outfall, which flows intermittently and which is authorized pursuant to the federal Clean Water Act (Permitted Outfall 13-S). Under normal operation, this sanitary sewer discharge does not receive any flow. The wastewater discharge for the Power Plant (Permitted Outfall 001) discharges above the Land Bridge. As described in greater detail in Respondent's affirmative defenses, Respondent denies that the fill material placed in the Land Bridge was a hazardous waste. Respondent also denies that it disposed of the fill material in the Land Bridge. Respondent is without knowledge or information sufficient to form a belief as to the truth or falsity of the finding that there is a wetland such as would be subject to jurisdiction under the federal Clean Water Act in Sandia Canyon below the Land Bridge.

50. Respondent denies all of the findings contained in Paragraph 60, and affirmatively states that the analytical characterization and process knowledge information available prior to

placement of the asphalt and soil fill in Pit 37 and the Area G Stockpile was sufficient to determine that this material was not a hazardous waste pursuant to 40 C.F.R. § 262.11. Respondent also affirmatively states that subsequent investigation of Pit 37 and the Land Bridge, which included comprehensive analytical testing, confirmed that the asphalt and soil fill was not a hazardous waste. This data is summarized in Respondent's "Area G Asphalt Sampling and Analysis Project Results" dated March 18, 1998, which was previously provided by Respondent to NMED.

51. Respondent denies all of the findings contained in Paragraph 61, and affirmatively states that the Waste Analysis Plan was not applicable to the transport and placement of the asphalt and soil fill in Pit 37 and the Land Bridge. The Waste Analysis Plan was not applicable because (i) Respondent possessed sufficient information to determine pursuant to 40 C.F.R. § 262.11 (as the generator) that the asphalt and soil was not a hazardous waste, and (ii) Respondent was not required to manage the asphalt and soil at any one of the LANL hazardous waste treatment, storage, or disposal units subject to the permit. Finally, Respondent affirmatively states that NMED did not require analysis of any additional constituents prior to issuing its verbal approval to reuse the asphalt and soil as fill. Instead, NMED approved the use of the asphalt overlying Pit A as fill based only on the analytical data provided by Respondent. These data included only volatile organic constituent analyses.

52. Respondent denies all of the findings contained in Paragraph 62, and affirmatively states that the land disposal restrictions in 40 C.F.R. part 268 are not applicable because the asphalt and soil was not a hazardous waste.

53. With regard to the findings contained in Paragraph 63, Respondent admits that it did not prepare a manifest for the asphalt and soil fill transported to the Los Alamos County Landfill and that a manifest did not accompany the asphalt and soil fill transported to the Landfill. Respondent, however, denies that the asphalt and soil fill transported to the Landfill was a hazardous waste, and affirmatively states that a manifest was not required for this transport of non-hazardous fill material. Respondent also denies that the asphalt and soil fill transported to the Landfill was contaminated.

54. Respondent denies all of the findings contained in Paragraph 64. Respondent also affirmatively states that the only analysis that it is aware of with regard to the potential for harm to human health and environment is the risk-based analysis prepared by Respondent with respect to the placement of asphalt and soil at both Pit 37 and the Land Bridge. Contrary to NMED's assertion in this Paragraph, this risk assessment concludes that there is not a significant risk of harm to either human health or the environment from these disposal activities. *See* "Area G Asphalt Sampling and Analysis Project Results" dated March 18, 1998 (previously supplied to NMED).

CONCLUSIONS

55. Respondent admits the conclusions contained in Paragraphs 65, 66, 67, and 68.

56. Respondent admits the conclusions contained in Paragraph 69, except that Respondent denies that Respondents engage in the disposal of hazardous waste on-site.

57. With regard to the conclusions contained in Paragraph 70, Respondent admits that it is a generator of hazardous waste. Respondent denies that 1,1,1 trichloroethane and trichloroethylene are hazardous wastes. Respondent admits that certain listed spent solvent hazardous wastes may include spent solvents containing 1,1,1 trichloroethane and/or trichloroethylene (for example listed wastes F001 and F002). Respondent also admits that discarded commercial formulations of trichloroethylene (U228) may also be a hazardous waste. Finally, Respondent admits that solid wastes that exhibit the toxicity characteristic based on a measured concentration of trichloroethylene above 0.5 mg/liter as measured by the Toxicity Characteristic Leaching Procedure may also be a hazardous waste. Respondent admits that 40 C.F.R. § 260.10 is incorporated by reference into 20 N.M.A.C. 4.1.101 and that 40 C.F.R. part 262 is incorporated by reference into 20 N.M.A.C. 4.1.300.

58. Respondent denies all of the conclusions contained in Paragraph 71, except that Respondent admits that 40 C.F.R. § 262.11 is incorporated by reference into 20 N.M.A.C. 4.1.300.

59. Respondent denies all of the conclusions contained in Paragraph 72, except that Respondent admits that 40 C.F.R. § 264.13 is incorporated by reference into 20 N.M.A.C. 4.1.500. Respondent also affirmatively states that the waste sampling requirements in the Permit and 40 C.F.R. § 264.13 do not apply to the demolished asphalt and soil, because Respondent determined (pursuant to 40 C.F.R. § 262.11), based on process knowledge as well as analytical testing, that the demolished asphalt and soil was not a hazardous waste. Even if the Permit and 40 C.F.R. § 264.13 waste analysis requirements apply, which Respondent denies, these provisions do not require any "detailed chemical and physical analyses of a representative sample of the waste asphalt and soils" beyond those conducted by the Respondent. Moreover, these provisions permitted the use of knowledge of process to properly characterize the waste. Finally, whether analyzed under 40 C.F.R. § 262.11 or the Permit, Respondent had sufficient knowledge of process and analytical test results to adequately determine that the demolished asphalt and soil was not a hazardous waste and did not contain a hazardous waste.

60. Respondent denies all of the conclusions contained in Paragraph 73, except that Respondent admits that 40 C.F.R. § 268.7 is incorporated by reference into 20 N.M.A.C. 4.1.800. Respondent also affirmatively states that the land disposal restrictions in 40 C.F.R. § 268.7 are not applicable because the asphalt and soil was not a hazardous waste.

61. With regard to the conclusions contained in Paragraph 74, Respondent denies that asphalt and soil was removed from the construction site of the waste storage dome, with the exception of the 30-40 cubic yards of material from the swale area (as described in Paragraph 35 above). Respondent denies that the 30-40 cubic yards removed from the swale area "contained solid wastes as defined by N.M.S.A. § 74-4-3(M) and 40 C.F.R. § 261.2." Respondent admits that 40 C.F.R. § 261.2 is incorporated by reference into 20 N.M.A.C. 4.1.200. Except as specifically admitted above, the remaining conclusions contained in Paragraph 74 are denied.

62. Respondent denies all of the conclusions contained in Paragraph 75, except that Respondent admits that 40 C.F.R. part 261 is incorporated by reference into 20 N.M.A.C. 4.1.200.

63. Respondent denies all of the conclusions contained in Paragraphs 76 and 77 with the following exceptions. Respondent admits that it did not prepare a manifest for approximately 60 cubic yards of asphalt and soil transported from the Area G Stockpile to the Los Alamos County Landfill, and accordingly that transport of this material was not accompanied by a manifest. Respondent also admits that 40 C.F.R. §§ 262.20(a)-(b), 262.22, and 262.23(a)-(b) are incorporated by reference into 20 N.M.A.C. 4.1.300 and that 40 C.F.R. § 263.20 is incorporated by reference into 20 N.M.A.C. 4.1.400. Respondent affirmatively states that a manifest was not necessary for the transport of approximately 60 cubic yards of asphalt and soil from the Area G Stockpile to the Los Alamos County Landfill because this material was not a hazardous waste.

64. Respondent denies all of the conclusions contained in Paragraph 78 with the following exceptions. Respondent admits that 40 C.F.R. § 262.12(c) is incorporated by reference into 20 N.M.A.C. 4.1.300. Upon information and belief, Respondent affirmatively states that it is without knowledge or information sufficient to form a belief as to the truth or falsity of the conclusion that the Los Alamos County Landfill does not have an EPA Identification Number, is not permitted, and does not have interim status to dispose of hazardous waste. Accordingly, Respondent denies these conclusions.

65. Respondent denies all of the conclusions contained in Paragraph 79 with the following exceptions. Respondent admits that it placed approximately 225 cubic yards of non-hazardous asphalt and soil from the Area G Stockpile in Pit 37. Respondent also admits that Pit 37 does not possess a permit or interim status authorization pursuant to N.M.S.A. § 74-4-4(A)(6) and 40 C.F.R. part 270. Respondent also admits that 40 C.F.R. part 270 is incorporated by reference into 20 N.M.A.C. 4.1.900.

66. Respondent denies all of the conclusions contained in Paragraph 80, except that Respondent admits that 40 C.F.R. part 270 is incorporated by reference into 20 N.M.A.C. 4.1.900.

67. Respondent denies all of the conclusions contained in Paragraph 81, except that Respondent admits that 40 C.F.R. § 270.1(c) is incorporated by reference into 20 N.M.A.C. 4.1.900. Respondent also affirmatively states that the post-closure permit requirements in 40 C.F.R.

§ 270.1(c) only apply to the disposal of hazardous wastes, and that Respondent has not disposed of any hazardous wastes in the Los Alamos County Landfill.

68. Respondent denies all of the conclusions contained in Paragraph 82. Respondent also affirmatively states, upon information and belief, that there is no significant risk to human health or the environment posed by the placement of approximately 60 cubic yards of asphalt and soil from the Area G Stockpile in the Land Bridge at the Los Alamos County Landfill.

69. Respondent denies that any viable alleged violations have been set forth in this Compliance Order, and accordingly affirmatively states that the high priority violator provisions of 20 N.M.A.C. 4.1 are not applicable.

FIRST AFFIRMATIVE DEFENSE

Respondent's answer and each denial or affirmative statement contained therein constitutes Respondent's first affirmative defense.

SECOND AFFIRMATIVE DEFENSE

All of the violations alleged by NMED are predicated on a finding that the approximately 30-40 cubic yards of asphalt and soil that was transported from the swale adjacent to the mixed waste dome to the Area G Stockpile was a solid waste. Respondent's second affirmative defense is that the asphalt and soil removed from the swale area were not a solid waste as defined by 40 C.F.R. § 261.2.

THIRD AFFIRMATIVE DEFENSE

All of the violations alleged by NMED are predicated on a finding that the approximately 30-40 cubic yards of asphalt and soil that was transported from the swale adjacent to the mixed waste dome to the Area G Stockpile was a hazardous waste. Respondent's third affirmative defense is that the asphalt and soil removed from the swale area was not a hazardous waste. As an initial matter, Respondent affirmatively states that the asphalt and soil from the swale area did not exhibit a hazardous waste characteristic as defined in 40 C.F.R. part 261 subpart C, nor is this waste listed as a hazardous waste in 40 C.F.R. part 261 subpart D. Regardless, NMED has alleged that the asphalt and soil should have been managed as a hazardous waste because of the trace VOC constituents that presumably were adsorbed into the asphalt from pore gas emanating from Pit A and/or the Disposal Shafts. NMED's allegation is apparently based on the view that the asphalt and soil are a listed hazardous waste because the listing that applies to the wastes disposed of in Pit A and/or the Disposal Shafts "carries through" via the pore gas, and attaches to the asphalt when the pore gas adsorbs onto this media. Although not clearly articulated in the Order, it appears that NMED's allegation relies on one or more of the following to reach this conclusion: (1) the "mixture rule," (2) the "derived-from rule," or (3) the "contained-in" policy. Respondent affirmatively states that these three rules do not support a finding that the asphalt and soil is a hazardous waste or should be managed as a hazardous waste.

As a threshold matter, the pore gas clearly was never a solid waste because it meets the definition of an "uncontained gas" and thus is exempted from the definition of solid waste under the Resource Conservation and Recovery Act ("RCRA"). 42 U.S.C. § 6903(27). Because the pore gas is not a solid waste, it cannot be a listed hazardous waste. Accordingly, the hazardous waste "listing" that otherwise might attach to the wastes disposed of in Pit A and the disposal shafts does not apply to the pore gas or any material that subsequently contains trace quantities of the pore gas. This listing does not carry forward, but rather is severed once the chemical constituents are no longer a solid waste. This fundamental concept is reinforced by examination of the specific application of the mixture rule, derived-from rule, and contained-in policy in the context of this factual scenario.

Under the mixture rule, a solid waste is a hazardous waste if it is mixed with one or more listed hazardous wastes. 40 CFR § 261.3(a)(2)(iv). In order for the mixture rule to apply, two or more *solid wastes* must be mixed or somehow combined together, and one of those solid wastes must also be a hazardous waste. *Id.*; *see also*, *Shell Oil Co. v. EPA*, 950 F.2d 741, 749 (D.C. Cir. 1991); *United States v. Johnson*, 886 F.Supp. 1057, 1067 (W.D.N.Y. 1995) (holding that the mixture rule does not apply to a mixture of a solid waste and water because "it does not appear that ordinary water is a 'solid waste' under the definitions in the RCRA regulations"). In the instant case, neither the pore gas nor the asphalt pad were a solid waste at the time that these two materials were combined. As noted above, the pore gas was an "uncontained gas" and clearly not a solid waste, and the asphalt was a product being used for its intended purpose and also not a solid waste. Accordingly, the mixture rule does not support the conclusion that the asphalt and soil is a hazardous waste, or should be managed as a hazardous waste.

The "derived-from" rule provides that "any solid waste generated from the treatment, storage, or disposal of a hazardous waste, including any sludge, spill residue, ash, emission control dust, or leachate (but not including precipitation runoff) is a hazardous waste." 40 C.F.R. § 261.3(c)(2)(i). A prerequisite of the derived-from rule is that a solid waste must exist for the rule to apply. The unconfined volatilization of hazardous constituents, however, does not create a solid waste that is generated or "derived" from the listed waste. Instead, only gas comes directly from the listed waste, and this gas is not a solid waste. Accordingly, application of the "derived from" rule also will not support the conclusion that the asphalt and soil is a hazardous waste, or should be managed as a hazardous waste.

Finally, application of the "contained-in policy" (40 C.F.R. § 261.3(f)(2)) will not support the conclusion that the asphalt and soil "contains" hazardous wastes. If the demolished asphalt and soil were a solid waste (which Respondent denies), they were debris. Environmental media and debris that are contaminated with listed hazardous waste must be managed as a hazardous waste only until they no longer contain the listed hazardous waste. *See* 60 Fed. Reg. 66344, 66347 (December 21, 1995). Importantly, the contained-in policy only applies while the media or debris contains the listed waste, and once the waste is removed, hazardous waste management requirements no longer apply. *Id.*; *see also*, 40 C.F.R. § 261.3(f)(2) (excluding debris from definition of hazardous waste if EPA determines, after considering the extent of the contamination, that the debris "is no longer contaminated with hazardous waste"). Media and debris that contain hazardous constituents below

Id.; *see also*, 40 C.F.R. § 261.3(f)(2) (excluding debris from definition of hazardous waste if EPA determines, after considering the extent of the contamination, that the debris "is no longer contaminated with hazardous waste"). Media and debris that contain hazardous constituents below *de minimis* amounts do not "contain" the listed hazardous waste. *Id.* The concentration of hazardous constituents in the asphalt and soil is sufficiently low that this material does not "contain" any hazardous waste originating from Pit A or the Disposal Shafts.

A detailed discussion of the facts and law that support a finding that the asphalt and soil is not a hazardous waste is included as Attachment A to this answer, and this exhibit is incorporated by reference herein.

FOURTH AFFIRMATIVE DEFENSE

All of the allegations alleged by NMED are predicated on a finding that the approximately 30-40 cubic yards of asphalt and soil that was transported from the swale adjacent to the mixed waste dome to the Area G Stockpile was then subsequently transported to the Land Bridge and Pit 37. Respondent's fourth affirmative defense is that only asphalt and soil from other portions of the Area G Stockpile were transported to the Land Bridge and Pit 37, and material in the Area G Stockpile that originated from the Area L swale may not have been sent to the Land Bridge or Pit 37.

FIFTH AFFIRMATIVE DEFENSE

With regard to the allegations contained in Paragraphs 46, 47, and 53, Respondent states that the scope of the NMED requirement to manage and dispose of asphalt removed from the site of the waste dome storage area construction as a hazardous waste was limited to asphalt and soil removed from Pad A, and did not include asphalt and soil from the adjacent swale. The language of the July 22, 1994 letter from Benito Garcia is specifically limited to "asphalt removed from the existing *pad*."

SIXTH AFFIRMATIVE DEFENSE

With regard to the allegations contained in Paragraphs 64 and 82, Respondent states that NMED has provided no evidence that the placement of approximately 60 cubic yards of asphalt and soil at the Los Alamos County Landfill from the Area G Stockpile presents any actual or potential threat to human health or the environment. Onsite sampling and a risk-based analysis conducted by Respondent has confirmed that placement of this waste does not present a significant risk to human health or the environment.

SEVENTH AFFIRMATIVE DEFENSE

Respondent affirmatively states that NMED lacks jurisdiction under the violations pled in the Order because the agency's authority for each alleged violation derives from the New Mexico Hazardous Waste Act, which only grants the agency authority with respect to the generation, management,

of hazardous waste, and as a result, NMED lacks jurisdiction to prosecute the alleged violations, assess the claimed civil penalties, and require the Schedule of Compliance.

EIGHTH AFFIRMATIVE DEFENSE

With regard to the civil penalties proposed by the Order, Respondent states that as to the alleged violations enumerated in the Order which Respondents have denied in this Answer, no civil penalty may be imposed.

NINTH AFFIRMATIVE DEFENSE

With regard to the civil penalties proposed by the Order, Respondent asserts the following defenses:

a. NMED failed to consider the good faith efforts of Respondents to comply with the alleged applicable requirements, pursuant to 74-4-10.B NMSA 1978;

b. NMED failed to consider the seriousness of the alleged violations, pursuant to 74-4-10.B NMSA 1978;

c. NMED failed to adhere to the Hazardous Waste Penalty Policy adopted by NMED on September 4, 1992;

d. NMED failed to consider that Respondent self-reported this situation and as a result should be provided a reduction or elimination of civil penalties;

e. NMED's imposition of penalties is arbitrary, capricious, unlawful, and without substantial basis in law or in fact; and

f. NMED improperly imposed penalties for alleged violations of law which did not occur.

The Compliance Order contains in Paragraph 85 a Schedule of Compliance and an ordered action requiring Respondent to (i) submit a plan of action to take appropriate measures to assure that the alleged hazardous wastes disposed of at the Los Alamos County Landfill will not migrate within 60 days of receipt of the Order; (ii) implement this plan of action, following NMED approval, within 120 days of receipt of the Order (including quarterly maintenance reports and biannual monitoring reports); and (iii) submit an application for a post-closure permit for the Los Alamos County Landfill within 180 days of receipt of the Order. Respondent objects to this requirement because it is vague, overly broad, and not justified based on the lack of real or threatened adverse impact on human health and the environment.

Notwithstanding any response on the part of Respondent to Paragraph 85, Respondent states (i) that in the event that it completes the ordered action, Respondent does not admit the underlying finding

or conclusion contained in any numbered Paragraphs of the Order that may be related to the ordered action, unless specifically admitted in this answer; (ii) that it reserves the right to contest and dispute any underlying finding or conclusion relating to the ordered action, unless the underlying finding or conclusion has been specifically admitted in this Answer; and (iii) that Respondent denies on both substantive and procedural grounds NMED's basis for requiring Respondent to complete the ordered action contained in Paragraph 85, and hereby place at issue all aspects of the ordered action unless Respondent has admitted both the underlying finding and underlying conclusion contained in the related numbered Paragraph in the Order.

FACTS PLACED AT ISSUE

Respondent places at issue all facts denied in this answer.

REQUEST FOR HEARING

Respondent requests a hearing to address the matters raised by Administrative Compliance Order 98-03 and this answer pursuant to Section 74-4-10 of the New Mexico Hazardous Waste Act, NMSA 1978 and 20 N.M.A.C. 1.5.200.

WHEREFORE, Respondent, The Regents of the University of California, requests that Complainant, the New Mexico Environment Department, rescind Administrative Compliance Order 98-03 in its entirety, or in the alternative, that the appropriate adjudicatory body determine that Respondents did not commit the violations alleged by the Complainant. In the event that a violation is determined to have occurred, which Respondent specifically denies, Respondent prays that any proposed civil penalty for any such violation be reduced, that the Schedule for Compliance in this Order be denied, and that any other such relief to which Respondent shows itself entitled be granted.

I hereby affirm my belief that the information contained herein is to the best of my knowledge true and correct.

The Regents of the University of California

By: _____

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ATTORNEYS FOR THE REGENTS OF THE UNIVERSITY OF CALIFORNIA

STATE OF NEW MEXICO
ENVIRONMENT DEPARTMENT

IN THE MATTER OF
THE UNITED STATES DEPARTMENT OF ENERGY
AND THE REGENTS OF THE UNIVERSITY OF CALIFORNIA
LOS ALAMOS, NEW MEXICO
NM0890010515

COMPLIANCE ORDER
HRM-98-03 (CO)

CERTIFICATE OF SERVICE

I certify that a copy of the foregoing Answer and attached exhibits was hand-delivered on the 27th day of July, 1998 to the following persons:

New Mexico Environment Department
ATTN: Nick Persampieri
General Counsel
1190 Runnels Building
Santa Fe, NM 87505

Hortense Haynes
Counsel's Office
Department of Energy
Los Alamos Area Office
528 35th Street
Los Alamos, NM 87544

Sheila E. Brown, Esq.

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Los Alamos
NATIONAL LABORATORY
memorandum
Office of the Director

To/MS: Laboratory Leadership
From/Ms: James F. Jackson, DDO
Phone/Fax: 7-5101/7-2997
Symbol: DD
Date: February 10, 1998

Subject: Legacy Waste Cleanup

In keeping with our goal of ES&H excellence, and our commitment to meet or exceed the requirements of all federal/state laws, I have accepted and approved a combined EM and ESH Division accelerated schedule for addressing the Laboratory legacy materials problem. This problem involves the presence of chemicals at various locations which do not have an identifiable owner, and may either be a usable product or may need to be characterized and disposed of as waste. In addition to posing regulatory compliance issues, abandoned chemicals potentially present health and safety concerns for our employees.

On November 17, 1997, Tom Todd and John Browne met with Secretary Mark Wiedler of the NMED to discuss environmental issues. As a result of that meeting, John made a commitment that the Laboratory would pursue an expedited approach in dealing with legacy materials. The plan we are pursuing meets that commitment.

The plan specifies an accelerated schedule to rid the Laboratory of legacy materials by the end of September. The main focus of this effort will be hazardous and mixed waste, not radioactive waste. (Mixed waste is RCRA hazardous waste combined with radioactive waste.) Most of the costs for characterization, analysis, and disposal, will be institutionally funded. However, it is important to note the successful completion of this plan requires all organizations using chemicals to play an integral role in its execution. Division-level managers are responsible for ensuring that their laboratories, operations, facilities and spaces are surveyed to identify all chemicals for which a current owner or a programmatic need cannot be established. Chemicals that have a useful life but for which no programmatic need exists may be offered to the Laboratory's CHEAPER program, which stores and makes available chemicals for use Laboratory-wide. Chemicals for which the Laboratory has no present or future need will be designated as waste using the approach described below.

A "Legacy Work-off Team" has been formed comprised of individuals from the Hazardous and Solid Waste group (ESH-19), Industrial Hygiene and Safety group (ESH-5), Health Physics Operations (ESH-1), and Environmental Management Solid Waste Operations (EM-SWO) group. Members of this team are available to provide assistance to the line organizations as needed during the survey and identification phase. The line organization is responsible for identifying the quantity, condition and location of all chemicals found and providing this information to the Legacy Work-off Team. The Legacy Work-off Team will be providing storage containers for the chemicals designated as waste at the site, as needed. Upon completion of the inventory, the Legacy Work-off Team will be responsible for characterization, analysis, transport and disposal of all materials designated as hazardous or mixed waste. **Low-Level radioactive waste that is identified as legacy material should be**

managed appropriately, and EM-SWO should be notified to work with the line organization to remove the waste in a timely manner. A Laboratory-wide schedule detailing the time, start and completion dates for each organization and their area of responsibility is included in the attached plan.

The prime responsibility of each Director is to organize and direct their staff and programs to best accomplish this task within the allotted time for each area. Directors, in addition to ensuring cooperation from all personnel within their organizations, will provide written assurance to my office that all legacy and orphan chemicals have been identified and properly disposed of or otherwise properly managed. After this project is completed, I expect the Directors to maintain the proper management of chemicals and waste materials for which they are responsible in the future.

Thank you for your cooperation in implementing this project.

JFJ:pr

Attachment: a/s

cc:

G. T. Todd, DOE-LAAO, A316
P. R. French, DIR, A122
P. Thullen, DIR, A100

2390

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EDGAR T. THORNTON, III
DEPUTY SECRETARY

January 29, 1998

John C. Browne, Director
University of California
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Dear Mr. Browne:

Re: Response to December 8, 1998 Letter

I am in receipt of your December 8, 1997 letter in which you bring three issues to my attention. I will briefly address these in the order in which they were presented.

First, with regards to the self assessment information requested by NMED's inspectors, it is my understanding that this information was offered to NMED when the self assessment project was initiated more than two years ago. NMED's inspectors were curious as to the effectiveness of the program when they made the request. Also, at the time of the request, it was made clear that unless the violating conditions noted in the self assessment documentation still existed or a reportable incident was documented yet not reported to NMED, this documentation could not be used for compliance purposes.

You also refer to a **draft** policy on self assessments which is being considered by NMED. NMED recognizes the importance of the regulated community performing self-audits and does not want to impede this type of activity. As I stated above and as it was made clear by NMED's inspectors, this information cannot be used unless the violating condition still exists with no action taken by the facility for remediation or if it was a reportable incident. Until the policy on self assessments is finalized, NMED inspectors are bound by the above guidelines under the regulations.

It concerns me that UC-LANL management believes that information concerning proper procedures in handling problems at the lab must be withheld, especially since this information cannot be used for enforcement actions. If upper management has to withhold this information to maintain internal credibility with Laboratory line

managers so they feel comfortable bringing problems to the attention of Laboratory senior management, then I must ask how senior management knows what is going on at the facility.

With regards to the inspection documents falsified at TA-54, Areas L and G, NMED disagrees with UC-LANL's legal counsel. NMED believes this is a reportable incident since it involves the largest hazardous waste and mixed waste storage facility in the State. NMED requests that all documentation including the report submitted to the DOE Office of the Inspector General be submitted to NMED/HRMB within ten (10) days from receipt of this letter.

The management actions and procedures followed concerning the disposal of hazardous waste contaminated asphalt from TA-54 is of deep concern to me. It appears from letters, memos and meeting notes that proper handling of this material was addressed in a letter from NMED to LANL on July 22, 1994. NMED will be addressing this issue in the near future.

Finally, you asked how the facility should interact with NMED. In short, up front and honestly, I have received DOE documents that present concerns about the first three issues mentioned above and the legal implications which were subsequently edited by management to delete the problematic parts of the document. The problems are real and when hidden often become a very serious situation for the regulated entity. Therefore, I suggest that you should insist upon complete honesty from your management team. If I can be of further assistance, please don't hesitate to call me.

Sincerely,

Mark Weidler
Secretary

cc: Thomas Todd, DOE-LAAO
Joe Vozella, DOE-LAAO
University of California Board of Regents
Ed Kelley, Ph.D, Director WWMD
Benito Garcia, Chief HRMB
John M. Tymkowych, RCRA I&E Program Manager
Robert S. "Stu" Dinwiddie, RCRA Permitting Program Manager

Attachment A

MEMORANDUM OF LAW

ASPHALT REMOVED FROM TECHNICAL AREA 54, AREA L IS NOT A HAZARDOUS WASTE

I. INTRODUCTION.

The New Mexico Environment Department ("NMED") has indicated that it believes that Los Alamos National Laboratory ("LANL") improperly managed demolished asphalt and soil removed from Technical Area 54, Area L. The fundamental NMED allegation is that the demolished asphalt and soil is a listed hazardous waste because the asphalt contains trace levels of solvent constituents as a result of contact with vapor/gases originating from underlying waste management units. A careful analysis of the facts and law demonstrate, however, that the demolished asphalt and soil removed from Area L is clearly not a hazardous waste, and is not subject to the management and disposal standards applicable to such wastes.[1]

I. BACKGROUND FACTS.

On June 14, 1994, LANL requested that the Hazardous and Radioactive Materials Bureau ("HRMB") of the NMED approve the upgrade of the Mixed Waste Storage Pad at Technical Area ("TA") 54 Area L by the replacement of the then-existing mixed waste container storage area with

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[1] The regulations defining "solid waste" and "hazardous waste" have been described as "the most complex environmental regulations ever written." Williams & Cannon, *Rethinking the Resource Conservation and Recovery Act for the 1990s*, 21 Env't Law Rept. 10063, 10064 (Feb. 1991). Further, the D.C. Circuit Court of Appeals described the process of applying these definitions as "mind-numbing." *American Mining Congress v. EPA*, 824 F.2d 1177, 1189 (D.C. Cir. 1987). Finally, EPA itself has stated that the definition of "solid waste" is "difficult to understand and implement for EPA, the states, and industry" and that "[p]ermitting and enforcement are hampered by the complexity of the [] definitions." Office of Solid Waste and Emergency Response, *RCRA, The Nation's Hazardous Waste Management Program at a Crossroads*, U.S. EPA No. 205-001 (July 1990) at 38.

a mixed waste storage dome (hereafter this old pad that was demolished as part of the construction of the mixed waste storage dome is referred to as "Pad A," and the new pad constructed as part of the mixed waste storage dome is referred to as "Pad AA"). The new storage dome was intended to entirely overlap the Pad A footprint, and also to extend the Pad A footprint to the north and west. In 1994 prior to demolition of Pad A, LANL collected a limited number of samples of the Pad A asphalt. Analytical results from these samples indicated that the asphalt from Area L detected trace amounts of 1,1,1-trichloroethane, trichloroethylene, and tetrachloroethene. NMED approved LANL's request to build a new storage dome by letter dated July 22, 1994, conditioned upon the following: "[b]ecause the asphalt pad has been contaminated with Volatile Organic Compounds (VOCs) from the underlying SWMU, all waste asphalt removed from the existing pad must be treated and/or disposed of as a hazardous waste." *See* Letter from Benito J. Garcia (Chief HRMB) to Joseph C. Vozella, dated July 22, 1994.

The source of the VOCs in the asphalt is a plume of volatilized solvents (or "pore gas") that exists beneath the waste storage pad. Moreover, this pore gas apparently originated from either one or both of two closed Solid Waste Management Units ("SWMU") that are located near or beneath Pad A, specifically: (1) Pit A and (2) the Waste Disposal Shafts. Several of the waste disposal shafts contain listed hazardous wastes, including F002 (spent halogenated solvent wastes).

As part of the construction of the new storage dome, it was necessary to fill low areas on the north and west sides of Pad A to bring the expanded area of the new waste storage area to a consistent, even elevation. In a meeting between LANL and NMED in June of 1994, NMED authorized reuse of the asphalt from Pad A as fill material in the immediate area of the storage dome construction site at Area L. The NMED and LANL agreed that such movement and use would not

constitute "placement" of the asphalt, and no act of waste generation would occur (*i.e.* the regrading activities would not convert the asphalt from Pad A into a solid waste). It was clear to those who attended the meeting that use of the Pad A asphalt as fill for construction of the new storage dome was acceptable to NMED. LANL did not regard the subsequent letter from Benito Garcia dated July 22, 1994 (referenced above) as inconsistent with this agreement regarding use of the asphalt as fill. Moreover, because the reuse of the demolished asphalt as fill satisfied LANL's management objectives, LANL saw no need to take issue formally with NMED over the regulatory status of the demolished asphalt.

Beginning in May through the middle of June of 1995, Pad A was broken up, crushed, used to fill low-lying areas on the north and west sides of Pad A, and compacted in place. The primary access point for these construction activities was the south side of Pad A across an asphalt-covered shallow swale. This swale was not part of Pad A, but rather was isolated from the pad by a curb. The heavy vehicle traffic across the asphalt swale caused substantial damage to this surface, and LANL determined that this surface also should be replaced in conjunction with pouring the pad for the new waste storage dome. These construction activities included breaking up the asphalt from within the swale area, crushing the asphalt, using it to fill areas on the north and west sides of Pad A, and compaction in place.

Nevertheless, not all of the swale asphalt could be reused as fill, and on June 15, 1995, LANL transported approximately 30-40 cubic yards of excess asphalt from the swale south of the dome in Area L to the site where the Area G compactor building has since been constructed. The excess asphalt sent to Area G was not managed as a hazardous waste.

II. ADSORPTION OF TRACE LEVELS OF SOLVENT CONSTITUENTS FROM PORE GAS WILL NOT RENDER THE ASPHALT HAZARDOUS.

NMED has alleged that the asphalt transferred to Area G should have been managed as a hazardous waste because of the trace VOC constituents that presumably were adsorbed into the asphalt from pore gas emanating from Pit A and/or the Disposal Shafts. Nevertheless, the asphalt is neither a characteristic hazardous waste pursuant to 40 C.F.R. §§ 261.20, nor a hazardous waste specifically listed in 40 C.F.R. § 261.30. NMED's argument is apparently based on the view that the asphalt is a listed hazardous waste because the listing that applies to the wastes disposed of in the SWMUs (*e.g.* F002) "carries through" via the pore gas, and attaches to the asphalt when the pore gas adsorbs onto this media. NMED has also apparently received some support for this view from hazardous waste personnel within the U.S. Environmental Protection Agency ("EPA") Regional Office. Although not clearly articulated by NMED and EPA, it appears that such a view utilizes or relies on one or more of the following to reach this conclusion: (1) the "mixture rule," (2) the "derived-from rule," or (3) the "contained-in" policy.[2] As discussed in greater detail below, however, these regulatory concepts do not support designation of the excess asphalt as a listed hazardous waste.

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[2] EPA has acknowledged that even the properly interpreted "mixture" and "derived-from" rules are over-inclusive beyond what is necessary to adequately protect the environment, and has sought mechanisms to provide a more reasonable and cost-effective regulatory structure. *See e.g.* 60 Fed. Reg. 66344, 66346 (December 21, 1995)("EPA acknowledges that the mixture and derived-from rules apply regardless of the concentrations and mobilities of hazardous constituents in the waste. The purpose of this [proposed] rulemaking is to reduce any overregulation of low-risk wastes captured by the mixture and derived-from rule[s]"); 57 Fed. Reg. 21450, 21473 (May 20, 1992)(noting that the unintended consequences of the mixture and derived-from rules can lead to regulation of materials with little or no environmental importance as hazardous wastes).

A. The Mixture Rule Does Not Apply Because Neither The Pore Gas Nor The Asphalt Was A Solid Waste At The Time The Mixture Was Created.

Under the mixture rule, a solid waste is a hazardous waste if it is mixed with one or more listed hazardous wastes. 40 CFR § 261.3(a)(2)(iv). In order for the mixture rule to apply, two or more *solid wastes* must be mixed or somehow combined together, and at least one of these solid wastes also must be a listed hazardous waste. *Id.*; *see also*, *Shell Oil Co. v. EPA*, 950 F.2d 741, 749 (D.C. Cir. 1991); *United States v. Johnson*, 886 F.Supp. 1057, 1067 (W.D.N.Y. 1995) (holding that the mixture rule does not apply to a mixture of a solid waste and water because "it does not appear that ordinary water is a 'solid waste' under the definitions in the RCRA regulations"). In the instant case, neither the pore gas nor the asphalt pad were a solid waste at the time that these two materials were combined. Accordingly, the mixture rule cannot apply.

The Solid Waste Disposal Act ("SWDA") defines a solid waste as:

> [A]ny garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or *contained gaseous material* resulting from industrial, commercial, mining, and agricultural operations . . . .

42 U.S.C. § 6903(27) (emphasis added). Thus, for gaseous material to be a solid waste the material must be contained. EPA has consistently taken the position that this means contained within a discrete canister or other type of container.[3] Uncontained gases whether conveyed in process duct

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[3] The federal courts have in other contexts emphasized that the definition of "solid waste" should be interpreted with care so as not to exceed the scope of the statutory language:

> First, the definition of "solid waste" is situated in a section containing thirty-nine separate defined terms. This is definitional specificity of the first order. The very care evidenced by Congress in defining RCRA's scope certainly suggests that Congress was concerned about delineating and thus cabining EPA's jurisdictional reach.
>
> . . . .
>
> Second, the statutory definition of "solid waste" is quite specific. Although Congress

work, piping, or totally open to the environment (like the pore gas) are not sufficiently "contained" to meet the requirements of the solid waste definition. *See e.g.*, 47 Fed. Reg. 27520, 27530 (Jun. 24, 1982) (EPA explaining that process waste gas contained within vent piping of duct work routed to an air abatement device is not a solid waste because the process waste gas is not "contained"); Memorandum from John H. Skinner to James H. Scarbrough, dated July 31, 1984 ("gaseous emissions are not solid wastes") (attached as Exhibit A); Letter from Matthew Straus to Gregory J. Harvey, July 15, 1986 ("the solvent vapor is not a solid waste (see Section 1004(27) of the Solid Waste Disposal Act, as amended, where the term "solid waste" is defined to include, among other things, *contained* gaseous material). Since these solvent vapors are not contained, they are not defined as solid or hazardous wastes.") (attached as Exhibit B); Memorandum from Matthew Straus to Clifford Ng, June 17, 1987 ("Stream A, the methanol-laden air from the drying and granulation step of the process, does not meet the definition of solid waste under RCRA because it is in vapor form and not confined in a container") (attached as Exhibit C). Accordingly, the pore gas is clearly not a solid waste.

Similarly, the asphalt was also not a solid waste at the time that it adsorbed trace levels of solvent constituents, but instead was being used as paving over the swale adjacent to Pad A. At this point, the asphalt was not a *discarded material* by virtue of being abandoned, recycled, or inherently waste-like. 40 C.F.R. § 261.2; *see also* Letter from Marcia Williams to Gary Dietrich dated February 9, 1987, at p. 5 (pallets contaminated with a listed hazardous waste while being used for their

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> well knows how to use broad terms and broad definitions . . . . the definition here is carefully crafted with specificity.

American Mining Congress v. EPA, 824 F.2d 1177, 1189-90 (D.C. Cir. 1987).

intended function are not a solid waste and the mixture rule does not apply, even at the time that the pallets are eventually discarded)(attached as Exhibit D). Thus, the asphalt also was not a solid waste. For NMED to prove that the mixture rule applies, it must show that two solid wastes were combined, and that at least one of these solid wastes was also a hazardous waste. *See United States v. Johnson*, 886 F.Supp. 1057, 1067 (W.D.N.Y. 1995). In this case, neither one of these materials can be shown to have been a solid waste at the time that the mixture was created, much less that both were. As a result, the mixture rule does not apply to the excess asphalt transferred to Area G.

B. The Derived-From Rule Does Not Apply Because The Demolished Asphalt Is Not Derived From the Treatment, Storage, or Disposal Of A Listed Waste.

The "derived-from" rule provides that "any solid waste generated from the treatment, storage, or disposal of a hazardous waste, including any sludge, spill residue, ash, emission control dust, or leachate (but not including precipitation runoff) is a hazardous waste." 40 C.F.R. § 261.3(c)(2)(i). Much like the mixture rule, a prerequisite of the derived-from rule is that a solid waste must exist for the rule to apply. Indeed, the regulatory language makes this clear. "Emission control dusts" are included as possible "derived-from" wastes, but uncontained gaseous vapor emissions are not. Similarly, the potential "derived-from" wastes include "leachate," which is a solid waste, but specifically do not include precipitation runoff, which is an environmental media and not a solid waste.

An elementary concept of statutory and regulatory construction is that the inclusion of enumerated provisions implies the exclusion of unenumerated provisions—particularly if the unenumerated terms are of a different type or character. *See United States v. McQuilkin*, 78 F.3d 105, 108 (3d Cir. 1996)("The doctrine of *inclusio unius est exclusio alterius* informs a court to

exclude from operation those items not included in a list of elements that are given effect expressly by the statutory language"). The language of the derived-from rule lists solid wastes that originate *directly* from the storage, treatment, or disposal of the listed hazardous waste. The language excludes materials that are not solid wastes, either explicitly (*e.g.* precipitation runoff is excluded even if this runoff *contains* hazardous waste constituents) or implicitly (*e.g.* the volatilized solvents within the pore gas are not included because they are not a solid waste). Thus, the derived-from rule does not apply to the pore gas because, as noted above, this uncontained gas is not a solid waste. Moreover, principled application of the rule does not permit one to skip over the pore gas and somehow link the disposal of the listed waste directly to the demolished asphalt. This is because (1) the demolished asphalt is not directly derived from the disposal or treatment of the listed wastes in Pit A or the Waste Disposal Shafts—but rather from the demolition of the swale asphalt; and (2) the non-solid waste character of the pore gas severs the required link between the disposal of the listed waste and the creation of the demolished asphalt.

Examples of normal applications of the derived-from rule illustrate these distinctions. The derived-from rule most frequently applies to wastes generated as part of the *treatment* of a hazardous waste. Examples include sludges from wastewater treatment, ash from hazardous waste incineration, and bottoms from waste solvent distillation. In each case, the "derived-from" solid waste is derived directly from the treatment of the original listed waste. In contrast, the demolished asphalt is not derived directly from the listed wastes in either the evaporation pit or the disposal shafts, and is unrelated to any active management of these waste management units.

Similarly, the most frequent situation where the derived-from rule applies to *disposal* of listed waste is the generation of leachate from a land disposal waste management unit. *See* 53 Fed. Reg.

31147 (August 17, 1988). Again the distinction is that the leachate, unlike the pore gas, is a solid waste that is derived directly from the listed waste. Furthermore, the volatilization of the solvent constituents—unlike creation of leachate—is not disposal of a solid waste. As a result, any *disposal* of the pore gas is outside the scope of derived-from rule.

Finally, application of the derived-from rule under circumstances similar to the Area L asphalt situation leads to absurd results. The basic premise is as follows:

(i) small amounts of hazardous constituents volatilize from a listed hazardous waste and create an ambient air mixture that contains small amounts of hazardous constituents;
(ii) this contaminated air contacts material or media, which at the time of contact is not a solid waste;
(iii) the material later becomes a solid waste (such as debris) for reasons unrelated to the contact with the contaminated air (note that LANL denies that the demolished asphalt is a solid waste);
(iv) trace amounts of hazardous constituents are detectable within the material;
(v) when the material becomes a solid waste it is also a listed hazardous waste under the derived-from rule.

Under this same analysis, asphalt adjacent to or near the vent on a spent solvent storage tank controlled with a carbon adsorption system that is 95 percent efficient (in compliance with 40 C.F.R. 264.1032) would be a listed hazardous waste (once it becomes a solid waste) if measurable concentrations of solvent constituents are present. Similarly, trees cleared from an area downwind of a wastewater treatment tank managing listed hazardous waste would also presumably need to be managed as a listed hazardous waste if they contain organic constituents present in the listed wastes—perhaps even if the organic constituents naturally occurred in the trees at some concentration. This cannot be the rule.

Indeed, EPA has recognized that illogical and over-broad application of the derived-from rule can result in egregious over-regulation of wastes that pose little or no threat to human health or the

environment. *See* footnote 2 *supra*. Moreover, the Agency has sought, at least in a limited way, to avoid the unjustified economic consequences of over-application of the derived-from rule. For example, in the refinery context, EPA has applied the derived-from rule to API Separator Sludge (K051) in a way that avoided turning the entire refinery into a hazardous waste management unit. *See* Memorandum from John H. Skinner to the Directors, Waste Management Division for Regions I-X (attached as Exhibit E). The EPA Director of the Office of Solid Waste explained:

> A literal reading of 40 C.F.R. 261.3(c)(2)(i), the "derived from" rule, would suggest that the resultant liquid stream [the wastewater effluent of the API separator] is a hazardous waste and remains one until delisted. Since refiners generally return the aqueous stream to the refinery wastewater system, the mixture rule . . . would define the combined water stream and all subsequent residuals as hazardous wastes . . . .
>
> After careful consideration of the characteristics of the currently listed refinery wastes, the waste management practices, and the disposition of the recycle streams, we have concluded that the "derived from" rule is not uniformly applicable to the aqueous stream generated in the sludge dewatering process. Our interpretation is based on the presumption that properly conducted dewatering of a wastewater treatment residual will insure that none of the listed waste is returned to the system, while simultaneously reducing the total amount of waste generated. It is our opinion that dewatering of the currently listed refinery wastes can be conducted in a manner that insures the return of only the non-listed wastewater which came into contact with, but was not mixed with, the listed waste.

Id. Plainly, EPA's decision with regard to API separator sludges was based on an attempt to find a reasonable way to apply the derived-from rule to an ambiguous factual situation. As demonstrated above, the argument that the derived-from rule applies to the pore gas is even more attenuated than its potential application to wastewater effluent from an API separator.

In summary, application of the derived-from rule to the unconfined volatilization of hazardous constituents should be rejected because a solid waste is not generated or "derived" from the listed waste. Instead, only pore gas comes directly from the listed waste, and this gas is not a solid waste.

Moreover, EPA has indicated that the derived-from rule should be implemented keeping in mind the practicality and reasonableness of its regulatory decision. One cannot justify management of the demolished asphalt and soil as a hazardous waste given that it poses essentially no meaningful threat to human health or the environment.

C. THE ASPHALT DOES NOT "CONTAIN" HAZARDOUS WASTE UNDER THE CONTAINED-IN POLICY.

The "contained-in policy" is an extension of the "mixture" and "derived-from" rules. 57 Fed. Reg. 983 (January 9, 1992) ("EPA is codifying the "contained-in" principle, which has heretofore served as an interpretive gloss on the existing mixture and derived-from rules"). The contained-in policy simply extends these two concepts to mixtures of listed hazardous waste and environmental media, such as contaminated soil and groundwater and nonmedia debris. *See* 40 CFR § 261.3(f)(2); 58 Fed. Reg. 48092, 48123-124 (Sept. 14, 1993). Nevertheless, the contained-in policy is separate and distinct from the derived-from and mixture rules. *See* 60 Fed. Reg. 66344, 66347 (December 21, 1995). Environmental media and debris that are contaminated with listed hazardous waste must be managed as a hazardous waste only until they no longer contain the listed hazardous waste. *Id.* Importantly, the contained-in policy only applies while the media or debris contains the listed waste, and once the waste is removed, hazardous waste management requirements no longer apply. *Id.*; *see also*, 40 C.F.R. § 261.3(f)(2) (excluding debris from definition of hazardous waste if EPA determines, after considering the extent of the contamination, that the debris "is no longer contaminated with hazardous waste"). Media and debris that contain hazardous constituents below *de minimis* amounts

do not "contain" the listed hazardous waste. *Id.*[4] This *de minimis* threshold is an important distinction between the "contained-in" policy and the mixture and derived-from rules.

"Debris" includes discarded man-made materials such as (1) glass; (2) concrete; (3) masonry and refractory bricks; (4) non-intact containers (*e.g.* crushed drums); (5) tanks; (6) pipes, valves, appliances, and industrial equipment; (7) scrap metal; (8) animal carcasses; (9) tree stumps and wood; (10) rock; and (11) paper, plastic, and rubber. 57 Fed. Reg. 37194, 37222 (Aug. 18, 1992). The minimum particle size for "debris" is 2.5 inches. Nevertheless, EPA recognizes that debris will often include modest amounts of soil and other smaller particle size material. The definition of "debris" simply requires that the material be "comprised primarily of debris, by volume, based on visual inspection." 40 C.F.R. § 268.2(g). Thus, if the demolished asphalt and soil originating from the demolition of the swale area and subsequently moved to Area G is a solid waste (which LANL denies), then it is debris. Nevertheless, this material (even if it is debris) does not contain a hazardous waste. As noted at length above, the pore gas is not a solid waste, and as a result the adsorption of trace quantities of solvent constituents from this gas into the asphalt is not equivalent to the

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[4] In a relatively recent letter, EPA explained this concept as follows:

> [E]nvironmental media that contain listed hazardous wastes must be managed as hazardous wastes because -- and only as long as -- they contain listed waste(s). EPA Regions and authorized states may apply the contained-in policy to determine site-, media-, and contaminant specific levels, such that if the concentration of the hazardous constituents in the environmental media fall below these levels, the environmental media may be determined to no longer contain hazardous waste. Such "contained-in determinations may be made before or after treatment of the contaminated environmental media and may include consideration of site-specific exposure pathways (e.g. potential for human exposure, soil permeability, depth to groundwater).

Letter from Michael Shapiro to Peter Wright dated September 15, 1995 (attached as Exhibit F).

adsorption of a listed waste. Specifically, there is no support under HSWA or the EPA implementing regulations for the proposition that an unconfined gas present in the ambient environment becomes a "solid waste" once it condenses or adsorbs onto some other material present in the environment.

Furthermore, even if the contained-in policy potentially applies to the swale asphalt based on adsorption of solvent constituents from the pore gas, the solvent constituents in the swale asphalt are not present in sufficient concentrations such that this asphalt "contains" the listed waste. As noted above, unlike the mixture and derived-from rules, the contained-in policy clearly includes a *de minimis* threshold. Wastes containing hazardous constituents below this threshold cannot be hazardous wastes under the contained-in policy. As a result, even if NMED disagrees with LANL's conclusion that the contained-in policy does not apply, the extremely low concentrations of hazardous VOC constituents in the swale asphalt lead to the conclusion that this solid waste does not "contain" any hazardous waste.

On August 18, 1992, EPA promulgated the Hazardous Debris rule, which sets treatment standards for debris contaminated with listed hazardous waste. This rule explains that the contained-in rule sets forth a corollary principle that "debris which no longer contains listed hazardous waste would no longer be subject to Subtitle C regulation, provided that it does not exhibit any hazardous waste characteristic." 57 Fed. Reg. 37194, 37225-26 (August 18, 1992)(codified at 40 C.F.R. § 261.3(f)(2)). EPA explained further that the determination whether the debris "contained" the hazardous waste involves "a case-by-case determination by EPA . . . that [the waste] does not contain hazardous waste at *significant levels*, taking into consideration such factors as *site hydrogeology* and *potential exposure pathways, but excluding management practices*." *Id.* (emphasis

added); *see also,* Footnote 5 *supra* (contained-in de minimis determinations may include consideration of potential for human exposure, soil permeability, depth to groundwater).[5]

A risk screening analysis of the trace solvent constituents adsorbed into the swale asphalt demonstrates that this waste does not "contain" F002 wastes, or any other kind of listed hazardous waste. Approximately 66 asphalt samples and 22 soil samples were collected in areas where the swale asphalt may have been disposed after being removed from Area L (specifically at the Area G Stockpile and the Pit 37 Pile)[6]. Results from these samples, as well as the results from the three asphalt samples taken from Pad A in 1994, were then analyzed using a risk assessment screen to determine whether the trace solvent constituents adsorbed on the asphalt present a significant risk to human health or the environment. The unequivocal conclusion of this analysis is that these trace solvent constituents do not represent a significant environmental or health risk, and as a result, the asphalt does not "contain" the F002 waste.

The risk assessment screening method that was used to support this conclusion is based on the soil screening methodology developed by EPA Region 9, and adopted by Region 6 for use primarily at National Priorities List sites. The basic screening methodology and technical background

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[5] In a proposed rule addressing contained-in determinations for contaminated environmental media, EPA explained that relevant waste characteristics include: solubility, mobility, toxicity, and interactive effects of constituents present in the contaminated debris, and relevant site characteristics include: possible exposure pathways, topography, hydraulic conductivity, permeability, and other geologic and hydrogeologic characteristics that may influence constituent mobility and migration. 58 Fed. Reg. 48092, 48155.

[6] The Area G Stockpile includes several overlapping conical piles of asphalt and soil debris located east of the Area G compactor building. This pile may contain some material from the Area L asphalt swale. The Pit 37 Pile is a closed debris disposal area containing a mixture of asphalt and soil overlaid with approximately two feet of crushed tuff. A portion of the disposal cell may contain asphalt from the Area L swale.

for development of the soil screening levels is presented in three documents: "Soil Screening Guidance: User's Guide" (EPA/540/R-96/018); "Soil Fact Guidance, Fact Sheet" (EPA/540/F-95/041); and "Soil Screening Guidance Technical Background Document" (EPA/540/R-95/128). The soil screening guidance provides a relatively simple methodology to calculate risk-based, site specific, soil screening levels ("SSLs") for contaminants in soil. An SSL is defined as the concentration of a specific chemical, located within a specific media that would result in a total body burden equating an acceptable risk to human health (1 E-06) for a given exposure scenario. The intent of the SSLs is to provide an efficient way to identify areas needing further investigation as potential sites for environmental remediation. The SSL is essentially a threshold for additional review. Site constituent concentrations that exceed the constituent-specific SSL trigger additional review to determine what if any remediation is required. Concentrations below the SSL indicate that the constituent does not present a significant risk to human health or the environment, and the remediation investigation ends.

This risk screening process has been used at LANL with the approval of EPA Region 6. As part of this process, LANL has previously calculated "Screening Action Levels" ("SALs") that represent a conservative estimate of an acceptable (1 E-06) risk based on the site specific conditions at Los Alamos. Importantly, the SALs assume a conservative residential exposure scenario. As required by the contained-in determination described by 40 C.F.R. § 261.3(f)(2), the SAL analysis determines whether the asphalt contains the hazardous constituent at a *significant level*, via a process based on such factors as site hydrogeology, potential exposure pathways, and toxicity and mobility of the constituent -- but excluding management practices. *See,* 57 Fed. Reg. 37194, 37225-26 (August 18, 1992); *see also*, Letter from Michael Shapiro to Peter Wright dated September 15, 1995

(EPA may utilize "site-, media-, and contaminant-specific levels, such that if the concentration of the hazardous constituents in the environmental media fall below these levels, the environmental media may be determined to no longer contain hazardous waste;" this is exactly what the SALs accomplish) (attached as Exhibit F).

Comparison of the SALs to the results from the sampling at Pit 37 and the Area G Stockpile demonstrates that all sampling results for the chlorinated solvent constituents are well below the applicable SAL (or 1 E-06 risk level).[7] A copy of LANL's report: *Area G Asphalt Sampling and Analysis Project Results* (previously submitted to NMED in approximately March 1998), which summarizes these results, is included as Exhibit G.[8] All of the samples collected from the Pad A asphalt prior to its demolition are also below these conservative risk-based thresholds. Accordingly, even if one contends that the asphalt can "contain" a listed hazardous waste based on the unconfined, vapor-phase transport of trace constituents from the listed waste (a contention that LANL believes

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[7] This sampling project also measured the concentration of several metals and polycyclic aromatic hydrocarbons ("PAHs") in the asphalt. There was one sample that showed a lead concentration that exceeded the applicable SAL, and one sample that showed a flouranthene (one of the PAHs) concentration that exceeded the applicable SAL. These concentrations are consistent with asphalt that has been used as a surface for vehicle traffic (lead results from vehicle emissions and used oil, and flouranthene is a common minor constituent in asphalt). These lead and PAH results are not relevant to the hazardous waste determination described in this letter because neither lead nor flouranthene is a constituent in the vadose zone pore gas, which originates from the closed SWMUs.

[8] Note that this table only includes results for samples where a quantifiable concentration of the halogenated organic constituent was detected. Approximately 192 samples were submitted for analysis as part of this project, and approximately 68 of these exhibited no contamination at all and are not reported on the attached table. Moreover, in addition to volatiles analysis, samples were also analyzed for RCRA semi-volatiles and RCRA metals. These sample results are also excluded from the attached table. A complete summary of all samples with quantifiable concentrations of any of these compounds is available in Attachment 2 to *Area G Asphalt Sampling and Analysis Project Results* (attached as Exhibit G).

is incorrect), the concentration of hazardous constituents in the asphalt moved from Area L is substantially below the level necessary to support such a "contained-in" determination.

III. EPA HAS CHOSEN NOT TO REGULATE AIR EMISSIONS FROM LANDFILLS AND IMPOUNDMENTS THAT DID NOT RECEIVE HAZARDOUS WASTE AFTER THE EFFECTIVE DATE.

The one limited circumstance where EPA has regulated solid wastes contaminated with air emissions from hazardous waste management units has been its rules setting minimum control and abatement requirements for hazardous waste management units.[9] *See* 40 C.F.R. part 264, subpart AA (Air Emission Standards for Process Vents); subpart BB (Air Emission Standards for Equipment Leaks); subpart CC (Air Emission Standards for Tanks, Surface Impoundments, and Containers). By these rules, EPA also regulates the management and disposal of wastes generated by such air emission control operations. *See e.g.* 40 C.F.R. § 264.1033(m) (specifying disposal requirements for spent carbon used to control emissions from process vents). Nevertheless, the Agency chose not to regulate emissions from hazardous waste landfills or from impoundments that do not receive hazardous waste after the effective date of the applicable regulations. Indeed, the applicability of the subpart CC regulations cited above is limited to tanks, containers, and surface impoundments (receiving waste after the effective date). *See* 40 C.F.R. §§ 264.1080(a) & 265.1080(a). Because the underlying waste management units that are the source of the pore gas (Pit A and the Disposal Shafts) are not subject to control under existing regulations, the pore gas and the demolished asphalt and soil also are not subject to control as a result of these emissions.

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[9] The statutory authority in HSWA reads as follows: "the Administrator shall promulgate such regulation for the monitoring and control of air emissions at hazardous waste treatment, storage, and disposal facilities, including but not limited to open tanks, surface impoundments, and landfills, as may be necessary to protect human health and the environment." 42 U.S.C. § 6924(n).

IV. THE NMED DIRECTIVE REGARDING DISPOSAL OF THE OLD PAD ASPHALT DOES NOT APPLY TO MATERIAL REMOVED FROM THE ADJACENT SWALE.

Finally, the NMED letter directing that LANL treat the removed asphalt as a hazardous waste is limited to "all waste asphalt removed from the existing pad." The best evidence—the recollection of the construction workers in the area and other personnel associated with this project—suggests that the excess asphalt taken to Area G did not include any asphalt from Pad A, but rather was limited to asphalt from the adjacent swale. This asphalt is not part of the "pad" referred to in the NMED letter, and as a result, this letter did not prohibit the removal and subsequent disposal of the swale asphalt.

CONCLUSION

NMED has alleged that the asphalt transferred to Area G should have been managed as a hazardous waste because of the trace VOC constituents that presumably adsorbed into the asphalt from pore gas emanating from Pit A and/or the Disposal Shafts. Nevertheless, the asphalt is neither a characteristic hazardous waste pursuant to 40 C.F.R. §§ 261.20, nor a hazardous waste specifically listed in 40 C.F.R. § 261.30. Moreover, neither the "mixture rule," nor the "derived-from rule," nor "contained-in policy" supports designation of the excess asphalt as a listed hazardous waste.

VEHOU02:109154.1

EXHIBIT A

9441.1^34(15)

7-31-84

MEMORANDUM

SUBJECT: Ignitability Characteristic Application to Hot Gaseous Process Emissions

FROM: John H. Skinner, Director
Office of Solid Waste

TO: James H. Scarbrough, Chief
Residuals Management Branch, Region IV

In your June 27, 1984, memorandum you requested our guidance as to whether the hazardous determination of a waste is or is not supposed to be made at standard temperature and pressure or whether this determination is to be made in the form (i.e., gas, solid, liquid) that it is generated

In particular, you raised concerns about the destruction of materials in fume incinerators and argued that facilities could avoid regulation by simply not condensing vent gas and overhead emissions. You also argued the §261.21(a)(2) states that wastes which are not liquids must be evaluated for the ignitability characteristic at standard temperature and pressure.

At the facility in question, the generator had been condensing the gaseous emissions and feeding them along with other gaseous wastes into an incinerator. These gaseous emissions were previously condensed prior to treatment in a fume incinerator. This same facility now plans to feed uncondensed reactor vent gases directly to the fume incinerator (i.e., will not be condensing the gases and will only be sending gaseous emissions to the incinerator).

As you may be aware, our office previously addressed this issue when we finalized the incinerator regulation in June of 1982. In the preamble to that rule, we said that the feed to fume incinerators are subject to regulation only under the Clean Air Act and not under RCRA since these gaseous emissions are not solid wastes (see 47 FR 27530, June 24, 1982). In particular, we stated:

> "EPA agrees with commenters that fume incinerators are subject only to regulation under the Clean Air Act and does not intend that the Parts 264 and 265 regulations apply to these facilities. Fume incinerators which are used to destroy gaseous emissions from various industrial processes, for example, are not subject to regulation under RCRA. In general, the RCRA standards do not apply to fume incineration since the input is not identifiable as a solid waste, according to the definition set forth in §261.2".

However, we recently indicated in the Fecderal Register (49 FR 5314, February 10, 1984) that we are re-considering this position. In particular, in a proposal to list light end vent gases from the production of chlorinated aliphatic hydrocarbons, we stated that gaseous emissions which are condensable to liquids at standard temperature and pressure can be subject to regulation and would not be included in the exclusion of gaseous materials under RCRA (see Section 1004(28)). See preamble to proposal where we stated:

> ".... The light ends component of these overheads is in fact liquids at standard temperature and pressure, but because of elevated temperature and and admixture with gases (e.g., hydrogen, methane) they require some form of physical condensation to be isolated as liquids.....
>
> The Agency considers these light ends to be solid wastes within the meaning of Section 1004(2) of RCRA. Although these wastes are generated as gases, they are liquids at standard temperature and pressure, and can feasibly be condensed to the liquid phase after generation.
>
> The exclusion from RCRA of 'gaseous materials' that are not contained (Section 1004(28)), in the Agency's view, applies only to true gases, namely those which are not capable of being condensed and which remain gases at standard temperature and pressure.

Therefore, until we decide whether and how to finalize the proposal, we must defer a final answer to your question. In the interim, however, any incinerator that just receives gaseous emissions would be excluded from control under RCRA, as stated in the preamble to the final incinerator rules. At the same time, you should be aware that the rules may change and that incinerators that receive gaseous emissions, which are liquids at standard temperature and pressure, may be subject to regulation in the future.

If you have any further questions, please call Matt Straus of my staff at 475-8551.

EXHIBIT B

JUL 15 1986

Mr. Gregory J. Harvey
Industrial Hygenist
Occupational Medical Services
Newark Air Force Station, OH 43057-5000

Dear Mr. Harvey:

This letter is written in response to your request that EPA determine whether certain activated carbon canisters that are saturated with spent solvents should be managed as hazardous wastes under RCRA. More specifically, these canisters are used to collect vapors of the solvents Freon 113, 1,1,1-trichloroethane, and methylene chloride that are generated during their use as degreasing agents in paint spray booths.

As you are aware, the Agency has listed these compounds as hazardous wastes when they are used as solvents and have become contaminated with physical or chemical impurities and are no longer fit for use without being regenerated, reclaimed, or otherwise re-processed. Use as a solvent is defined as being used for their solvent properties, that is, to solubilize (dissolve) or mobilize other constituents; this includes use as a degreasing agent. (See 51 FR 6538, February 25, 1986.)

However, solvent vapor is not a solid waste (see Section 1004(27) of the Solid Waste Disposal Act, as amended, where the term "solid waste" is defined to include, among other things, contained gaseous material). Since these solvent vapors are not contained, they are not defined as a solid or hazardous waste. Furthermore, when the solvent vapor is adsorbed onto activated carbon, it would not be covered by the listing or by the mixture rule. Rather, these wastes would only be hazardous if they exhibit any of the hazardous waste characteristics. At this time, we do not know whether these cannisters would be defined as hazardous. However, you should be aware that on June 13, 1986, the Agency proposed a new extraction procedure (TCLP) to be used in the toxicity characteristic and also proposed to expand the toxicity characteristic to include, among other constituents, 1,1,1-trichloroethane and methylene chloride. (See enclosure.) Should this rule become final in its present form, your

CONCURRENCES

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chloride. (See enclosure.) Should this rule become final in its current form, your spent activated carbon may exhibit the characteristic of toxicity, if the canisters are not already hazardous for some other reason.

In summary, the subject waste is not currently a listed hazardous waste under RCRA and would only be hazardous if it exhibits any of the characteristics of hazardous waste; however, this waste may soon be subject to the regulation as hazardous, if it is not already hazardous, due to the toxicity characteristic. Since you recognize that these canisters may pose a substantial present or potential threat to human health or the environment, I urge you to manage them appropriately.

Sincerely,

Matthew Straus, Chief
Waste Characterization Branch

Enclosure

WH-562B:MStraus:bm:7/14/86

EXHIBIT C

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

JAN 17 1987

MEMORANDUM

SUBJECT: Methanol Recovery System; Clarification of Waste Status

FROM: Matthew A. Straus
Chief, Waste Characterization Branch

TO: Clifford Ng, Engineer, Region II, AWM-RWF

This is in response to your memo of February 18, 1987, in which you request our interpretation of the waste streams associated with a specific methanol recovery process. First, I apologize for taking so long in responding to your request. I hope this delay has not caused you any problems.

With respect to your specific questions, the following is our interpretation of how this process is regulated under the hazardous waste rules:

1. Stream A, the methanol-laden air from the drying and granulation step of the process, does not meet the definition of a solid waste under RCRA because it is in vapor form and not confined in a container.

2. The carbon beds that both condense and adsorb the methanol from the air contains an F003 waste when the condensation of methanol occurs. Therefore, stream B, the carbon/methanol mixture is to be handled as a listed hazardous waste.

3. The solvent stripper is used to recover the spent carbon. Therefore, this process is not subject to regulation. See 40 CFR 261.6(c)(1). However, any residues (stream C) derived from it is considered an F003 waste. The spent carbon, which is the recovered product, is not a solid waste.

4. Stream C, the condensed steam/methanol mixture is a hazardous waste because it was derived from treating a hazardous waste (see 40 CFR 261.3(c)(2)(i)) and stream C would remain a hazardous waste, unless it is delisted under the provisions of 40 CFR Sections 260.20 and 260.22 or is mixed with another solid waste (see 40 CFR 261.3(a)(2)(iii).

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3. Since stream C is hazardous (unless it is delisted or has been mixed with a solid waste), then downstream tank 4 would be subject to RCRA hazardous waste regulations. Stream F is also derived from the treatment of a hazardous waste and, therefore, would be a hazardous waste. As you are aware, if stream F were sent to a POTW or discharged under an NPDES permit, then it would not be subject to RCRA regulations.

I hope this clarifies your concerns about the waste streams from this process. If you require additional information, please feel free to call Ed Abrams at FTS-382-4787.

EXHIBIT D

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

FEB 9 1987

Mr. Gary N. Dietrich, Senior Vice President
ICF Technology
International Square, 1850 K Street, NW
Washington, DC 20006

Dear Gary,

I recently received your letter of December 8, 1986 in which you discussed Vertac Chemical Company's closure plan for the hazardous waste storage units at its shutdown manufacturing plant at Jacksonville, Arkansas. As I understand the problem, Vertac is under administrative order from the State of Arkansas, with Region VI support, to submit a revised closure plan for the storage units which contain F020 and F023 wastes. The central feature of the closure plan would involve the on-site incineration of approximately 17 million pounds of F020 and F023 waste.

You asked a number of questions and raised many provocative issues regarding the regulatory status of these wastes. You state that as the rules stand now, you cannot advise your client to initiate incineration of its stored wastes, until the availability of disposal options for the residues become more certain.

Below, I will attempt to answer your questions. I will also discuss some contemplated changes to our regulations which may alleviate some of the current problems which you described.

2,4-D Process Wastes

QUESTION 1: Does EPA in its final promulgation of the September 12, 1985 "residue rule", intend to implement the statement in the last paragraph of 51 FR 40615 by requiring that F029 wastes be disposed in a permitted landfill that meets the special requirements of 40 CFR 264.317?

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SURNAME	[illegible]		See Yellow Sheet	CARSON				
DATE	2/4/87			1/28/87				

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EPA Form 1320-1 (12-70)

U.S. GPO 1986-[illegible]

As you know, the September 12, 1985 proposed residue rule has not yet been promulgated. As proposed, wastes resulting from the incineration or thermal treatment of EPA Hazardous Waste Nos. F020 to F023, F026, and F027 that contain (at the incinerator feed nozzle) less than 10 ppm of TCDD equivalents are toxic (T) instead of acute hazardous (H) waste. These wastes would be designated as EPA Hazardous Waste No. F029. As an F029 waste, they would not be acute hazardous wastes and therefore, would not be subject to the special management requirements of 40 CFR 264.317. The requirements of 40 CFR 264.317 apply only to F020-23, F026, and F027.

Since the September 12 proposal has not yet been finalized, these residues are still considered acute hazardous wastes; thus, the residues must be disposed of in a landfill that meets the special requirements of 40 CFR 264.317. However, if and when this proposal is finalized, the land ban final rule will be amended accordingly to allow these residues to be managed in accordance with the general waste management standards contained in 40 CFR Parts 264 and 265.

2,4,5-T Process Wastes

QUESTION 2: Must the residuals from the incineration of F020 wastes that don't meet the proposed 10 ppm TCDD equivalency test be designated as F020 wastes, and then manifested to a landfill disposal facility? and QUESTION 3: If the answer to the above question is yes, would there not be a rationale for proposing a rule change that would designate the residuals from the incineration of listed dioxin waste that meet the treatment standards of 40 CFR 268.41 by a different EPA Hazardous Waste Number than that born by the original waste?

According to 40 CFR 261.3(b)(2)(i), any solid waste generated from the treatment, storage or disposal of a hazardous waste... is a hazardous waste. The "derived from" waste carries the same EPA Hazardous Waste designation as the original waste.

As proposed, the September 12, 1985 residue rule designates residues resulting from incineration of F020-F023 F026, and F027 wastes as F029 (T) only when the wastes contain less than 10 ppm TCDD equivalents at the feed nozzle. Residues resulting from incineration of F020 wastes, where the waste exceeds 10 ppm TCDD equivalents at the incineration nozzle, are therefore still acute hazardous waste and must be manifested as a F020 waste.

I should point out that as proposed, the 10 ppm level applies to the TCDD equivalents at the incinerator feed nozzle rather than the level in the waste. This recognizes the fact that wastes are seldom incinerated singly and are often mixed to achieve proper characteristics such as proper heat value.

In answer to question 3, there is no justification (at the present time) for a rule change that would designate the residuals from the incineration of listed dioxin waste that meet the treatment standards of 40 CFR 268.41 by a different EPA Hazardous Waste No. Attainment of the treatment standards only ensures that the waste can be safely land disposed in accordance with the special management requirements of §264.317 for hazardous wastes F020-F023, F026, and F027; it does not necessarily mean, that the waste is not hazardous. These wastes may, however, be delisted or redesignated as toxic wastes pursuant to §260.20 and 260.22.

QUESTION 4: Is it really EPA's intent to require that listed dioxin wastes that have been treated to meet the treatment standard of 40 CFR 268.41 be landfill disposed only in a landfill that meets the special requirements of 40 CFR 264.317?

Yes. According to the requirements of 40 CFR 268.41, the wastes do not have to be treated, they merely have to meet the treatment standards. If the treatment standards are met, then waste can be safely managed at a facility meeting the special treatment standards for F020-F023, F026, and F027 wastes. These standards help prevent problems associated with run-off or wind dispersal of contaminated particles and the problems associated with the co-disposal of these wastes with other materials that may mobilize dioxins.

If and when the September 12, 1985 proposed residue rule is promulgated, the land ban final rule would be amended accordingly to allow these residues to be managed in accordance with the general waste management standards contained in 40 CFR Parts 264 and 265.

Contaminated Debris

QUESTION 5: Can debris, that is or potentially is contaminated with 2,4-D product or raw materials or intermediates that were used in the production of 2,4-D, be designated as D016 wastes (instead of F023) and be disposed of in an interim status or permitted hazardous waste landfill?

The F023 listing covers wastes from the production of materials on equipment previously used for the production or manufacturing use of tri- and tetrachlorophenols. The wastes from the production of 2,4-D are not explicitly covered by the dioxin listings. Wastes from the manufacture of 2,4-D on equipment previously used to manufacture tri-or tetrachlorophenol, however, are covered by the F023 listing. Wastes from the manufacture of 2,4-D on equipment that was not previously used to manufacture tri- or tetrachlorophenol are not covered by the listing. These wastes may, however, be D016 if they fail the characteristic for EP Toxicity.

2,4,-D commerical product is also not covered by the listing but is subject to the requirements of §261.33(f). If the debris (wooden boxes, cartons, and tarps) are contaminated with 2,4,-D waste which did not come from equipment used to produce tri- or tetrachlorophenols, the debris may be D016.

Therefore, you are correct in your interpretation that the following wastes are D016:

- empty bags that contained technical 2,4-D that were emptied according to 40 CFR 261.7;
- filter paper used to clarify formulations.

You are also correct that the equipment used to produce tri- or tetrachlorophenols, when discarded, is not covered by the scope of the listing.

QUESTION 6: Does the mixture rule of 40 CFR 264.3(a)(2)(iv) apply to articles that are contaminated with listed hazardous wastes, thereby requiring pallets potentially contaminated with F023 wastes to be designated as F023 wastes?

The mixture rule does not apply to the pallets contaminated with listed wastes. Under the regulations, the pallets are not considered solid waste, since it is not "discarded" in the sense of being abandoned, recycled, or inherently waste-like as those terms are defined in the regulations. See 40 CFR 261.2(a)-(d). The contaminated pallets can not be considered a hazardous waste via the mixture rule (i.e., to have a hazardous waste mixture, a hazardous waste must be mixed with a solid waste; see 40 CFR 261.3(a)(2)(iv)). Nevertheless, the pallets are contaminated with a listed waste and are therefore still subject to regulation since they contain a hazardous waste. The treatment, storage, or disposal of the pallets contaminated with hazardous waste must be handled as if they themselves were hazardous waste. However, if the pallets are treated such that they no longer contain the hazardous waste, the pallets would no longer be subject to regulation under Subtitle C of RCRA. This interpretation would also apply to discarded glassware, gloves, boots, coveralls, aprons, and rags contaminated with listed waste.

I hope this adequately answers all of your questions. We are acutely aware of many of the problems associated with dioxin disposal and are trying to find solutions on a number of different fronts. We are currently responding to a petition from the Hazardous Waste Treatment Council. The Council has petitioned the Agency to incorporate the delisting process into a facility's operating permit. This would allow delisting of wastes that meet the delistable levels set in the permit. We are also re-evaluting the "residue rule" to determine how quickly we can go forward with promulgation.

As you requested, I am designating Doreen Sterling of my staff to serve as your point of contact on these issues. If you have any further questions, please contact her at (202)475-6775.

Sincerely,

Marcia Williams, Director
Office of Solid Waste

cc: Mark Greenwood
David Bussard

WH-562B/DSterling/bc/RmS242/1/2/87/475-6551/DS 8408

EXHIBIT E

ENVIRONMENTAL CONTROL
UNION 76 DIVISION

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MJD
HHJ
KEG
FILE:

SEP 11 1985

AUG 23 1985

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

MEMORANDUM

SUBJECT: Applicability of the "Mixture" and "Derived From" Rules to Petroleum Refinery Wastewater Systems

FROM: John H. Skinner, Director
Office of Solid Waste

TO: Director, Waste Management Division
Regions I-X

Over the past year, we have received several requests from Regions VI and VIII for interpretations relating to the conditions under which sludges generated in refinery surface impoundments are hazardous. Many of those questions should have been answered by our December 7, 1984 memorandum to Robert Duprey, a copy of which is attached. The Administrator has recently received a petition from the Texas Mid-Continent Oil and Gas Association (TMOGA) that raises the question of whether the "mixture" and "derived from" rules provide a basis for the regulation of these units. We hope that this letter provides sufficient guidance on this issue to insure the proper application of the "mixture" and "derived from" rules to refinery wastewater systems.

Five waste streams generated by petroleum refineries are currently listed in 40 CFR 261.32. Based on a review of the American Petroleum Institute's 1982 survey of refineries, we expect that as many as 40% of all refineries are performing some treatment of these wastes (primarily API Separator Sludge, DAF Float, or Slop Oil Emulsion Solids). Generally, the treatment involves some form of dewatering by sedimentation, filtration, or centrifugation. A literal reading of 40 CFR 261.3(c)(2)(i), the "derived from" rule, would suggest that the resultant liquid stream is a hazardous waste and remains one until delisted. Since refiners generally return the aqueous stream to the refinery wastewater system, the mixture rule (40 CFR 261.3(a)(2)(iv)) would then define the combined water stream and all subsequent residuals as hazardous wastes. (Note, however, that the effluent at the point of discharge from the wastewater treatment system would not be a solid waste by virtue of the industrial wastewater discharge exclusion, 40 CFR 261.4(a)(2).)

After careful consideration of the characteristics of the currently listed refinery wastes, the waste management practices, and the disposition of the recycle streams, we have concluded that the "derived from" rule is not uniformly applicable to the aqueous stream generated in a sludge dewatering process. Our interpretation is based on the presumption that properly conducted dewatering of a wastewater treatment residual will insure that none of the listed waste is returned to the system, while simultaneously reducing the total amount of waste generated. It is our opinion that dewatering of the currently listed refinery wastes can be conducted in a manner that insures the return of only the non-listed wastewater which came into contact with, but was not mixed with, the listed waste. This interpretation leaves a burden of proof on the facility to establish that they are "properly conducting" dewatering.

We believe that the demonstration of properly conducted dewatering can be made by the plant by conducting waste analysis. Specifically, if the refinery can show, to your satisfaction, that the return water stream is chemically equivalent to the non-listed wastewater influent to the wastewater treatment device that originally generated the listed waste, then the return water stream is not "derived from" the hazardous waste. It should be noted that this demonstration cannot be made if the influent to the waste treatment unit itself contained a listed hazardous waste. In this case, all waste derived from its treatment would be hazardous since the original wastewater was hazardous.

As an example, consider a refinery that generates an API separator sludge; suppose that the refinery pumps this listed hazardous waste to an impoundment for sludge dewatering, after which the sludge is sent to a landfarm and the water supernatent is sent to the influent to the API Separator. If the returned water stream is similar in composition of Appendix VIII hazardous constituents and total suspended solids (TSS) to the influent wastewater to the API Separator, then only the non-listed wastewater is being returned and the return wastewater is not a hazardous waste. On the other hand, if the level of some Appendix VIII constituent or the TSS is significantly higher than the level in the API separator influent, then hazardous waste is being returned to the wastewater treatment system and the mixture rule is triggered for the entire wastewater system.

What constitutes a significantly higher constituent level is obviously a case-by-case determination that is functionally dependent upon the amount of sampling data available. We will be glad to provide an opinion for any specific case if you forward the required information on the waste streams. It

should be noted, in passing, that the dewatering impoundment is a regulated unit regardless of the regulatory status of the water stream since this unit is being used to treat and store a hazardous waste.

Application of the above rules has major implications for refineries that are returning hazardous waste to their wastewater treatment system. At these facilities, all downstream units are hazardous waste management units. Beyond that, all residuals generated downstream are hazardous wastes, unless an upstream or influent wastewater mixture, or the residual itself, has been delisted by the Agency. We are concerned that the net effect of these rules, when coupled with the closeness of the Part B submission deadline, may cause major problems for refiners who were practicing the desirable activity of waste minimization, but were not operating in a systematic fashion. We cannot, however, justify a blanket exemption from the mixture rule for all of the recycled liquid streams.

Our hesitation to grant a blanket exemption is based on the fact that the limited data which we have available at this time (data supplied by the American Petroleum Institute) suggest that the liquid streams can contain appreciable amounts of Appendix VIII hazardous constituents from the hazardous waste. Calculations performed by my staff further suggest that major portions of the constituents found in downstream wastewaters can result from the introduction of the recycle stream.

Nevertheless, we do believe there are cases where a rigid application of the two rules results in a less desirable outcome. Unfortunately, our procedural options are rather limited. The rules have been final for several years and revision at this point would require issuing a proposal, along with providing an opportunity for public comment. We could not justify starting such an effort until we receive meaningful data from TMOGA or other petitioners. In the interim, the sole available mechanism for regulatory relief is through the delisting process.

Fortunately, some refineries have correctly interpreted the subject rules and are working to submit their Part B's in November, as required. We believe, however, that a much larger contingent of refineries may not be exerting any effort, due to a misinterpretation of the rules or the hope that EPA will ignore the rules. Since those facilities would lose their interim status for the affected units, it is imperative that your staff notify them of their responsibilities at the earliest possible date. Facilities which fail the test on the return water stream will need to submit a delisting petition if they hope to receive an exclusion for their recycled liquid streams.

Since there is potential for significant economic impact, we will perform an expedited review of all complete petitions that are received. The 1984 amendments, however, do not leave us the option to grant a temporary exclusion under 40 CFR 261.22(m). See also 50 FR 28, 737, July 15, 1985. Specific information that is required of a delisting petitioner is described in the guidance manual for delisting petitions; petitioners should take extra care to insure that Appendix VIII characterizations are provided for all wastes that are being treated, the recycled liquid streams, the wastewaters receiving the recycled streams, and the non-recycled residuals of treatment. It is also important that all analyses be representative of the long term variations in the quality of the recycled stream and factors that contribute to that variation. Complete volumetric and phase characterizations for all streams and data defining their variability are also essential. Due to the tight time constraints involved, petitioners may want to contact Jim Poppiti of my staff, at (202) 475-8551, before making their submissions.

In the way of guidance to your staffs, it is also essential that they understand and consistently apply the definitions of the wastes to insure that facilities are not erroneously categorized. Clearly, recycled streams are not regulated if the hazardous waste has not been generated. It may be useful to clarify the point of waste generation and associated applicability of the rules. They are as follows:

K048 (DAF Float) - Generated at the moment they are formed in the top of the unit. Any liquid stream deriving from the concentration of K048 could be derived from a hazardous waste.

K049 (Slop Oil Emulsion Solids) - This waste, sometimes referred to as middle layer emulsion, is generated at the first instance where the emulsion layer is allowed to form. The layer will form in the first vessel to which slop oils are pumped from the wastewater system. With one exception, the wastewater from this first tank need not be evaluated for the "derived from" test. The case where it would require testing is where a hazardous waste, such as DAF Float, was introduced into the emulsion breaking tank. Water phase derived from any subsequent emulsion breaking or emulsion storage is subject to the "derived from " test.

K050 (Bundle Cleaning Sludge) - Mixtures containing this hazardous waste which are part of the refinery wastewater system are exempted from the mixture rule (40 CFR 261.3(a)(iv)(c)).

K051 (API Separator Sludge) - Generated at the moment of deposition in the API separator. Note that deposition is defined as a condition where there has been at least a temporary cessation of lateral particle movement. Liquids derived from the management of API Separator Sludge after its removal from the separator (e.g., centrifuging) must be evaluated to establish whether or not they are "derived from" the hazardous waste.

K052 (Leaded Tank Bottoms) - Generated at the moment of deposition in the gasoline storage tank. Section 261.4(c) excludes the tank from regulatory requirements. Any portion returned to the wastewater systems must be tested under the "derived from" rule.

This memorandum should clarify (when applied in concert with our previous guidance on scouring, slop oil systems, and waste reactivity) the regulatory status of most refinery wastewater impoundments. Do not hesitate to contact Ben Smith of my staff (FTS: 382-4791), if you have any additional questions on this or other refinery related matters. We will keep you apprised of our progress with the TMOGA petition and our waste listing efforts.

Attachment ? (NOT INCLUDED.)

EXHIBIT F

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

SEP 15 1995

Mr. Peter C. Wright
Monsanto Company
800 N. Lindbergh Boulevard
St. Louis, Missouri 63167

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Dear Mr. Wright,

I am writing in response to your letter of January 3, 1995, in which you requested clarification of the RCRA "contained-in" policy. In your letter you asked several specific questions regarding this policy, and we offer our responses below. It should be understood that these responses reflect the Agency's current interpretation of the contained-in concept; in the Hazardous Waste Identification Rule for Contaminated Media (HWIR-media), currently under development, we will be looking closely at the contained-in policy and other issues associated with contaminated media and will be addressing those issues through the rulemaking process.

Question 1. Can a State determine whether or not soils which contained a listed hazardous waste, but were then treated to below health based concentrations, no longer contain the hazardous waste?

The contained-in policy is intended to clarify the application of RCRA hazardous waste regulations to environmental media. As stated in previous guidance on this policy, contaminated media are not considered solid wastes in the sense of being abandoned, recycled, or inherently waste-like as those terms are defined in RCRA regulations. However, environmental media that contain listed hazardous wastes must be managed as hazardous wastes because--and only as long as--they contain listed waste(s)[1]. EPA Regions and authorized states may apply the contained-in policy to determine site-, media- and contaminant-specific levels, such that if the concentration of the hazardous constituents in the environmental media fall below these levels, the environmental media may be determined to no longer contain hazardous waste. Such "contained-in determinations" may be made before or after treatment of the contaminated environmental media and may include consideration of site-specific exposure pathways (e.g., potential for human exposure, soil permeability, depth to groundwater).

[1] June 19, 1989 letter from Jonathan Cannon, Acting Assistant Administrator of EPA's Office of Solid Waste and Emergency Response to Thomas Jorling, Commissioner of the New York Department of Environmental Conservation.

Recycled/Recyclable

Question 2. Are soils that have been treated and then determined not to contain hazardous wastes still subject to the Land Disposal Restrictions (LDRs) Universal Treatment Standards (UTS) prior to land disposal?

Yes. If contaminated environmental media are treated and then determined to no longer contain hazardous waste, the LDR treatment standards still must be complied with prior to land disposal. This means that the media would have to be treated to meet UTS or a treatability variance would have to be obtained[2]. Individuals who believe that the UTS are not appropriate for media containing solid waste are encouraged to work with their State regulatory agency and the appropriate EPA Regional Office to obtain a site-specific treatability variance under 40 CFR §268.44(h). EPA's policy is that site specific treatability variances are presumed to be appropriate for contaminated media. See 55 FR 8760 (March 8, 1990) For more information on site specific treatability variances granted in the context of environmental cleanup, please refer to the Superfund LDR Guides Numbered 6A and 6B, entitled, *Obtaining a Soil and Debris Treatability Variance for Remedial Actions* and *Obtaining a Solid and Debris Treatability Variance for Removal Actions*, respectively. For your convenience, copies of these guidance documents are enclosed.

Of course, if no land disposal will occur, the LDR treatment standards do not apply. Additionally, contaminated environmental media determined not to contain any waste (i.e., it's just media), would not be subject to any RCRA Subtitle C requirement, including the LDRs.

Question 3. If groundwater that originally exhibited a hazardous characteristic is subsequently treated to below a State-determined contained-in level, would the ground water still be subject to the UTS requirements prior to land disposal?

Yes. Once the LDR treatment standards attach to characteristic wastes, even if the characteristic is eliminated, the media remain subject to any applicable LDR treatment standards that have not been met through removal of the

---

[2] Nothing in this letter is intended to affect the status of existing regulatory or statutory exclusions to the definition of solid or hazardous waste. Such provisions can prevent the duty to comply with LDRs from attaching in the first instance. See, e.g., RCRA § 1004(27) (exempting industrial point source discharges subject to Clean Water Act permits from the definition of solid waste). In addition, the Agency does not intend in this letter to expand the scope of activities that constitute land disposal and thus trigger LDR treatment requirements. For example, the Agency's positions that in situ treatment and movement of contaminated media within an area of contamination do not constitute land disposal remain unaffected. Similarly, this letter is not intended to affect any statutory or regulatory exclusions to the requirement to comply with LDRs (see e.g., RCRA § 3020(b)).

characteristic. As indicated in the Third Third decision, Chemical Waste Management v. U.S. EPA, 976 F.2d 2 (D.C. Cir. 1992), cert. denied, 1135 S.Ct 1961 (1993), elimination of the characteristic does not necessarily satisfy LDR requirements. If groundwater that exhibits a characteristic is treated prior to land disposal, it must be treated in accordance with applicable LDR treatment standards or pursuant to a treatability variance to meet LDR requirements. As discussed in our response to question 2, individuals who believe that the UTS are not appropriate to their contaminated media are encouraged to apply for a site specific treatability variance.

Of course, if no land disposal will occur, the LDR treatment standards do not apply. Additionally, ground water managed in accordance with one of the existing statutory or regulatory exclusions may not be subject to the LDR treatment standards even when land disposal will occur. For example, under RCRA § 3020(b), contaminated groundwater may be treated in accordance with a cleanup action and then reinjected into the aquifer from which it was withdrawn without meeting LDR treatment standards, provided the treatment substantially reduces the hazardous constituents prior to reinjection and the cleanup action will, upon completion, be sufficient to protect human health and the environment.

Question 4. May a State that is authorized only for the base RCRA program make contained-in determinations, or does the State need to be authorized for the LDRs as well?

In order to make contained-in determinations, a State must only be authorized for the part of the base program under which the waste of concern is identified as hazardous. For example, when determining whether or not a medium contains a particular characteristic waste, the State must be authorized for that characteristic. In the same manner, if the State wishes to determine whether or not a medium contains a particular listed waste, that State must be authorized for that particular waste listing. In regard to the two sites described in your letter, both Massachusetts and Texas are authorized for the base program under which the wastes you mentioned are identified as hazardous, and may, at their discretion, make the contained-in determinations you described.

Question 5. Do contained-in determinations needed to be made under a RCRA permit, or can another mechanism be used?

Authorized states and EPA regions may use any format or mechanism to document contained-in determinations. These mechanisms could include official agency correspondence, orders, and RCRA permits.

We hope this will be of assistance to you in applying the

contained-in policy. If you have any further questions, please contact Elizabeth McManus, of my staff, at (703) 308-8657. In addition, please note that authorized states have their own regulations and policies which may be more stringent than federal regulations and policies. In authorized states, questions about application of the contained-in policy, including the interpretations put forth in this letter, should be referred to the appropriate state agency. In Texas, please contact Paul Lewis of the Texas Natural Resources Conservation Commission at (512) 239-2340; in Massachusetts, please contact John Carrigan of the Massachusetts Department of Environmental Protection at (617) 292-5584.

Sincerely,

Michael Shapiro
Director, Office of Solid Waste

Enclosure

cc: Matt Hale, OSW, PSPD
David Bussard, OSW, CAD
Jim Berlow, OSW, WMD
Larry Starfield, OGC
Dawn Messier, OGC
Barbara Pace, OGC
Bruce Diamond, OECA, OSRE
US EPA Regional RCRA Branch Chiefs, Regions I - X
John Carrigan, State of Massachusetts
Susan Ferguson, State of Texas

EXHIBIT G

AREA G ASPHALT SAMPLING AND ANALYSIS PROJECT RESULTS

March 18, 1998

Prepared for:

Los Alamos National Laboratory
Environmental Management-Solid Waste Operations

Los Alamos National Laboratory
Hazardous and Solid Waste Group

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TABLE OF CONTENTS

Executive Summary 3

1.0 Introduction 5
- 1.1 Background 5
- 1.2 Objective 7

2.0 Site Description 8
- 2.1 Building 281 Pile 8
- 2.2 Pit 37 Pile 8

3.0 Sampling Activities 10
- 3.1 Sampling Locations 10
- 3.2 Number of Samples 10
- 3.3 Sampling Procedures/Equipment 11
- 3.4 Sample Quality Assurance/Quality Control 12
- 3.4.1 Duplicates, Field Blanks and Equipment Rinse Blanks 12
- 3.4.2 Trip Blanks and Method Blanks 13
- 3.4.3 Chain of Custody Procedures 14
- 3.5 Deviation from Sampling and Analysis Plan 14

4.0 Analytical Laboratory Analyses 15
- 4.1 Analytical Procedures 15
- 4.2 Method Blanks 15

5.0 Risk Screening Process 16

6.0 Conclusion 18

Table 1: Volatile Organic Constituents in Pad AA Asphalt and Soil 7
Table 2: Number of Asphalt and Soil Samples Collected 10
Table 3: Analytical Methods used by Barringer Laboratory 15

Figure 1: TA-54 Site Plan 19
Figure 2: Area "G" Site Plan 21
Figure 3: Area "G" Asphalt/Soil (near Bldg. 281) 23
Figure 4: Area "G" Asphalt/Soil (in Pit 37) 25

Attachment 1: Sampling and Analysis Plan A-1
Attachment 2: Risk Screening Analysis A-2

EXECUTIVE SUMMARY

In 1994 Los Alamos National Laboratory proposed construction of a storage dome at Technical Area 54 (TA-54), Area L. The purpose of the dome was to provide protected storage of mixed waste containers that were, at that time, being stored outside on an asphalt pad without a cover. Prior to removal of the old asphalt pad (hereafter referred to as Pad AA) and installation of the new storage dome, Pad AA asphalt and underlying soil were sampled for Volatile Organic Compounds (VOCs). Sampling was conducted (in 1994) because of concerns that the asphalt might be contaminated with VOCs from the underlying, subsurface vapor plume. Laboratory analyses indicated that Pad AA was contaminated with low levels of VOCs including trichloroethylene, 1,1,1-trichloroethane, perchloroethylene and chloroform. Volatile Organic Compound contamination ranged from no detection to 2.43 parts-per-million.

In 1995 a small volume of damaged asphalt and soil (approximately 40 yd^3), which was located adjacent to Pad AA, was removed and transported from TA-54, Area L to the current location of the Compactor Building in TA-54, Area G. This asphalt/soil was brought to Area G for use as base course while constructing the pad for the Compactor Building; however the contractor for the construction project decided not to use this asphalt. This asphalt was not sampled when Pad AA was sampled in 1994 as it was adjacent to, but not part of Pad AA. Since placement in Area G, additional material (mostly soil) has been added to the original asphalt, and the pile (original asphalt plus added material) has been relocated to its present location east of the Compactor Building. In 1996 approximately four dump truck loads of asphalt and soil were removed from the pile east of the Compactor Building and placed in the Los Alamos County Landfill, and approximately 15-20 dump truck loads of the asphalt/soil mixture were removed from the pile east of the Compactor Building and placed in Pit 37 at Area G. After removal of asphalt for transport to the Los Alamos County Landfill and Pit 37, additional material was again added to the pile east of the Compactor Building. The current estimated volume of the asphalt/soil pile east of the Compactor Building is 300-400 yd^3. The current estimated volume of the asphalt/soil materials placed in Pit 37 is 225-300 yd^3.

In 1997 LANL conducted the *Area G Asphalt Sampling and Analysis Project* which involved extensive sampling and analysis of the asphalt/soil mixture located in Area G in the pile east of the Compactor Building and in Pit 37. The objectives of the Project were to 1) determine if the asphalt/soil mixture east of the Compactor Building and in Pit 37 was contaminated with VOCs resulting from the original asphalt's (40 yd^3 from Area L) contact with the vapor plume at levels posing a risk to human health or the environment, 2) relate contamination in the asphalt/soil at Area G to the materials placed in the Los Alamos County Landfill and 3) use the data from sampling and analyses to perform an evaluation to determine the potential risk associated with leaving disposed asphalt in place.

Observations from reviewing sampling and analytical results indicate the following:

- In general, the results of the 1997 sampling and analysis are consistent with data from sampling and analysis of asphalt/soil from Pad AA (in 1994).
- It appears that the trace levels of VOCs sorbed to asphalt are not disseminating significantly into the environment.
- Neither the asphalt/soil located east of the Compactor Building nor the asphalt/soil placed in Pit 37 contain hazardous constituents at levels exceeding regulatory limits.
- A risk screening evaluation using the analytical data from sampling shows that there are no constituents of concern in asphalt or soil which exceed Screening Action Levels.
- Since soil concentration levels of constituents at the Screening Action Levels represent a risk of 1E-06, it can be stated that sample results demonstrate the risk of leaving these constituents in place is less than 1E-06, and therefore not significant.
- Sampling and analysis and subsequent risk screening indicate that the risk associated with the chemical constituents ubiquitous in asphalt and petroleum products exceeds the risk associated with the presence of VOCs sorbed to the asphalt during its residence at TA-54, Area L.

1.0 INTRODUCTION

1.1 Background

Los Alamos National Laboratory (LANL) has operated a solid, low-level radioactive waste (LLW) disposal facility in Area G at Technical Area 54 (TA-54) since 1957. Current Area G operations continue to include disposal of LLW. In addition, low-level mixed waste (LLMW), transuranic (TRU) and mixed transuranic waste are currently stored at Area G. An adjacent area, designated Area L, has been previously used for disposal of various types of hazardous waste including volatile organic compounds (VOCs). Area L is currently used for storage of hazardous waste, LLMW, PCBs and New Mexico Special Waste. See Figure 1 for a site map of TA-54.

Past practices at Area L involved storage of LLMW in containers (typically 55-gallon drums) on an outdoor asphalt pad (hereafter referred to as Pad AA). Pad AA was bermed to control run-on/run-off and to segregate incompatible wastes, but it was not covered. In 1994 LANL proposed a project to construct a dome for storage of LLMW at Area L. The storage dome was intended to protect waste from the elements. Pad AA was moderately degraded from years of use, and was smaller than the footprint of the proposed new storage dome. Therefore, it was decided to remove Pad AA and construct a new asphalt pad for placement of the storage dome.

Prior to removal of Pad AA, it was sampled in place to establish whether contamination from the underlying subsurface vapor plume existed. During April 1994, personnel from LANL's Hazardous and Solid Waste Group used a jackhammer to remove asphalt and soil for sampling and analysis from three locations on (or near) Pad AA. Additional asphalt and soil samples were also collected from TA-54 West for use as a baseline. All samples were analyzed for VOCs only, and analytical results from this sampling effort indicated that the asphalt (and underlying soil) from Pad AA were contaminated with trace levels of VOCs. The baseline samples contained no VOCs. Table 1 contains information on the VOCs detected in the asphalt and soil from Pad AA and the baseline sample.

Pad AA was removed over a period of weeks during the summer of 1995. The excavated asphalt and soil from Pad AA was reused as backfill to attain the required grade for the new pad (for storage dome 215). Once the grade and compaction were attained for the new asphalt pad, and the concrete ring wall was installed, it was determined that portions of the asphalt directly south of the new pad area (outside the ring wall) had been damaged and needed to be replaced. The damage was caused by construction equipment during preparation of the area where the new asphalt pad was to be placed. This damaged asphalt (approximately 40 yd^3) was removed, and in June 1995 it was transported from Area L to the current location of the Compactor Building (Building 281) in Area G. This asphalt was brought to Area G for use as base course during construction of the pad for Building 281; however, the contractor decided not use it. The asphalt and soil, which was transported to Area G in 1995, was not sampled when Pad AA was sampled in 1994 as it was adjacent to, but not part of Pad AA.

Since the asphalt from Area L was placed in Area G in 1995, the following have occurred:

- Material was added to the original asphalt during 1995.
- The pile (original asphalt plus added material) was relocated – in 1996 the pile was moved to its present location just east of Building 281 (approximately 80 feet to the east of its original location).
- In April 1996 approximately four loads of the asphalt/soil (≈60 yd^3) were placed in the rubble pile at the Los Alamos County Landfill (hereafter referred to as the Rubble Pile).
- In April 1996 approximately 15-20 loads of asphalt/soil mixture (≈225-300 yd^3) were placed in Pit 37 at Area G.
- After removal of asphalt for transport to Pit 37 and the Rubble Pile, additional material was again added to the pile during 1996. The current estimated volume of the asphalt/soil pile east of Building 281 is 300-400 yd^3. The current estimated volume of the asphalt/soil materials placed in Pit 37 is 225-300 yd^3.
- In 1997, samples of asphalt and soil were collected and analyzed for VOCs, semi-volatile organic compounds (SVOCs) and inorganics (RCRA metals).
- In 1998, a risk evaluation was completed which showed the risk associated with leaving disposed asphalt (contaminated with VOCs) in place to be less than 1E-06.

1.2 Objective

In August 1997 LANL proposed to conduct extensive sampling and analysis of the asphalt/soil mixture located in Area G in the pile east of Building 281 and in the Pit 37 "pile". Based on preliminary in-place sampling of asphalt and soil from Pad AA, the principal constituents of concern associated with the piles of asphalt/soil in Area G are VOCs; specifically chloroform, 1,1,1-trichloroethane, trichloroethylene and perchloroethylene. The objectives of the *Area G Asphalt Sampling and Analysis Project* were to:

- Determine if the asphalt/soil mixture in the pile east of Building 281 and in the Pit 37 "pile" are contaminated with VOCs as a result of the original asphalt's contact with the organic vapor plume (at Area L) at levels that pose a risk to human health and the environment.
- Relate contamination in the asphalt/soil at Area G to the materials placed in the Rubble Pile.
- Use the data from sampling and analyses to perform an evaluation to determine the potential risk associated with leaving disposed asphalt in place.

Table 1: Volatile Organic Constituents in Pad AA Asphalt and Soil.

SAMPLE	CONTAMINANT	Concentration (ppm)
54-L-1, Asphalt	1,1,1-Trichloroethane Trichloroethylene Perchloroethylene	0.015 0.0128 0.223
54-L-1, Soil	Perchloroethylene	0.057
54-L-2, Asphalt	Chloroform 1,1,1-Trichloroethylene Trichloroethylene Perchloroethylene	0.00528 0.299 0.197 2.16
54-L-2, Soil	Trichloroethylene Perchloroethylene	Present below detection limit 0.0114
54-L-3, Asphalt	1,1,1-Trichloroethane Trichloroethylene Perchloroethylene	0.449 0.378 2.43
54-L-3, Soil	1,1,1-Trichloroethane Trichloroethylene Perchloroethylene	0.0455 0.156 0.0101
54-W-1, Asphalt	None	
54-W-1, Soil	None	

2.0 SITE DESCRIPTION

2.1 Building 281 Pile

This pile of asphalt/soil is located approximately 80 feet east of Building 281 inside the fenced area of TA-54, Area G (see Figure 2). The materials are in an open field with a slight north to south slope. The field is moderately vegetated with native grasses. Although, there are no natural drainage channels in the vicinity of the pile, it is possible for normal sheet flow of stormwater to occur in this area in the event of heavy storms. Silt fencing has been installed on the north, south and east sides of the pile, and it is roped off with signs to control access.

The asphalt/soil materials are arranged in several conical piles, with the edges of all the cones merging together. To ease description and sampling, the smaller conical piles are treated as a single, larger conical pile. The approximate dimensions of this larger pile are 90 feet (length) x 70 feet (width) x 12 feet (maximum height). The approximate volume of this pile is 300-400 yd^3. The approximate composition of the pile, based on visual inspection, is listed below:

- Soil: 95%
- Asphalt: 5%
- Concrete: <1%
- Wood/vitrified clay pipe: <0.1%

2.2 Pit 37 Pile

The asphalt/soil "pile" in Pit 37 is located approximately 80 feet from the east edge of the pit and approximately 25 feet from the south edge (see Figure 2). Upon placement of the asphalt/soil in Pit 37, that particular cell was closed. Closure involved placement of approximately two feet of crushed tuff as cover over the entire cell. Prior to sampling the asphalt/soil in Pit 37, the approximate location of the asphalt/soil materials was identified, as this was known to Area G operations personnel.

In order to collect samples, the tuff cover was removed from the asphalt/soil materials using a backhoe. The exact boundaries of the asphalt/soil materials were then established by digging with the backhoe to locate the interface between the asphalt/soil materials and other waste materials disposed next to the asphalt/soil.

The "pile" located in Pit 37 is in a disk shaped configuration with approximate dimensions of 35 feet (width) x 45 feet (length) x 4 feet (depth). The western edge of the asphalt/soil materials is bounded by uncontainerized waste including plastic bags containing used PPE and plastic, wood and large pieces of concrete with rebar. To the east the asphalt/soil materials are bounded by tangled rebar and large pieces of concrete with rebar (all uncontainerized). It is assumed that the uncontainerized waste on the eastern and western boundaries is contaminated with radiological constituents. Metal boxes (B-25 bins) which contain disposed radioactive waste bound the northern and southern edges of the asphalt/soil materials. The approximate volume of the asphalt/soil materials in Pit 37 is 225-300 yd^3. The approximate composition of the asphalt/soil materials in Pit 37, based on visual inspection, is listed below:

- Soil: 98%
- Asphalt 2%

3.0 SAMPLING ACTIVITIES

3.1 Sampling Locations

Stratified random sampling was performed on both asphalt/soil piles with asphalt and soil representing the two strata to be considered. Stratified random sampling was selected because systematic concentration differences were noted between the asphalt and soil phases in the preliminary characterization (Pad AA sampling in 1994).

In order to achieve statistically representative sampling, the following procedure was used to identify sampling locations for both piles:

- Each of the piles was surveyed using standard survey equipment to establish boundaries and depth.
- Using Computer Aided Drawing (CAD) software, a map of each pile was developed.
- Using CAD software, a 10-foot x 10-foot grid was established over a map of each of the piles. The boundaries of the grid extended beyond the boundaries of the piles.
- The exact X, Y and Z coordinates of each grid node which intersected the piles was entered into an Excel spreadsheet. Each set of X, Y and Z coordinates was assigned a consecutive number from 1 to the maximum number of X, Y, Z coordinate sets.
- Sample locations were chosen using a random number generator.

3.2 Number of Samples

Table 2 contains a summary of samples collected from each of the piles. Table 2 does not include field, equipment rinse or trip blanks.

Table 2: Number of Asphalt and Soil Samples Collected

SAMPLE TYPE	BUILDING 281 PILE		PIT 37 PILE	
	ASPHALT	SOIL	ASPHALT	SOIL
Total VOC	40	12	26	10
Total SVOC	15	6	13	5
TCLP Metals	15	6	13	5

Ten extra *Total VOC* asphalt samples were collected from the Building 281 pile than originally planned because the allotted holding time for extraction was exceeded for the first ten *Total VOC* asphalt samples collected. Even though the holding times had been exceeded for the first *Total VOC* samples, they were analyzed anyway. The samples for which the holding times had been exceeded are designated as (2) 97asph1A, (2) 97asph6A, (2) 97asph11A, (2) 97asph16A, and (2) 97asph21A. The replacement samples are designated as (2) 97asph223, (2) 97asph225, (2) 97asph227, (2) 97asph229, and (2) 97asph231. Replacement samples were not collected from the same locations as the original samples because the original sample locations had been disturbed in the interim.

The last four *Total VOC* asphalt samples [(2) 97asph200, (2) 97asph206], and the last two *Total VOC* soil sample [(2) 97asph211] collected from the Pit 37 "Pile" also exceeded the allotted holding time for extraction. Replacement samples were not collected, therefore the *Total VOC* analytical results for these samples are considered to be questionable.

3.3 Sampling Procedures/Equipment

To ensure consistent and appropriate sampling, a Sampling and Analysis Plan (SAP) was developed and reviewed prior to work being conducted. In addition, job specific ES&H Hazard Screening analysis, Special Work Permit and Radiological Work Permit were also prepared and reviewed prior to work being conducted. Sampling was conducted in accordance with the requirements of these documents. The final SAP, ES&H Hazard Screening analysis, Special Work Permit and Radiological Work Permit are included as Attachment 1.

Asphalt was sampled from both piles in the same manner. Sampling personnel wearing surgical gloves collected large chunks of asphalt from locations closest (within 3 feet) to the exact node to be sampled (exact location noted in the sampling logbook). The large chunks of asphalt were broken into smaller pieces using hammers. The small pieces of asphalt were then collected and transferred to the appropriate sample jars. If there was no asphalt within 3 feet of the exact sample node, then the next location was sampled instead.

Although headspace for VOC samples was minimized as much as possible during asphalt sampling, it was not possible to achieve zero headspace due to the size, matrix and irregular shape of the pieces of asphalt. All asphalt samples were preserved at 4 °C, and custody seals were attached to each sample jar at the time of sampling. See Figure 3 for a representation of sample locations.

Soil was sampled from both piles in the same manner. Sampling personnel wearing surgical gloves collected soil using a stainless steel hand trowel from the exact sample node. Soil was then transferred to the appropriate sample jars. Zero headspace for VOC samples was attempted during soil sampling. All soil samples were preserved at 4 °C, and custody seals were attached to each sample jar at the time of sampling. See Figure 4 for a representation of sample locations.

3.4 Sample Quality Assurance/Quality Control

3.4.1 Duplicates, Field Blanks and Equipment Rinse Blanks

One set each of duplicate samples, field blanks and equipment rinse blanks were collected and analyzed for every twenty waste samples. Duplicate samples, field blanks and equipment rinse blanks were analyzed for VOCs, SVOCs and Toxicity Characteristic Leaching Procedure (TCLP) metals. All duplicates and blanks were preserved at 4 °C.

Duplicate samples are submitted to determine the consistency of the laboratory's analytical procedures. Duplicate samples were collected in the following manner:

- A sufficient quantity of either asphalt or soil was collected from a particular grid node.
- The waste sample was collected from this quantity and placed into appropriate sample jars.
- Using the same sampling equipment (i.e., scoop, hammer, gloves, etc.), the duplicate sample was then collected from the remainder of collected material and placed into appropriate sample jars.

Field blanks were prepared/collected by filling the appropriate sample jar (in the field) with deionized water prior to sampling at the designated grid node. This sample jar was then maintained in the presence of personnel during sampling at the grid node. The sample was preserved using HCl to pH < 2 where appropriate and maintained at 4 °C.

Equipment rinse blanks are submitted to determine if samples are being contaminated in the field due to improper equipment decontamination. Equipment rinse blanks were prepared/collected in the following manner:

- Sampling equipment was decontaminated in the field in accordance with the approved SAP.
- A final rinse of the sampling equipment was conducted using deionized water. The final rinse water was collected in the appropriate sample jar for analysis.
- Equipment blanks were maintained at 4 °C and the sample was preserved using HCl to pH < 2 as appropriate.

3.4.2 Trip Blanks and Laboratory Method Blanks

One trip blank was collected and analyzed for each sampling day. Each trip blank was analyzed for VOCs. Trip blanks were prepared and sealed by LANL's Sample Management Office prior to the start of asphalt/soil sampling. These samples were maintained with sampling personnel during sampling, and then submitted for analysis. Trip blank sample jars remained closed at all times, were preserved at using HCl to pH < 2 and their temperature was maintained at 4 °C.

Method Blanks were prepared and analyzed by the analytical laboratory. See Section 4.2 for a complete discussion.

3.4.3 Chain of Custody Procedures

A chain of custody accompanied each sample jar from the time the sample was collected until it was received at the analytical laboratory. Relevant information recorded for each sample included sampling team members, sampling period (dates and times), sample identification number, material matrix, requested analysis and the signature of sampler.

3.5 Deviation from Sampling and Analysis Plan

In accordance with the SAP, deviations from approved procedures were approved by the Sample Team Leader, documented in the SAP and initialed by sampling team members. A summary of field changes to the SAP is provided below:

- The SAP was changed to allow the use of Isopropyl alcohol (IPA) for decontamination instead of Methanol.
- The SAP was changed to allow sampling of Asphalt/soil in place in Pit 37 rather than removal followed by sampling.
- The SAP was changed to allow the use of amber colored, glass sample jars for VOC samples.
- The SAP was changed to require that sampling equipment be air-dried after IPA rinse and again after final deionized water rinse.
- The SAP was changed to allow collection of either asphalt or soil from a particular sample location. As originally written, the SAP required that asphalt be collected from (at a minimum) the first fourteen locations sampled (in Building 281 pile) and soil from (at a minimum) the next six locations sampled (Building 281 pile). The SAP was revised to allow either asphalt or soil to be collected from a particular location, as long as the total number of asphalt and soil samples collected was unchanged.

4.0 ANALYTICAL LABORATORY ANALYSES

4.1 Analytical Procedures

Barringer Laboratory of Golden, CO conducted all analyses on the asphalt/soil samples. All laboratory analyses were conducted in accordance with, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publications SW-846. Table 3 contains a summary of analytical methods used by Barringer Laboratory.

Table 3: Analytical Methods Used by Barringer Laboratory.

ANALYSIS	MATRIX	SW-846 METHOD
Volatile Organic Compounds	Asphalt or Soil	8260
Semi-volatile Organic Compounds	Asphalt or Soil	8270
Inorganic (TCLP metals)	Asphalt or Soil	1311/6010/7470
Volatile Organic Compounds	Water	8260
Semi-volatile Organic Compounds	Water	8270
Inorganic (TCLP metals)	Water	1311/6010/7470

4.2 Barringer Control Samples

Barringer Laboratory has procedures in place for demonstrating control during each data collection activity. Barringer Laboratory's internal procedures require that Control Sample(s) are analyzed with each batch of customer's samples processed to verify that the precision and bias of the analytical process were within control limits.

Barringer Laboratory also analyzes a Method Blank with each batch of customer's samples processed to assess contamination levels in their laboratory. When detected in LANL's samples, methylene chloride was confirmed in most cases to be the result of analytical laboratory contamination. As a result, methylene chloride contamination has been discounted for those asphalt and soil samples exhibiting methylene chloride contamination at a concentration less than 10X the methylene chloride concentration in the corresponding Method Blank. (USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review).

5.0 RISK SCREENING PROCESS

The risk screening method used to determine risk to human health and safety associated with the disposition of asphalt in the Rubble Pile and in Pit 37 at TA-54, Area G, is based upon the soil screening methodology developed by the Environmental Protection Agency Region IX branch. This methodology was subsequently adopted for use by EPA Region VI. The intent and technical basis for development of soil screening levels is presented in three documents: "Soil Screening Guidance: User's Guide" (EPA/540/R-96/018), "Soil Fact Guidance, Fact Sheet" (publication 9355.4-14 FSA), and "Soil Screening Guidance: Technical Background Document" (EPA/540/R-95/128).

Soil screening is a methodology used to calculate risk-based, site specific, soil screening levels (SSLs) for contaminants in soil. An SSL is defined as the concentration of a specific chemical, located within a specific media that would result in a total body burden equating to an acceptable risk (1 E-06) for a given exposure scenario.

The original intent of SSLs was to provide an efficient way to identify areas needing further investigation at National Priorities Listing Sites. EPA Region IX soil screening methodology has been used in the state of New Mexico by the Los Alamos Environmental Restoration (ER) Program to identify ER sites that need further investigation. LANL risk based concentrations (called Screening Action Levels) have been submitted to and approved by EPA Region VI, and have recently been submitted to the New Mexico Environmental Department Hazardous and Radioactive Materials Bureau (HRMB) for review and approval.

A full suite of chemical testing was completed on the samples from the Building 281 pile and the Pit 37 "pile". Soil contaminant concentration levels established through sampling and analysis of asphalt/soil from these piles were compared to their respective LANL Screening Action Levels (SALs). Since each SAL represents an environmental concentration of a contaminant that corresponds to an "acceptable" risk, any concentration below a constituent's corresponding SAL correlates to an acceptable risk.

Attachment 2 shows the concentration of contaminants detected in sampling and analysis, and LANL SALs. The last column of the spreadsheet calculates a relative risk associated with the chemical concentration by multiplying the ratio of the chemical concentration to the respective SAL by 1 E-06. Continued exposure to the SAL concentration would result in a risk of 1 E-06 or less, therefore, a detectable concentration equal to the SAL would represent a maximum of 1 E-06 risk. A ratio of the concentration detected to the SAL concentration multiplied by the 1 E-06 provides an appropriate fraction of the risk represented by the SAL. It should be noted that Attachment 2 contains information on only those samples (including field, equipment and trip blanks) that exhibited some level of detectable contamination. Approximately 192 samples were submitted for analysis as part of the *Area G Asphalt Sampling and Analysis Project*, and approximately 68 of these exhibited no contamination at all.

Soil screening methods provide a rapid, efficient and conservative mechanism to assess risk. Soil screening levels have been developed assuming residential land use assumptions and related exposure scenarios. Other factors, including a limited transport scenario that limits the degradation and attenuation of the source term in the environment add additional layers of conservatism.

While identified constituents of concern (VOCs) were not detected in concentrations which represented a significant risk, other constituents commonly associated with asphalt and/or petrochemical products were detected including lead, and the polycyclic aromatic hydrocarbon (PAH) flouranthene. Polycyclic aromatic hydrocarbons are a group of chemicals that are formed during the incomplete burning of coal, oil and gas, garbage or other organic matter. Environmental contamination of lead is often due to automobile and industrial emissions. Although limited, sampling does indicate that lead and flouranthene are both present in concentrations greater than their respective SAL. These constituents and their concentrations are not considered relevant because each exceeded its SAL in only a single sample (lead in sample number 97asph23, flouranthene in sample number 97asph52), neither constituent exceeds a Toxicity Characteristic Leaching Procedure (TCLP) regulatory limit in any of the samples collected during the *Area G Asphalt Sampling and Analysis Project*, and both are common components of asphalt.

6.0 CONCLUSION

Sampling was conducted on the asphalt in question in 1994 and again in 1997. In general, the results of the 1997 sampling effort are consistent with the data from the 1994 sampling effort. It can be assumed that the trace levels of VOCs sorbed to the asphalt are not migrating significantly into the environment.

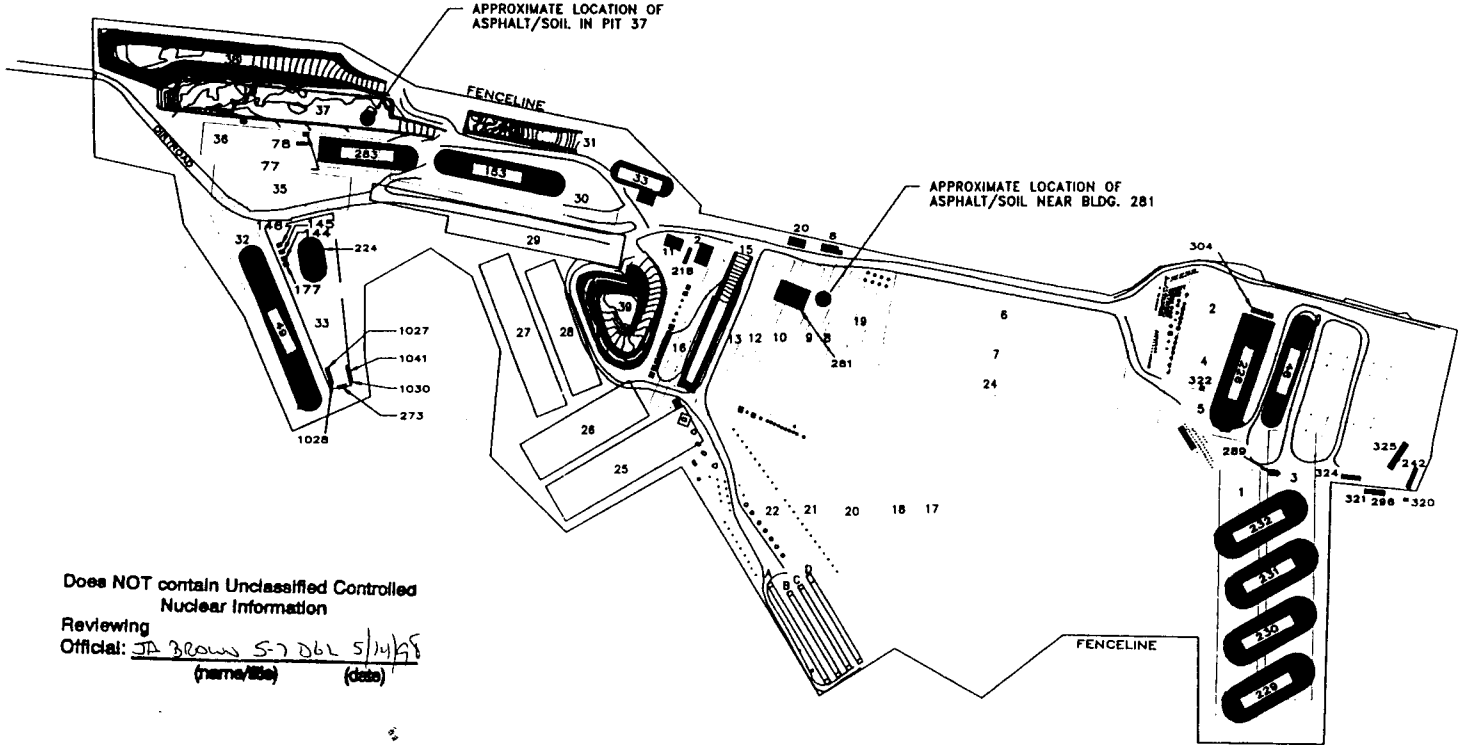
The intent of sampling and analysis, as well as the soil screening analysis was to determine the potential for human health effects associated with VOCs contaminating the asphalt/soil. Although VOCs and their respective health effects and risks were the primary driver for the 1997 sampling event, for the sake of thoroughness, each sample was further analyzed for the presence of other chemicals. With the exception of confirmed analytical laboratory contamination, detected concentration levels of VOCs were at least an order of magnitude below SALs in all of the samples collected. The incremented risk from the VOCs is less than one in a million, a risk level that is deemed acceptable from a CERCLA regulatory viewpoint.

Based upon the risk screening, the current disposition of the asphalt/soil from TA-54, Area G does not pose a risk to the public. Furthermore, as demonstrated in Attachment 2, sampling and analysis and subsequent risk screening indicate that the risk associated with the chemical constituents ubiquitous in asphalt and petroleum products exceeds the risk associated with the presence of VOCs sorbed to the asphalt during its residence at TA-54, Area L.

FIGURE 1: TA-54 SITE PLAN

FILENAME: ASPHALT54

BASE SCALE: NONE



Does NOT contain Unclassified Controlled Nuclear Information

Reviewing Official: JA Brown S-7 DGL 5/14/98
(name/title) (date)

AREA "G" SITE PLAN

SCALE: NONE

[redacted]

FIGURE #2

Environmental Management
Solid Waste Operations

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

SOLID WASTE OPERATIONS
AREA "G" SITE PLAN

TA-54 | BLDG. N/A | RM. N/A

DRWN: S. MADRID | FILE: Asphalt54 | SHEET: 1 OF 1

DSGN: N/A | WO: N/A

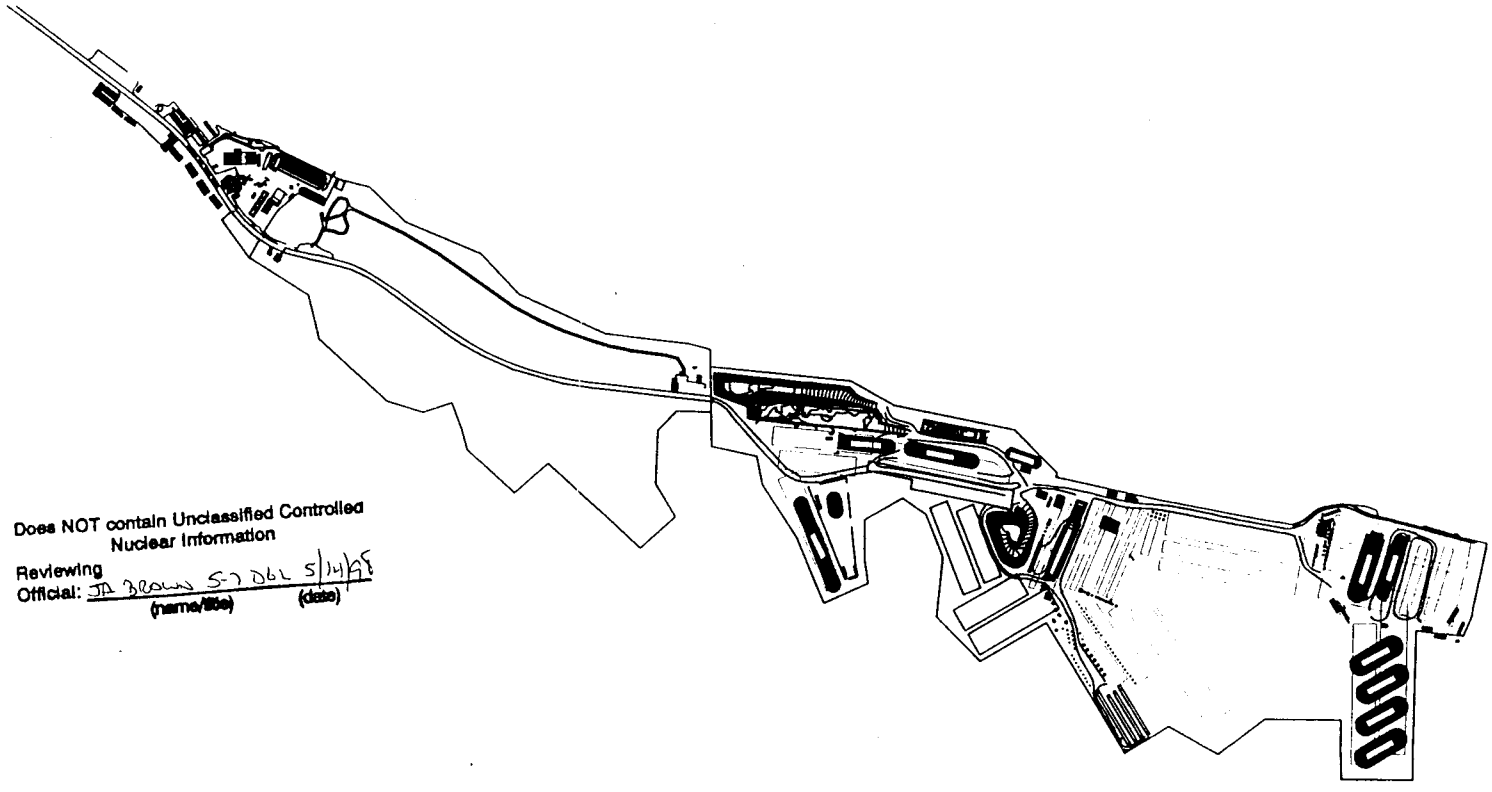
CHKD: SEAN FRENCH | C#: FMU64-SK4a

DATE: 3-19-1998 | PI: N/A

SK4a

FILENAME: ASPHALT54

BASE SCALE: NONE



Does NOT contain Unclassified Controlled Nuclear Information

Reviewing Official: JA Brown S-7 DGL 5/14/98
(name/title) (date)

TA-54 SITE PLAN

SCALE: NONE

[redacted]

FIGURE #1

N

Environmental Management
Solid Waste Operations

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

SOLID WASTE OPERATIONS
TA-54 SITE PLAN

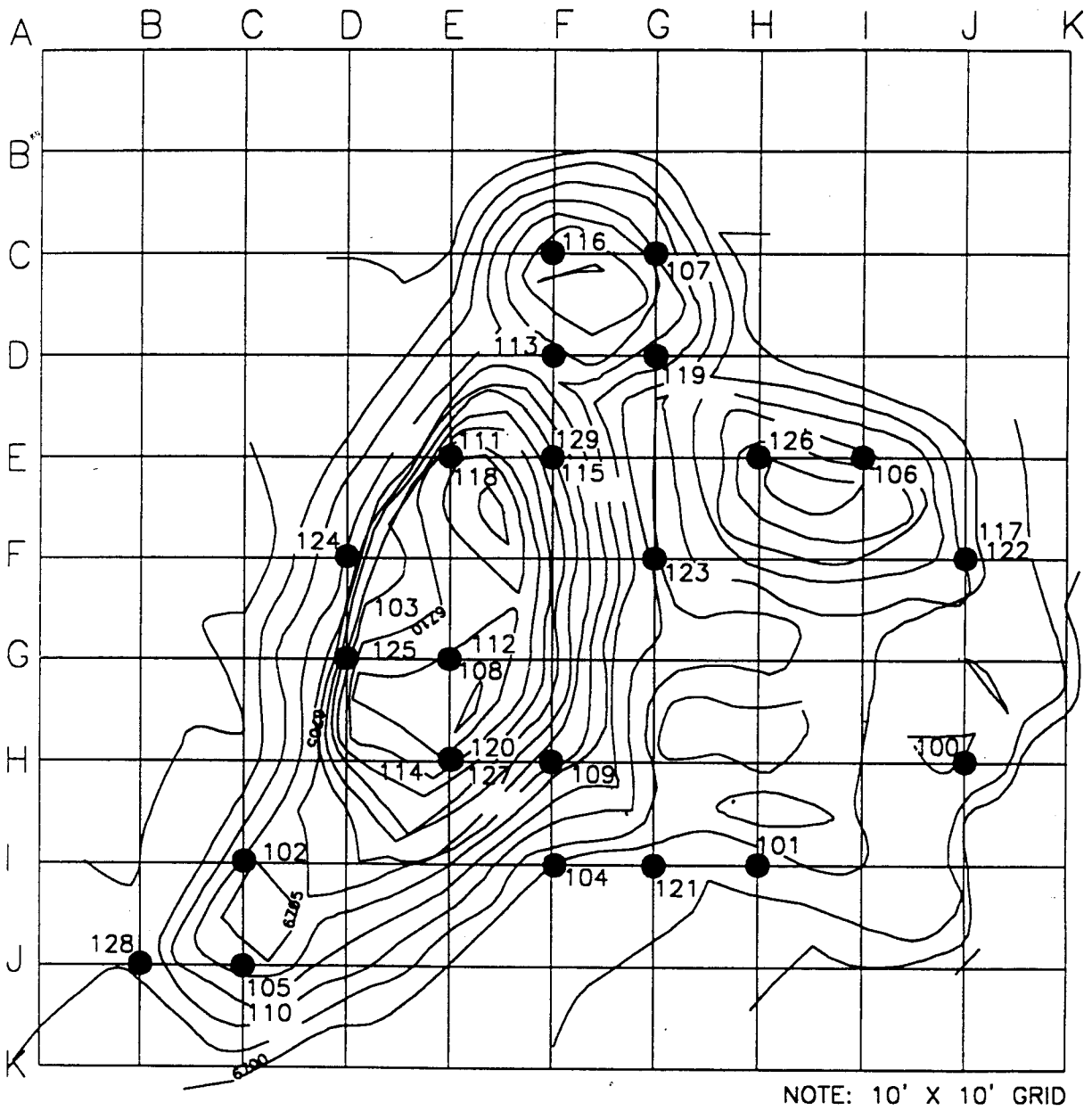
TA-54 | BLDG: N/A | RM: N/A
DRWN: S. MADRID | FILE: Asphalt54 | SHEET: 1 OF 1
DSGN: N/A | WO: N/A
CHKD: SEAN FRENCH | C#: FMU64-SK4
DATE: 3-19-1998 | PI: N/A

SK4

FIGURE 2: AREA "G" SITE PLAN

FIGURE 3: AREA "G" ASPHALT/SOIL (NEAR BLDG. 281)

Environmental Management Solid Waste Operations	SOLID WASTE OPERATIONS AREA "G" ASPHALT/SOIL NEAR BLDG.281		
FMU-64 EM-SWO	TA-54	BLDG. N/A	ROOM N/A
Los Alamos — Los Alamos National Laboratory, Los Alamos, New Mexico 87545	DRWN S. MADRID	FILE AsphaltGr2	SHEET SK2
	DSGN N/A	WO N/A	
	CHKD SEAN FRENCH	C# FMU64-SK2	
	RLSD SEAN FRENCH	DATE 3-19-1998	



NOTE: 10' X 10' GRID

AREA "G" ASPHALT/SOIL

SCALE: NONE

NEAR BLDG. 281

U[redacted]

FIGURE #3

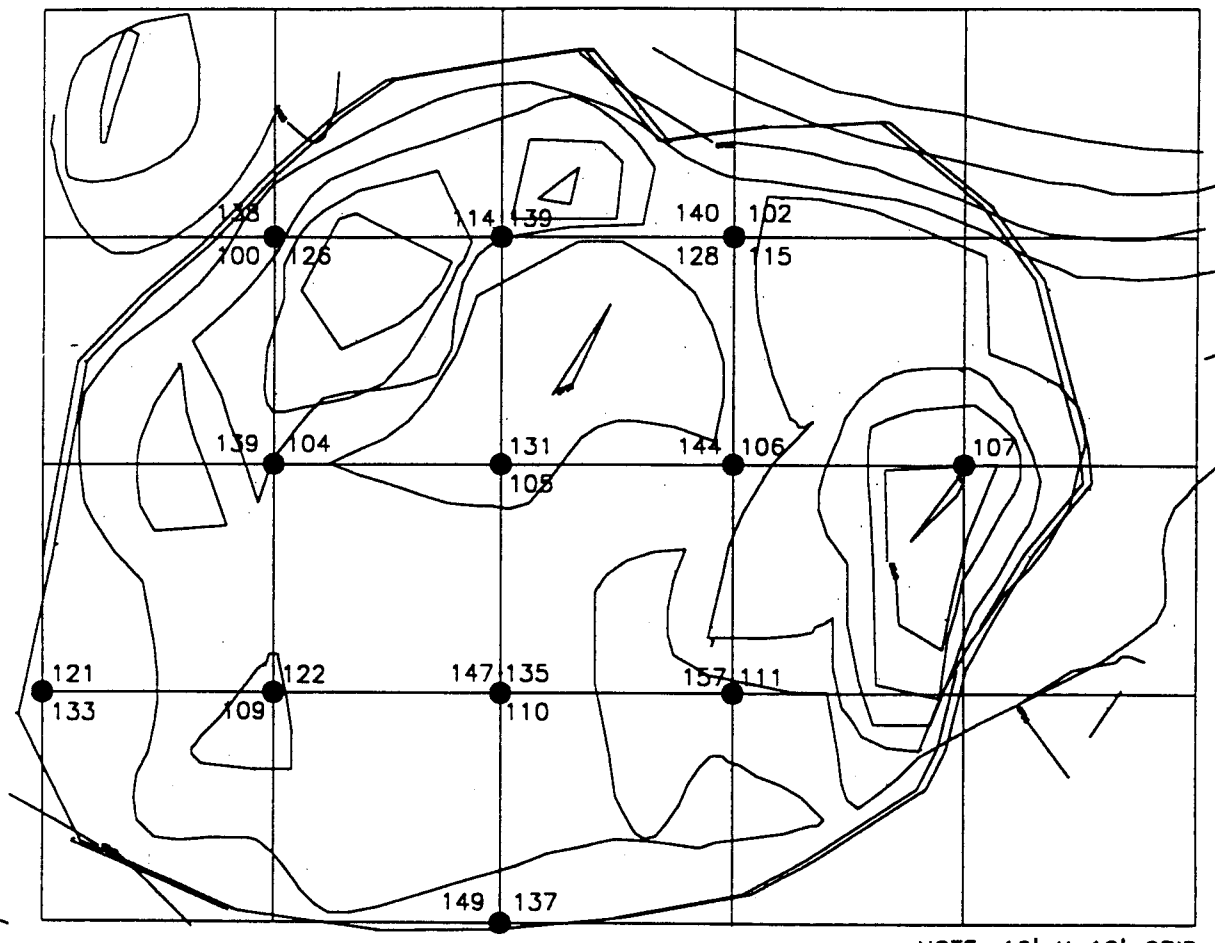
BASE SCALE: NONE
FILENAME: AsphaltGr2

Does NOT contain Unclassified Controlled Nuclear Information

Reviewing Official: JR Brown (name/title) 5-7-96 (date)

FIGURE 4: AREA "G" ASPHALT/SOIL (IN PIT 37)

Environmental Management Solid Waste Operations	SOLID WASTE OPERATIONS AREA "G" ASPHALT/SOIL IN PIT 37			
FMU-64 EM-SWO	TA-54	BLDG. N/A		ROOM N/A
Los Alamos — Los Alamos National Laboratory, Los Alamos, New Mexico 87545	DRWN S. MADRID	FILE PitApht1		SHEET
	DSGN N/A	WO N/A		SK3
	CHKD SEAN FRENCH	C# FMU64-SK3		
	RLSD SEAN FRENCH	DATE 3-19-98		



NOTE: 10' X 10' GRID

Does NOT contain Unclassified Controlled Nuclear Information

Reviewing Official: JA Brown S-7 DGL 5/14/98
(name/title) (date)

AREA "G" ASPHALT/SOIL

SCALE: NONE

IN PIT 37

[redacted]

FIGURE #4

BASE SCALE: NONE
FILENAME: PitApht1

ATTACHMENT 1

SAMPLING AND ANALYSIS PLAN

ASPHALT SAMPLING AND ANALYSIS PLAN

Section

Review and Approval Sheet

1.0 Purpose and Scope
2.0 Roles/Responsibilities
3.0 Sampling (Characterization) Strategy
  3.1 Principal Constituents of Concern
  3.2 Sample Representativeness
4.0 Sampling
  4.1 Sampling Location
  4.2 Sample Numbers
  4.3 QA/QC Samples
  4.4 Sample Packaging and Shipping
5.0 Analytical Methods
6.0 Data Validation
7.0 Sampling Waste Minimization and Waste Management
8.0 Sampling Equipment
9.0 Field Changes and Documentation
10.0 Signatures

ATTACHMENT 1: Sampling Strategy
ATTACHMENT 2: Facility Map
ATTACHMENT 3: ES&H Hazard Screening

FINAL

ASPHALT SAMPLING AND ANALYSIS PLAN

REVIEW AND APPROVAL SHEET

Mary Jane Windr STL (print name) Sean French (STL)	STL signature Sean French	9/22/97 Date 9/23/97
BOB ANDERSON SSO (print name)	SSO signature	9-23-97 Date
GARY HAGERMANN RCT (print name)	RCT signature	9/23/97 Date
KIRK MEEKIN IH (print name)	IH signature	9/23/97 Date
Martha J Mitchell QA (print name)	QA signature	23 Sept 97 Date
Tony Stanford EMSWO Group Leader		9/23/97 Date

1.0 PURPOSE AND SCOPE

This (Sampling and Analysis Plan) SAP is designed to ensure that defensible analytical data is obtained from statistically representative sampling of asphalt/soil materials located at Technical Area (TA)-54, Area G. Analytical data obtained from this sampling effort will indicate the concentration of potential constituents of concern, and be used to support waste management decision making.

Originally, approximately 30 yd^3 of potentially contaminated soil and asphalt were excavated from TA-54, Area L and subsequently piled at Area G. After this transfer, clean material was added and the piles were relocated and thoroughly mixed. Since this relocation, additional clean material has been added to the piles but not mixed. This most recently added material can be distinguished from the original, potentially contaminated material and will be segregated for management as non-hazardous, solid waste prior to characterization activities.

Before the original excavation, preliminary characterization was performed on the asphalt and underlying soil (at TA-54, Area L). This characterization indicated both the soil and the asphalt were contaminated with chloroform, 1,1,1-trichloroethane, trichloroethylene, and perchloroethylene and that the asphalt contained higher concentrations of these constituents.

The asphalt/soil materials currently located approximately 80 feet east of TA-54-281 and the asphalt/soil materials placed in Pit 37 at Area G will both be sampled in accordance with this SAP (See Attachment 2 for location of Pit 37 and asphalt/soil material pile east of TA-54-281). The asphalt/soil materials east of TA-54-281 are arranged in a conical pile with approximate dimensions 53 ft. (length) x 48 ft. (width) x 12 ft. (depth). The approximate volume of this pile is 300 yd^3. Asphalt/soil materials placed in Pit 37 were removed from the pile east of TA-54-281. At this time it is unknown what dimensions the materials in Pit 37 exhibit, however it is known that approximately 225 yd^3 of the asphalt/soil materials were placed in Pit 37. The composition (based on visual inspection of the asphalt/soil pile located east of TA-54-281) of the asphalt/soil materials in both locations is listed below:

- soil: 95%
- asphalt: 5%
- concrete: 1.0%
- wood/vitrified clay pipe: 0.10%

2.0 ROLES/RESPONSIBILITIES

The sampling team leader (STL) prepares a draft of this Plan and distributes it to the Site Safety Officer (SSO), the Radiological Control Technician (RCT), the Industrial Hygienist (IH), and Quality Assurance (QA) officer. After comments from these individuals have been incorporated, the SAP is finalized and signed.

The STL's responsibilities are to:

- complete a draft of the SAP for review and approval,
- revise DRAFT SAP per comments from SSO, RCT, IH, and QA officer
- ensure proper signatures and finalize SAP
- document all revisions to the finalized SAP
- provide safe, retrievable storage of documents promulgated by implementation of this sampling plan.
- coordinate sample location,
- coordinate sample collection personnel,
- coordinate sample packaging and shipment,
- complete a sample number cross-reference table
- maintain and record information in field logbook

The Sampling Team Members' responsibilities are to:

- review and follow this sampling plan, and
- inform the STL of any unusual situations or deviations needed from the SAP

The Independent QA reviewer's responsibilities are to:

- review this SAP, and
- sign the SAP after review and comment
- review analytical data

3.0 SAMPLING (CHARACTERIZATION) STRATEGY

The soil/asphalt materials will be sampled using stratified random grab sampling with soil and asphalt representing the two strata to be considered. Stratified random grab sampling was selected because concentration differences were noted between the soil and asphalt phases in the preliminary characterization.

3.1 Principal Constituents of Concern

Based on preliminary in-place sampling of the asphalt at TA-54, Area L, the only constituents of concern expected to be found in the asphalt/soil materials are volatile organic compounds (VOCs). Although VOCs are the principle constituents of concern, sampling and analysis for semi-volatile organic compounds (SVOCs) and RCRA metals will also be conducted to ensure proper waste characterization and support waste management decisions.

Because asphalt typically contains SVOCs, a comparison between these analytical results and existent analytical data from asphalt unaffected by contaminants from Area L will be performed. However, it should be recognized that asphalt can contain various constituents that may or may not be identical to the asphalt taken from Area L due to weathering and/or matrix composition.

3.2 Sample Representativeness

The sampling strategy defined within this SAP was designed to determine contaminant concentrations which represent the upper bound of the mean with a minimum 90% confidence (see Attachment 1).

4.0 SAMPLING

4.1 Sampling Location

The asphalt/soil material located east of TA-54-281 will be sampled at its current location.

As specified in Attachment 1, sample locations will be identified by:

1. Segregating the known clean material from the soil/asphalt matrix,
2. Establishing a grid over the area with the soil/asphalt matrix,
3. Estimating the depth of the soil/asphalt matrix at each grid location,
4. Assigning consecutive numbers to each grid node based on the depth at the node,
5. Selecting 30 distinct random numbers between 1 and the maximum consecutive number assigned in Step 4, to use as sampling locations,
6. Collecting asphalt samples from the asphalt closest (within 3 feet) to the designated location for the first 14 random points. If no asphalt is present at that point, proceed to the next random point and repeat.
7. Collecting one foot soil samples from the next 6 random points.

~~Due to worker safety issues addressed in the attached ES&H Hazard Screening Questionnaire (Attachment 3), and to ensure statistically representative sampling, the asphalt and associated soil located in Pit 37 will be excavated, and placed adjacent to the excavation prior to sampling. The excavated material will remain within the footprint of Pit 37 during the entire sampling effort, and will be placed on plastic sheeting in an area where other wastes streams in the Pit have been covered with clean fill. This will ensure that the asphalt is not contaminated by other waste streams that have been disposed of in Pit 37.~~

Due to the proximity of other disposed waste in the Pit, asphalt/soil will not be excavated in order to sample. The boundaries (horizontal and vertical) of the disposed asphalt and soil will be established using heavy construction equipment (i.e., a backhoe and/or a bulldozer).

In general, as described in Attachment 1, sample locations will be identified by:

1. Establishing a grid over the area with the soil/asphalt matrix,
2. Estimating the depth of the soil/asphalt matrix at each grid location,
3. Assigning consecutive numbers to each grid node based on the depth at the node,
4. Selecting 30 distinct random numbers between 1 and the maximum consecutive number assigned in Step 4, to use as sampling locations,
5. Collecting asphalt samples from the asphalt closest (within 3 feet) to the designated location for the first 12 random points. If no asphalt is present at that point, proceed to the next random point and repeat.

3.2 Sample Representativeness

The sampling strategy defined within this SAP was designed to determine contaminant concentrations which represent the upper bound of the mean with a minimum 90% confidence (see Attachment 1).

4.0 SAMPLING

4.1 Sampling Location

The asphalt/soil material located east of TA-54-281 will be sampled at its current location.

As specified in Attachment 1, sample locations will be identified by:

1. Segregating the known clean material from the soil/asphalt matrix,
2. Establishing a grid over the area with the soil/asphalt matrix,
3. Estimating the depth of the soil/asphalt matrix at each grid location,
4. Assigning consecutive numbers to each grid node based on the depth at the node,
5. Selecting 30 distinct random numbers between 1 and the maximum consecutive number assigned in Step 4, to use as sampling locations,
6. Collecting asphalt samples from the asphalt closest (within 3 feet) to the designated location for ~~the first~~ 14 of the 30 random points. If no asphalt is present at that point, proceed to the next random point and repeat.
7. Collecting one foot soil samples from ~~the next~~ 6 of the 30 random points. ~~Asphalt~~ Asphalt and soil samples shall be collected from separate locations.

SF 9/29/97 MOW 9/29/97

Due to worker safety issues addressed in the attached ES&H Hazard Screening Questionnaire (Attachment 3), and to ensure statistically representative sampling, the asphalt and associated soil located in Pit 37 will be excavated, and placed adjacent to the excavation prior to sampling. The excavated material will remain within the footprint of Pit 37 during the entire sampling effort, and will be placed on plastic sheeting in an area where other wastes streams in the Pit have been covered with clean fill. This will ensure that the asphalt is not contaminated by other waste streams that have been disposed of in Pit 37.

In general, as described in Attachment 1, sample locations will be identified by:

1. Establishing a grid over the area with the soil/asphalt matrix,
2. Estimating the depth of the soil/asphalt matrix at each grid location,
3. Assigning consecutive numbers to each grid node based on the depth at the node,
4. Selecting 30 distinct random numbers between 1 and the maximum consecutive number assigned in Step 4, to use as sampling locations,
5. Collecting asphalt samples from the asphalt closest (within 3 feet) to the designated location for ~~the first~~ 12 of the 17 random points. If no asphalt is present at that point, proceed to the next random point and repeat.
6. Collecting one foot soil samples from ~~the next~~ 5 of the 17 random points. Asphalt and soil samples shall be collected from separate locations

SF 9/29/97 MOW 9/29/97

4.2 Sample Numbers

Based on the calculation method given in Gilbert (1987), along with the assumption that the upper bound for the mean will be estimated with 90% confidence, it has been determined that fourteen asphalt samples and six soil samples will be required from the material located east of TA-54-281 to attain the confidence level specified in Section 3.2. Computations were performed based on perchloroethylene concentrations because this compound exhibited the highest concentrations in the preliminary sampling and has the largest cancer risk coefficient for ingestion exposure pathways. It is estimated that twelve asphalt and five soil samples will be collected from the material currently located in Pit 37. The total number of samples from the asphalt/soil materials currently located in Pit 37 may be adjusted after the material has been excavated.

4.3 QA/QC Samples

One trip blank will be analyzed for each sampling day. One set of duplicate samples, equipment blanks, and field blanks will be collected and analyzed for every twenty waste samples , or subset thereof. (i.e. if one to twenty samples are collected, one set of QA/QC samples will be collect; if twenty-one to 40 samples are collected, two sets of QA/QC samples will be collected.)

4.4 Sample Packaging and Shipping

Sample packaging will be performed in accordance with Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846). Prior to release from MDA G (a radiologically controlled area), sample containers will be swiped to ensure no radioactive surface contamination. All samples will be placed in coolers and transported by authorized personnel to TA-59. There, they are screened by the "Rad Van" to determine DOT requirements for shipment before being accepted by Sample Management at CST-3 for re-labeling and shipment. The following is the document trail for sample Chain of Custody:

1. STL originates the Sample Chain of Custody and relinquishes samples to sample transport personnel for transfer to the "Rad Van"
2. Sample transport personnel relinquish samples to "Rad Van" personnel for DOT screening.
3. "Rad Van" personnel relinquish samples to sample transport personnel for transport to the Sample Receiving Facility at TA-59 for re-labeling and shipment to an off-site analytical laboratory.

The Sample Receiving Facility at TA-59 then originates the CST-3 Chain of Custody Form and ships the samples to an off-site analytical laboratory under chain of custody for analysis.

Analytical Laboratory: An external analytical laboratory, Barringer Laboratories Inc., will provide analytical services. Barringer Laboratories Inc. has an internal chain of custody procedure and documentation. Excess sample volumes will be returned to FMU-64 using the analytical laboratory's chain of custody form.

5.0 ANALYTICAL METHODS

Each soil and asphalt sample, including duplicates, will be analyzed for VOCs, SVOCs, RCRA metals, and gamma spectroscopy. Each of the field blanks, and equipment blanks will be analyzed for VOCs, SVOCs, and RCRA metals. Each trip blank will be analyzed for VOCs. No head space will be present in any of the VOC sample containers. Table one lists the SW846 methods, containers, and preservative requirements for each analysis that will be requested.

TABLE 1

amber or clear glass allowed per Barringer Laboratory. SF 9/26/ MD 9/26

Analysis Requested	Matrix	SW846 Method	Container	Preservative Requirements
Volatile Organic	Asphalt/soil	8260	(2)125 ml amber with Teflon cap	4° C
Semi-volatile Organic	Asphalt/soil	8270	250 ml amber with Teflon cap	4° C
Inorganic (TCLP)	Asphalt/soil	1311/6010/7470	250 grams plastic or glass	None
Volatile Organic	Water	8260	(2)40 ml amber	4° C with HCL to pH of <2
Semi-volatile Organic	Water	8270	(2)1 L amber with Teflon cap	4° C
Inorganic (TCLP)	Water	1311/6010/7470	1 liter glass or plastic	4° C

6.0 DATA VALIDATION

Review of the laboratory reported organic and inorganic data will be made using criteria derived from the EPA Contract Laboratory Procedure (CLP) Functional Guidelines. No similar criteria have been promulgated by EPA for radiochemical data validation but the review of radiochemical data utilizes criteria derived from the model of CLP Functional Guidelines. In the implementation of the above criteria there are three levels or gradations of review; Levels 1, 2, and 3.

Level 1 generally involves checking primary quality control measures whereas Level 3 builds on the Level 1 and 2 review but also with aspects of the raw data supporting data. Typically a Level 3 review is only done if the Level 1 or 2 review suggests the potential for problems in the reported results.

For this project, a Level 2 review of data will be conducted unless a Level 3 review is indicated.

7.0 SAMPLING WASTE MINIMIZATION & WASTE MANAGEMENT

SF, 9/23/97

Waste generated during the sampling effort will be placed in drums and segregated as stated below. Containers with potentially hazardous waste will be stored in RCRA permitted or interim status storage facilities. In order to minimize the volume of potentially hazardous, radioactive, or mixed waste generated during the operation, sample equipment and sample bottle packaging will be removed outside the radiologically controlled area and disposed as non-regulated solid waste.

PPE (or other items) that never came into contact with asphalt/soil materials will be placed in a container labeled as "Non-Regulated" waste.

PPE (or other items) known to have contacted asphalt/soil materials or, suspected of being contaminated via contact with asphalt/soil materials, will be placed in a container labeled as hazardous waste pending analysis.

Decontamination fluids will be packaged in containers labeled as hazardous waste pending analysis

Sampling Waste: Reusable sampling equipment will be decontaminated for reuse. Disposable waste such as kimwipes will be bagged with the contaminated PPE and placed in the waste container labeled as hazardous waste pending analysis.

Returned Samples: Excess sample volumes returned from the analytical laboratory will be stored and managed as hazardous waste unless analytical data proves otherwise. Returned sample volumes will be containerized and disposed in the same manner as the asphalt/soil materials.

While it is not expected that PPE, decontamination fluids, or sampling waste will be hazardous waste, a determination of the regulatory status of these materials will be made based upon analytical data received from the asphalt and soil samples. Drums containing these materials will be labeled as "hazardous waste pending analysis" to ensure that they will be managed in the most protective manner available. However, re-labeling may occur following receipt of analytical data.

8.0 SAMPLING EQUIPMENT

The asphalt will be sampled with grain thieves if possible. A backhoe or front end loader may be necessary to access the interior of the pile. The heavy equipment will excavate to no less than six inches from sampling location, and a decontaminated shovel will be used to expose the exact sampling location to ensure sample integrity. Sample scoops will be used in locations where the use of a grain thief is not possible. Reusable sampling equipment will be decontaminated in the following order:

- alconox and tap water mixture wash,
- deionized water rinse,
- ~~methanol solution~~ IPA SF 10/8/97 rinse, SF, 9/23/97
- air dry

- final deionized water rinse.
- air dry

Sampling equipment will be decontaminated prior to each use.

9.0 FIELD CHANGES AND DOCUMENTATION

Deviation from procedure as specified in this SAP may be made in the field provided: 1) prior concurrence is attained from the STL, 2) changes are documented in the body of the procedure (or attached to it) prior to continuing sampling operations, 3) and all parties whose signatures appear in Section 10 also initial the changes prior to continuing sampling operations (to verify that they are aware of the changes).The spaces provided below should be used to document field changes. Use additional sheets as necessary to document SAP changes, and ensure that all information required in the spaces below is included. Attach sheets to the final SAP.

The STL will maintain a controlled field logbook which will be used to record notes on all steps of the sampling effort. At a minimum, the STL will record sample numbers, sample locations, weather conditions, time and date, sample team member, and analysis requested.

SAP SECTION	CHANGE DESCRIPTION (Include cause and justification)	DATE	INITIALS
9.C	Isopropyl alcohol will be used for decon, rather than methanol. IPA use will allow	10/8/97	SF RA
	decon materials to be disposed as non-HW as appropriate		
4.1	Asphalt/soil will be sampled in place in Pit 37. See attached redline/strike-out	11/10/97	SF RA JW
	of page 6.		

10.0 SIGNATURES

Prior to commencing work, the following signatures are required.

Sampling Team Leader (*Print Name*) Sean French	Signature Sean French	Group ESH-19	Date 9/29/97
Sampling Personnel (*Print Name*) Renee Archuleta	Signature Renee Archuleta	Group EM-SWO	Date 9/29/97
Sampling Personnel (*Print Name*) Mary Jane Wine	Signature Mary Jane Wine	Group EMSWO	Date 11/3/97
Sampling Personnel (*Print Name*) Raymond Walker	Signature Raymond Walker	Group EM-SWO	Date 11/3/97
Sampling Personnel (*Print Name*) Steve V. Holmes	Signature Steve V. Holmes	Group EM-SWO	Date 11-19-97
(*Print Name*) Martha J Mitchell QA	Signature Martha J Mitchell	Group EM-SWO	Date 9/29/97
(*Print Name*) FRANK PRIMOZIC QA	Signature Frank Primozic	Group EM-SWO	Date 9/29/97

References

Richard O. Gilbert. 1987. *Statistical Methods for Environmental Pollution Monitoring*. Van Nostrand Reinhold: New York, 320 p.

ATTACHMENT 1: SAMPLING STRATEGY

Background

It is necessary to characterize a soil/asphalt pile at TA-54, Area G to determine the concentration of specific volatile organic compounds to support waste management and environmental restoration decision making. This document specifies the number of samples to be collected and a method for determiniing specific sampling locations. Implementing this plan should result in an unbiased estimate of the mean and uncertainty of the concentration of organic compounds in the soil/asphalt material. It is assumed throughout this analysis that the concentrations are normally distributed.

Originally, contaminated soil and asphalt were excavated from TA-54, Area L and subsequently piled at Area G. After this transfer additional clean material was added and the piles were relocated and thoroughly mixed. Since this relocation, additional clean material has been added to the piles but not mixed. This most recently added material can be distinguished from the original contaminated material and should be segregated for management as solid waste prior to characterization activities.

Before the original excavation, preliminary characterization was performed on the asphalt and underlying soil. This characterization indicated both the soil and the asphalt were contaminated with chloroform, 1,1,1-trichloroethane, trichloroethylene, and perchloroethylene and that the asphalt contained systematically higher concentrations of these constituents.

Sampling Approach

The soil/asphalt pile should be characterized by stratified random sampling with soil and asphalt representing the two strata to be considered. Stratified random sampling was selected because systematic concentration differences were noted between the soil and asphalt phases in the preliminary characterization.

In stratified random sampling, the number of samples to be collected may be based on cost or on a prespecified level of error that is acceptable. For a total cost of $20,000, 20 samples can be collected where the cost per sample is $1,000. Assuming an acceptable level of error of 75% of the mean in estimating the mean concentrations of constituents, the required number of samples is approximately equivalent to the cost approach (21). The calculation method is given in Gilbert (1987) and assumes that the upper bound for the mean will be estimated with 90% confidence. Ideally, risk analysis based on the preliminary sampling results would indicate an acceptable level of error to achieve in the characterization. Such an analysis is not currently available to refine the acceptable error level of 75% of the mean concentration.

The number of samples based on total cost was computed using the formula from Gilbert,

$$n = \frac{C \sum_{h=1}^{L} (W_h \, s_h / \sqrt{c_h})}{\sum_{h=1}^{L} (W_h \, s \sqrt{c_h})}$$

where

n is the total number of samples to be collected,

C is the total cost allocated for sampling $20,000,

W_h is the proportion of material in stratum h (0.95 for soil and 0.05 for asphalt),

s_h is the sample standard deviation for stratum h from the preliminary sampling,

c_h is the cost per sample $1,000, and

L is the number of strata (2) (Gilbert 1987).

The number of samples based on acceptable error was determined using the following formula derived from Gilbert (1987),

$$n = t_{.90,n-2} \sum_{h=1}^{L} W_h s_h^{\,2} / d^2$$

where

d is the acceptable error (75% of the mean concentration in the soil/asphalt mixture)

$t_{.90,n-2}$ is the 90th percentile for a t distribution with n-2 degrees of freedom

and all other terms are defined previously.

Proportional allocation of the total required number of samples was used to determine the number to be collected from each strata, soil and asphalt. This computation was performed using the formula from Gilbert,

$$n_h = \frac{n W_h \sigma_h}{\sum_{h=1}^{L} W_h \sigma_h}$$

where

n_h is the number of samples to be collected in stratum h,

σ_h is the standard deviation in stratum h, approximated by s_h, the sample standard deviation, from the preliminary sampling,

and all other terms are defined previously (Gilbert 1987).

Substituting the appropriate values resulted in fourteen samples from asphalt and six samples from soil. The method for identifying random sampling locations is described in the procedural steps below.

Procedure for identifying sampling locations:

1. Segregate known clean material from contaminated material.
2. Establish an origin at the southwest corner of the contaminated area.
3. Select two random numbers between 0 and 10 and offset the origin to the south and west by the selected random number of feet.
4. Using appropriate survey tools, establish a 10 x 10 grid over the contaminated area.
5. Designate each grid node in the contaminated soil alphabetically starting as AA, AB, ..., BA, BB, ... CA, etc.
6. Estimate the depth of the soil/asphalt matrix at each grid location to the nearest foot and record with the alphabetic grid node designation.
7. Assign consecutive numbers to each grid node based on the depth at the node. For example, if node AA has a depth of 3 feet assign numbers 1, 2, and 3, and AB has a depth of 5 feet assign numbers 4, 5, 6, 7, and 8. Continue this assignment process until all depths at all grid nodes in the contaminated area have been assigned consecutive numbers.
8. Select 25 distinct random numbers between 1 and the maximum consecutive number assigned in Step 7 using a random number generator found in spreadsheet software or other source. Thirty numbers will be generated instead of 20 to allow for extra points in case some points are not usable because no asphalt is present.
9. These numbers give the sampling locations. Continuing with the example from Step 7, suppose the random number 7 is selected, this indicates that a sample should be collected at grid node AB at a depth 3-4 feet below the surface because 7 corresponds to the fourth consecutive number at that location; the depth to be sampled is determined by the sequence of the numbers assigned to the grid node, the first number is 0-1 feet, the second 1-2 feet, the third 2-3 and so on.
10. Collect asphalt samples from the asphalt closest (within 3 feet) to the designated location for the first 14 random points. If no asphalt is present at that point, proceed to the next random point and try again.
11. Collect one foot soil samples from the next 6 random points.

Data Reduction

Following sample analysis, the mean and variance for the overall mixture will be used to determine a 90% upper confidence limit for the mean. Compute the mean concentration and variance for the soil/asphalt mixture using

$$x_{st} = \sum_{h=1}^{L} W_h x_h$$

and

$$s^2(x_{st}) = \sum_{h=1}^{L} \frac{W_h^2 s_h^2}{n_h}$$

where

x_{st} is the mean concentration in the soil/asphalt mixture,

x_h is the mean concentration in stratum h,

$s^2(x_{st})$ is the variance of the concentration in the soil/asphalt mixture, and

s_h is the standard deviation in stratum h.

Then, the 90% upper confidence limit, UCL_{90}, is computed using

$$UCL_{90} = x_{st} + \frac{t_{.90,n-2}\, s(x_{st})}{\sqrt{n}}$$

where

$t_{.90,n-2}$ is the 90th percentile for a t distribution with n-2 degrees of freedom

n is the total number of samples collected.

References

Richard O. Gilbert. 1987. *Statistical Methods for Environmental Pollution Monitoring*. Van Nostrand Reinhold: New York, 320 p.

ATTACHMENT 2: FACILITY MAP

FINAL

ASPHALT SAMPLING AND ANALYSIS PLAN

ATTACHMENT 3: ES&H HAZARD SCREENING

G-02

ES&H Hazard Screening

Instructions: An authorized person, designated by the facility manager (FM), is responsible for initial identification of environment, safety and health (ES&H) hazards associated with this work request. Refer to LIG XXXX, *Guidance for Hazard Analysis and Control*, for specific hazards associated with the hazard catagories below. If the work involves new construction projects, modified construction plans, or new or modified programs or processes, the ESH-ID process should be considered.

Work Request Number	Originator Name			Originator Z Number
	MARY JANE WINCH			
Facility Management Unit: FMU 64	Technical area: 54	Building	Room	Other: Area G PIT ~~35~~ 37

Work Description:
SAMPLE ASPHALT IN PIT 37 AND BACKFILL [redacted] PILE EAST OF 281

Environmental Impacts: Does the work involve...			
Watercourses (e.g., potential disturbance of a river, creek, arroyo, canyon, draw, or wash)	(NO)	YES	Don't Know
Emissions or Discharges (e.g. production, or new or modified air emissions or water discharges to the environment)	(NO)	YES	Don't Know
Existing waste streams (e.g., changes to existing waste streams)	(NO)	YES	Don't Know
New waste (e.g., generation of hazardous waste)	NO	(YES)	Don't Know
Worker Hazards: Does the work involve...			
Ionizing Radiation (e.g., handling radioactive material, entry into posted radiological areas, working with or near radiation-producing devices)	NO	(YES)	Don't Know
Worker Exposure (e.g., working with or potential exposure to nonionizing radiation, noise, chemicals, hazardous biological materials, lead, asbestos, temperature/ humidity extremes)	NO	(YES)	Don't Know
Energized/Operative Systems (e.g., working on or near energized electrical systems or explosive materials or working on or with gas, water, steam, waste -line other than sewer-line, pressure, or cryogen systems; unprotected belts, pulleys, chains, or rotating equipment; or fuel-fired equipment other than vehicles)	(NO)	YES	Don't Know
Confined Spaces (e.g., entry into tanks, manholes, cooling towers, sumps)	(NO) BA	~~YES~~	Don't Know
* **Excavations or Penetrations** (e.g., indoor or outdoor excavation; soil disturbance; or ceiling, floor, wall, or roof penetration)	(NO) BA	~~YES~~	Don't Know
Material Handling/Heavy Equipment (e.g., working with or near operating cranes, hoists, rigging equipment, forklifts, or heavy equipment including bulldozers, backhoes, or drill rigs)	NO	(YES)	Don't Know
Elevated Work Surfaces (e.g., platforms, roofs, or unprotected raised structures above six feet)	(NO)	YES	Don't Know
Other (Describe)	(NO)	YES	Don't Know

Special Training, Escorts, or Access Requirements (describe)
PHA/AHA, Site AHA, Site Safety Briefing Required
Contact FMU-64 Rad Control Tec Prior to entry RWP Required - work stop required if measurable con detected in ac with RWP.

Note: If any answers to the questions above are *Yes* or *Don't Know*, Form XXXX, *ES&H Hazard Controls*, must be completed by qualified personnel. Assistance from institutional ESH personnel is available as needed.

If all answers to the questions above are *No*, work may proceed upon authorization by the FM or designee.

BA 8-4

Signature Mary Jane Winch

Authorized Person Dick Johnson / N/A Date
Name Signature

* Determined not to be an excavation but rather a routine movement of already excavated fill and cover material.

G-02

ES&H Hazard Controls

Instructions: Qualified personnel (as defined in LIR XXX, Hazard Analysis and Controls) are responsible for detailed identification of ES&H hazard controls associated with this work request. Institutional ESH personnel are available to assist in this detailed screening

Work Request Number	Hazard Present? YES NO	Existing Controls? List below or attach	Existing controls adequate? YES NO	Additional Controls Needed? List below or attach.	Who Supplies? a) Originator b) Work Provider c) FMU
Environmental Impacts	NO				
Watercourse or water discharge	no	Contact ESH-18 at 5-1859			
Air emissions	no	Contact ESH-18 at 5-1859			
Change to existing waste streams	no	Contact ESH-18 at 5-1859			
Generation of new waste	yes	Contact ESH-18 at 5-1859	yes		WP
Other	~~no~~	LIR-00-03.0			
Ionizing Radiation	no				
Handling radioactive material	NO				
Entry into posted radiological area <25 mrem/yr	YES	ALARA-FMU-64-006	YES		
Radiation area	YES	ALARA-FMU-64-006	NO	RCT contact Required	
High radiation area	no				
Very high radiation area	no				
Contamination area	no				
High Contamination area	no				
Airborne radioactivity area	no				
Working with radioactive source	no				
Working with or near radiation-producing device	no				
other	no				
Worker Exposures	no				
Laser	no				
Sub-radio-frequency electric or magnetic	no				
field	no				
Radio-frequency/microwave radiation	no				
Elevated level of infrared, visible, or	no				
ultraviolet radiation	no				
High noise level	no				
Airborne exposure to or direct contact with	no				
Asbestos or asbestos-containing material	no				
Beryllium	no				
Carcinogen	no				
Corrosive	no				
Lead	no				
Epoxy	no				
Ether or other peroxide-forming material	no				
Reactive metal	no				
Refractory ceramic fiber	no				
Highly toxic or controlled substance	no				
Cryogen	no				
Compressed gas	no				
Flammable/combustible material	no				
Live animal, animal or human tissue,	no				
blood or excreta	no				
Bacterial or viral material	no				
Temperature/humidity extreme	no				
other	NO				

G-02	Hazard Present? YES NO	Existing Controls? List below or attach	Existing controls adequate? YES NO	Additional Controls Needed? List below or attach.	Who Supplies? a) Originator b) Work Provider c) FMU
Energized/Operating Systems	NO				
Working on or near					
Energized electrical systems					
Explosive material					
Working on or with					
Gas system					
Hydraulic System					
Steam system					
Utility water line					
Waste line					
Pressure or cryogen system					
Power-driven belt, pully, chain or					
rotating equipment					
Fueled fired equipment other than vehicle					
Other					
Confined Spaces					
Posted limited egress or confined space					
Hazardous atmosphere					
Engulfment					
Other					
Excavations or Penetrations					
Indoor or outdoor excavation	YES				
Trenching, soil removal, or fill					
Blind penetration into wall, floor, ceiling,					
or roof					
Other					
Material-Handling/Heavy Equipment					
Crane, hoist					
Rigging or lifting equipment					
Forklift, fork attachment					
Hydraulic lift or jack	no				
Drill rig, backhoe, or dozer	YES	QUALIFIED OPERATOR	YES		WP
Other	no				
Elevated Work Surfaces Ladders					
Scaffolding					
Manlift or aerial lift					
Platform, roof, or unprotected raised structure					
Other	NO				

Note: New and/or required controls must be supplied as indicated in the last column before work begins, unless otherwise agreed to by the contract administrator, FMU representative, or work provider.

Signatures

Signatures indicate concurrence with hazard identification and controls

Authorized Person Dick Johnson (Name) / N/A (Signature) Date

Qualified Person Bob Anderson (Name) / Bob Anderson (Signature) Date 8-1-97

IH I.H. REVIEW REQUIRED ON SWP

IS

RAD

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RADIOLOGICAL WORK PERMIT

ESH-1 USE ONLY	
Permit Number 17-54-G-164	
Effective Date 8/26/97	Expiration Date 8/26/98

GENERAL INFORMATION (to be completed by requester)

Requested by: (Printed name, signature)	Group	Phone No.	Mail Stop	Work Location (TA, Bldg, Room No.)
Mary Jane Winch	EM-SWO	25905	J595	54; Pit 37 + East 281

SOP No.	Small Job Ticket No.	Work Order No.	Requested Start Date	Expected End Date
N/A	N/A	N/A	8/25/97	2/25/97

Work to be performed (add attachment if necessary) ES&H review needed? Y ☐ N ☐ ☐ ES&H review attached

~~Excavate~~ REMOVE soil/asphalt from pit 37. Survey excavated material. Sample ~~excavated~~ removed material. Sample soil/asphalt east of Bldg ~~278~~ 281. Sampling will involve use of backhoe and/or front end loader

PRE-JOB RADIOLOGICAL CONDITIONS (to be completed by RCT/HPT)

■ Anticipated radiological conditions (enter anticipated conditions if survey cannot be performed before work begins) or

☐ Measured radiological conditions (Record all readings as highest/general area.) ☐ See attached map

Surface Contamination (dpm/100 cm²)

	Direct	Smear	LAS (large area swipe)
Alpha	<MDA / <MDA	<MDA / <MDA	N/A / N/A
Beta/gamma	<MDA / <MDA	<MDA / <MDA	N/A / N/A
Tritium		N/A / N/A	

External Dose Rate (mrem/hr in work area)

Beta + gamma	<0.1 / <0.1
Neutron	N/A / N/A
Total (β + γ + η)	<0.1 / <0.1

Identify anticipated radionuclides: Pu-239, Am-241

Airborne Radioactivity <0.1 DAC Pu-239 Isotope ■ Anticipated or ☐ Measured

Identify any contamination under paint or on inaccessible surfaces:

PUNCTURING A BURIED CONTAINER COULD RESULT IN CONTAMINATION SPREAD.

Completed by RCT/HPT (printed name)	Signature	Z Number	Date
GARY HAGERMANN	[signature]	114272	8/21/97

ALARA/RADIOLOGICAL PROTECTION REQUIREMENTS (to be completed by RCT)

Protective Clothing Requirements ☐ None ☐ Level I (Coveralls, 2 pair surgeon's gloves, and booties) ☐ Level II (2 Coveralls, 2 pair surgeon's gloves, 2 pair booties)

☐ Lab coat ☐ Skull cap ☐ Hood ☐ Taped openings

■ Gloves (LEATHER) For Pit 37 ☐ Booties ■ Other: FACILITY COVERALLS OR EQUIVALENT FOR PIT 37.

Respiratory Requirements ■ None ☐ ESH-5 respirator card ☐ Supplied air mask* ☐ SCBA*

☐ Full-face respirator ☐ Ventilation ☐ Combination cartridge* ☐ Supplied air suit*

☐ Particulate cartridge ☐ Job-specific air monitoring ☐ Chemical cartridge* *Requires ESH-5/JSFT (JCI) approval

☐ Other: _____

Dosimetry Requirements ☐ None ■ WB dosimeter ☐ Supplemental dosimeter ☐ Alarming dosimeter

☐ TLD finger rings ☐ Special neutron dosimetry ☐ PNAD packet ☐ Pu access list ☐ Nasal swipes

☐ Special unnalysis ☐ Whole-body count ☐ Other: _____

Monitoring Requirements ☐ None ■ Notify RCT before job starts @ 5-6155 ☐ Notify RCT at job end

■ Intermittent coverage ☐ Personnel before leaving job ☐ Equipment and tools before removal ☐ Self-frisking

☐ Continuous coverage ☐ RCT monitor doffing of anti-Cs ☐ Other: _____

Training Requirements ☐ RW I ■ RW II ☐ Other: _____

Additional ALARA Requirements ■ None ☐ ALARA pre-job briefing* ☐ ALARA review (see attachment)*

Trigger levels for **ALARA pre-job briefing** (attach the ALARA pre-job briefing summary)*

a. estimated > 100 mrem individual or > 500 mrem collective dose per work activity
b. potential exposure to airborne radioactivity > 40 DAC-hr
c. removable contamination > 100 times Table 2-2
d. entry into areas > 500 mrem/hr
e. potential for nonroutine radioactive release to the environment

Trigger levels for **ALARA review** (attach the applicable formal ALARA review documentation)*

a. estimated > 500 mrem individual or > 5,000 mrem collective dose per work activity
b. actual or predicted airborne radioactivity concentrations > 100 DAC
c. removable contamination > 1,000 times Table 2-2
d. entry into areas > 10 rem/hr
e. potential for nonroutine radioactive release > 1 DCG to the environment

Refer to LP107-09.0, "ALARA Reviews of Radiological Jobs."

Completed by RCT (printed name)	Signature	Z Number	Date
GARY HAGERMANN	[signature]	114272	8/25/97

HOLD POINTS/SPECIAL INSTRUCTIONS (to be completed by RCT)

Hold Points or Special Instructions:

NOTIFY RCT IF BREECH IN WASTE CONTAINER OCCURRS.
HAND: ALL PERSONEL WILL PERFORM HAND + FOOT FRISKS
UPON EXITING PIT 37

Completed by RCT (printed name)	Signature	Z Number	Date
GARY HAGERMANN	[signature]	114272	8/25/97

APPROVALS

		Signature	Z Number	Group	Date
1	Line manager: BOB ANDERSON	[signature]	080303	EMSWD	8-26-97
2	RCT supervisor: BRIAN SCOTT	[signature]	116204	ESH-4	8/26/97
3	Other (job title/printed name): MARY FAE WINCH	[signature]	114734	EMSWD	8/26/97
4	Other (job title/printed name): E.H. / KICK MCKIN	[signature]	116313	ESH-5	8/26/97

ENV.

POST-JOB RADIOLOGICAL CONDITIONS (to be completed by RCT/HPT)

Measured R :iological Conditions *(Record all readings as highest/general area.)* ❑ **See attached map**

Surface Contamination (dpm/100 cm^2)

	Direct	Smear	LAS (large area swipe)
Alpha	_____/_____	_____/_____	_____/_____
Beta/gamma	_____/_____	_____/_____	_____/_____
Tritium		_____/_____	

External Dose Rate (mrem/hr in work area)

Beta + gamma _____/_____

Neutron _____/_____

Total ($\beta + \gamma + \eta$) _____/_____

Airborne Radioactivity ❑ Estimated or ❑ Measured

_____ DAC _____ Isotope

Survey of Personnel Leaving Job Site

Any personnel contaminated above applicable limits? ❑ Y ❑ N

(If yes, attach the Radiological Incident Report.)

Completed by RCT/HPT *(printed name)*	Signature	Z Number	Date

REVIEW

Associated reports for this job *(indicate the ones that apply)*:

- ❑ CAM results
- ❑ Job-specific air monitoring
- ❑ Pre-job survey data
- ❑ Post-job survey data
- ❑ Finger-ring data
- ❑ Special dosimetry results
- ❑ Nasal swipe data
- ❑ Urinalysis report
- ❑ Whole-body count
- ❑ Wound count
- ❑ Skin contamination
- ❑ Personal clothing survey
- ❑ RWP acknowledgment log
- ❑ Dose tracking report
- ❑ Radiological occurrence/incident report
- ❑ Changes in ALARA/radiological protection requirements
- ❑ ALARA pre-job briefing
- ❑ Formal ALARA review
- ❑ Other: _____

Lessons learned? ❑ Y ❑ N If Yes, then briefly explain. Add attachment if necessary.

Reviewed by RCT *(printed name)*	Signature	Z Number	Date

Reviewed by RCT supervisor *(printed name)*	Signature	Z Number	Date

INSTRUCTIONS FOR COMPLETING THE RWP FORM

General Information (to be completed by requester)

1. Enter your printed name and signature, group number or organization, telephone number, and mail stop.
2. Enter the work location (technical area, building, and room number).
3. Enter any SOP (safe operating procedure), SJT (small job ticket), or WO (work order) number the RWP will support. Enter NA in any blocks that do not apply.
4. Enter the requested start date and the expected end date.
5. Describe the work to be performed. (Add attachment if necessary. Include enough detail for the RCT to determine the extent of survey needed, ALARA/radiological protection requirements, and anticipated changes in radiological conditions.)
6. Complete and attach to the RWP a copy of the SJT ES&H Review or a copy of the ES&H Review Service Request/Supplement.
7. Ensure that the RWP is sent to the appropriate RCT or RCT supervisor.

ESH-1 Use Only (to be completed by RCT/HPT or RCT supervisor)

1. Enter the effective date and expiration date after you have read the GENERAL INFORMATION block.
2. Obtain a permit number from your team or field office and enter it in the top block and inform the team or field office of the effective date and expiration date for the RWP.

INSTRUCTIONS FOR COMPLETING THE RWP FORM (continued)

Pre-Job Radiological Conditions (to be completed by RCT/HPT)

1. Check the box indicating whether the radiological conditions are anticipated or measured. (Conditions inside ducts or pipes typically cannot be measured before breaching those systems. Conditions inside a locked room typically would be measured before work starts in that room.)
2. Indicate whether survey data are shown on an attached map.
3. Enter the survey data to support the RWP. The most recent survey of the area can be used if conditions in that area would remain unchanged. If a survey cannot be performed before the RWP is approved, then estimate the radiological conditions. (A survey must still be performed before the work can start.)
4. Identify radionuclides if possible.
5. Enter data for airborne radioactivity and check box indicating whether data are anticipated or measured.
6. Identify any contamination under paint or on inaccessible surfaces.
7. Mark NA in any blocks that do not apply.
8. Enter your printed name, signature, Z number, and the date.

ALARA/Radiological Protection Requirements (to be completed by RCT)

1. Indicate ALARA/Radiological Protection Requirements by checking the appropriate boxes. Use the requirements and guidance specified in the following documents.
   a. Protective Clothing Requirements: LS107-09.0, "Radiological Protective Clothing" (to be published)
   b. Respiratory Requirements: ESH-1-08-01, "Respiratory Protection"
   c. Dosimetry Requirements: ESH-1-02-10, "External Exposure Control Standard," and ESH-1-06-03, "Issuing And Using Supplemental Dosimetry." Attach a copy of the Dose Tracking Report to the RWP if dose tracking was initiated.
   d. Monitoring Requirements: For low risk jobs, monitoring by an RCT/HPT is not typically needed. For higher risk jobs such as work in respirators and work in High Radiation and/or High Contamination Areas, continuous coverage by an RCT is required. A range of monitoring between these two extremes should be applied for medium risk jobs.
   e. Training Requirements: LS107-02.0, "Radiological Posting," and facility-specific documents
   f. Additional ALARA Requirements: LP107-09.0, "ALARA Reviews of Radiological Jobs." Use the ALARA pre-job briefing trigger levels to determine whether to check the box for None or ALARA pre-job briefing. Use the ALARA review trigger levels to determine if the box for a formal ALARA review should be checked. Attach the ALARA pre-job briefing or the formal ALARA review documentation if any ALARA review trigger levels were met.
2. Enter your printed name, signature, Z number, and the date.

Hold Points/Special Instructions (to be completed by RCT)

1. Indicate any hold points, such as when work must be halted to allow additional surveys or to allow radiological conditions to stabilize.
2. Enter your printed name, signature, Z number, and the date.

Approvals
(to be completed by line manager, RCT supervisor, *and ALARA coordinator, building manager, and/or JCI Safety*)

1. Enter your signature, Z number, group or organization, and the date.

Post-Job Radiological Conditions (to be completed by RCT/HPT)

1. Enter the post-job radiological survey data.
2. Indicate whether survey data are shown on an attached map.
3. Enter data for airborne radioactivity and check box indicating whether data were estimated or measured.
4. Indicate if any personnel were contaminated above applicable limits.
5. Enter your printed name, signature, Z number, and the date.

Review (to be completed by RCT and RCT supervisor)

1. Indicate all associated reports for the RWP by checking the appropriate boxes. (Do not wait to receive the reports before reviewing the RWP.)
2. Indicate if there are "lessons learned" to be conveyed to others. If Yes is checked, briefly explain.
3. Jointly review the RWP for completeness and correctness.
4. Enter your printed name, signature, Z number, and the date.

Los Alamos
NATIONAL LABORATORY

Special Work Permit for Potentially Hazardous Activitie

Requested by	Organization	Issue Date	Expiration Date
Mary Jane Winch	EM-SWO	9-23-97	12-15-97

Location of Work: Tech Area	Building	Room Number
54	Area G	

Work to be Performed

- Remove asphalt waste from Pit 37 (with heavy equipment).
- Survey pile.
- Collect samples (sampling equipment will be deconned with methanol).
- Collect samples from Asphalt pile East of Bldg. 281.

Identified Hazards

- Heavy Equipment
- Methanol
- Airborne Dust (containing silica)

Personnel Assigned

Name	Duties
Carlos Padilla / Tim Martinez	Operate Heavy Equipment
MJ Winch / Sean French	Direct soil removal and sample
Gene Lopez	Surveying

Special Controls

Safety Measures, Precautions, Personal Protective Equipment, Procedures, etc.

- Use water soaking/spraying to suppress silica containing dust during asphalt excavation
- Use 25 mil Nitrile gloves when using methanol to deconn. Review highlighted section of attached MSDS for methanol.

Approvals

	Signature	Date	Organization
Mary Jane Winch (Supervisor)	Mary Jane Winch	9/23	EM-SWO
Rusty Powers (Building Manager)	Rusty Powers	Sept 23, 1997	EM-SWO
I.H./ Kirk Meekin (Other)	Kirk Meekin	9/23/97	ESH-5
Other			

Form 1663 (1-3D) (6/97)

ATTACHMENT 2

RISK SCREENING ANALYSIS

ASPHALT SAMPLING DATA

BARRINGER SAMPLE NUMBER	LANL SAMPLE No.	MATRIX	DATE SAMPLED	DATE ANALYZED	ANALYSIS	CONTAMINANT	CONC.	UNITS	CONV	DATA UALIFIER (a	SAL	RATIO	RELATIVE RISK
200041416	97ASPH1A	asphalt	9/29/97	10/15/97	VOA SOLID	Methylene Chloride	15.0	ug/kg	1.50E-02	B	7.80E+00	(b)	(b)
200041416	97ASPH1A	asphalt	9/29/97	10/15/97	VOA SOLID	Acetone	40.0	ug/kg	4.00E-02	J	2.10E+03	1.90E-05	1.90E-11
200041416	97ASPH1A	asphalt	9/29/97	10/15/97	VOA SOLID	1,1-Dichloroethane	6.9	ug/kg	6.90E-03	~	5.00E+02	1.38E-05	1.38E-11
200041416	97ASPH1A	asphalt	9/29/97	10/15/97	VOA SOLID	2-Butonone	18.0	ug/kg	1.80E-02	J	7.10E+03	2.54E-06	2.54E-12
200041416	97ASPH1A	asphalt	9/29/97	10/15/97	VOA SOLID	1, 1, 1-Trichloroethane	190.0	ug/kg	1.90E-01	~	2.40E+00	7.92E-02	7.92E-08
200041416	97ASPH1A	asphalt	9/29/97	10/15/97	VOA SOLID	Trichloroethene	52.0	ug/kg	5.20E-02	~	3.20E+00	1.63E-02	1.63E-08
200041416	97ASPH1A	asphalt	9/29/97	10/15/97	VOA SOLID	Tetrachloroethene	11.0	ug/kg	1.10E-02	~	5.40E+00	2.04E-03	2.04E-09
200041418	97ASPH1A	asphalt	9/29/97	10/15/97	VOA SOLID	Methylene Chloride	6.0	ug/kg	6.00E-03	B	7.80E+00	(b)	(b)
200041418	97ASPH1A	asphalt	9/29/97	10/15/97	VOA SOLID	Acetone	23.0	ug/kg	2.30E-02	J	2.10E+03	1.10E-05	1.10E-11
200041418	97ASPH1A	asphalt	9/29/97	10/15/97	VOA SOLID	1, 1-Dichloroethane	8.9	ug/kg	8.90E-03	~	5.00E+02	1.78E-05	1.78E-11
200041418	97ASPH1A	asphalt	9/29/97	10/15/97	VOA SOLID	2-Butonone	9.2	ug/kg	9.20E-03	J	~~7.10E+03~~	1.30E-06	1.30E-12
200041418	97ASPH1A	asphalt	9/29/97	10/15/97	VOA SOLID	1, 1, 1-Trichloroethane	220.0	ug/kg	2.20E-01	~	2.40E+00	9.17E-02	9.17E-08
200041418	97ASPH1A	asphalt	9/29/97	10/15/97	VOA SOLID	Trichloroethene	69.0	ug/kg	6.90E-02	~	3.20E+00	2.16E-02	2.16E-08
200041418	97ASPH1A	asphalt	9/29/97	10/15/97	VOA SOLID	Tetrachloroethene	8.9	ug/kg	8.90E-03	~	5.40E+00	1.65E-03	1.65E-09
200041478	97ASPH3	asphalt	1[illegible]/97	11/12/97	RCRA METALS SOLID	Arsenic	1.3	mg/kg	1.3	~	7.82E+00	1.66E-01	1.66E-07
200041478	97ASPH3	asphalt	10/1/97	10/23/97	RCRA METALS SOLID	Barium	47.0	mg/kg	47.0	~	5.30E+03	8.87E-03	8.87E-09
200041478	97ASPH3	asphalt	10/1/97	10/23/97	RCRA METALS SOLID	Chromium	4.5	mg/kg	4.5	~	3.00E+01	1.50E-01	1.50E-07
200041419	97ASPH6A	asphalt	9/29/97	10/15/97	VOA SOLID	Methylene Chloride	8.8	ug/kg	8.80E-03	B	7.80E+00	(b)	(b)
200041420	97ASPH6A	asphalt	9/29/97	10/15/97	VOA SOLID	Methylene Chloride	7.3	ug/kg	7.30E-03	B	7.80E+00	(b)	(b)
200041474	97ASPH8	asphalt	9/29/97	11/12/97	RCRA METALS SOLID	Arsenic	1.3	mg/kg	1.3	~	7.82E+00	1.66E-01	1.66E-07
200041474	97ASPH8	asphalt	9/29/97	10/23/97	RCRA METALS SOLID	Barium	46.0	mg/kg	46.0	~	5.30E+03	8.68E-03	8.68E-09
200041474	97ASPH8	asphalt	9/29/97	10/23/97	RCRA METALS SOLID	Chromium	2.3	mg/kg	2.3	~	3.00E+01	7.67E-02	7.67E-08
200041421	97ASPH11A	asphalt	9/29/97	10/15/97	VOA SOLID	Methylene Chloride	5.9	ug/kg	5.90E-03	B	7.80E+00	(b)	(b)
200041422	97ASPH11A	asphalt	9/29/97	10/15/97	VOA SOLID	Methylene Chloride	8.8	ug/kg	8.80E-03	B	7.80E+00	(b)	(b)
200041475	97ASPH13	asphalt	10/1/97	11/12/97	RCRA METALS SOLID	Arsenic	0.9	mg/kg	0.9	~	7.82E+00	1.15E-01	1.15E-07
200041475	97ASPH13	asphalt	10/1/97	10/23/97	RCRA METALS SOLID	Barium	42.0	mg/kg	42.0	~	5.30E+03	7.92E-03	7.92E-09
200041475	97ASPH13	asphalt	10/1/97	10/23/97	RCRA METALS SOLID	Chromium	4.9	mg/kg	4.9	~	3.00E+01	1.63E-01	1.63E-07
200041423	97ASPH16A	asphalt	9/29/97	10/15/97	VOA SOLID	Methylene Chloride	7.1	ug/kg	7.10E-03	J	~~7.80E+00~~	(b)	(b)
200041423	97ASPH16A	asphalt	9/29/97	10/15/97	VOA SOLID	1, 1, 1-Trichloroethane	40.0	ug/kg	4.00E-02	~	1.20E+03	3.33E-05	3.33E-11
200041423	97ASPH16A	asphalt	9/29/97	10/15/97	VOA SOLID	Trichloroethene	34.0	ug/kg	3.40E-02	~	~~3.20E+00~~	1.06E-02	1.06E-08
200041423	97ASPH16A	asphalt	9/29/97	10/15/97	VOA SOLID	Tetrachloroethene	610.0	ug/kg	6.10E-01	~	5.40E+00	1.13E-01	1.13E-07
200041424	97ASPH16A	asphalt	9/29/97	10/15/97	VOA SOLID	Methylene Chloride	5.6	ug/kg	5.60E-03	B	7.80E+00	(b)	(b)
200041424	97ASPH16A	asphalt	9/29/97	10/15/97	VOA SOLID	1, 1, 1-Trichloroethane	15.0	ug/kg	1.50E-02	~	1.20E+03	1.25E-05	1.25E-11
200041424	97ASPH16A	asphalt	9/29/97	10/15/97	VOA SOLID	Trichloroethene	14.0	ug/kg	1.40E-02	~	3.20E+00	4.38E-03	4.38E-09
200041424	97ASPH16A	asphalt	9/29/97	10/15/97	VOA SOLID	Tetrachloroethene	230.0	ug/kg	2.30E-01	~	5.40E+00	4.26E-02	4.26E-08

ASPHALT SAMPLING DATA

BARRINGER SAMPLE NUMBER	LANL SAMPLE No.	MATRIX	DATE SAMPLED	DATE ANALYZED	ANALYSIS	CONTAMINANT	CONC.	UNITS	CONV	DATA UALIFIER (a	SAL	RATIO	RELATIVE RISK
20041427	97ASPH216	water	9/29/97	10/15/97	VOA LIQUID	Chloroform	5.5	ug/kg	5.50E-03	~	2.50E-01	2.20E-02	2.20E-08
200041427	97ASPH216	water	9/29/97	10/15/97	VOA LIQUID	romodichloromethane	3.8	ug/kg	3.80E-03	J	6.30E-01	6.03E-03	6.03E-09
200041428	97ASPH217	water	9/29/97	10/15/97	VOA LIQUID	Chloroform	6.1	ug/kg	6.10E-03	~	2.50E-01	2.44E-02	2.44E-08
200041428	97ASPH217	water	9/29/97	10/15/97	VOA LIQUID	romodichloromethane	4.7	ug/kg	4.70E-03	J	6.30E-01	7.46E-03	7.46E-09
200041428	97ASPH217	water	9/29/97	10/15/97	VOA LIQUID	irbromochloromethane	3.0	ug/kg	3.00E-03	J	5.30E+00	5.66E-04	5.66E-10
200041476	97ASPH18	asphalt	10/1/97	11/12/97	RCRA METALS SOLID	Arsenic	1.3	mg/kg	1.3	~	7.82E+00	1.66E-01	1.66E-07
200041476	97ASPH18	asphalt	10/1/97	10/23/97	RCRA METALS SOLID	Barium	32.0	mg/kg	32.0	~	5.30E+03	6.04E-03	6.04E-09
200041476	97ASPH18	asphalt	10/1/97	10/23/97	RCRA METALS SOLID	Chromium	2.6	mg/kg	2.6	~	2.10E+02	1.24E-02	1.24E-08
200041425	97ASPH21A	asphalt	10/1/97	10/16/97	VOA SOLID	Methylene Chloride	6.4	ug/kg	6.40E-03	B	7.80E+00	(b)	(b)
200041425	97ASPH21A	asphalt	10/1/97	10/16/97	VOA SOLID	Chloroform	4.3	ug/kg	4.30E-03	J	2.50E-01	1.72E-02	1.72E-08
200041425	97ASPH21A	asphalt	10/1/97	10/16/97	VOA SOLID	Tetrachloroethene	12.0	ug/kg	1.20E-02	~	3.20E+00	3.75E-03	3.75E-09
200041426	97ASPH21A	asphalt	10/1/97	10/16/97	VOA SOLID	Methylene Chloride	6.7	ug/kg	6.70E-03	B	7.80E+00	(b)	(b)
200041477	97ASPH23	asphalt	10/1/97	11/12/97	RCRA METALS SOLID	Arsenic	1.0	mg/kg	1.0	~	7.80E+00	1.28E-01	1.28E-07
200041477	97ASPH23	asphalt	10/1/97	10/23/97	RCRA METALS SOLID	Barium	27.0	mg/kg	27.0	~	5.30E+03	5.09E-03	5.09E-09
200041477	97ASPH23	asphalt	10/1/97	10/23/97	RCRA METALS SOLID	Chromium	4.3	mg/kg	4.3	~	2.10E+02	2.05E-02	2.05E-08
200044652	97ASPH26	asphalt	11/3/97	11/13/97	VOA SOLID	1,1,1 Trichloroethane	5.5	ug/kg	5.50E-03	~	1.20E+03	4.58E-06	4.58E-12
200044652	97ASPH26	asphalt	11/3/97	11/13/97	VOA SOLID	Tetrachloroethene	23.0	ug/kg	2.30E-02	~	5.40E+00	4.26E-03	4.26E-09
200044653	97ASPH26	asphalt	11/3/97	11/13/97	VOA SOLID	Tetrachloroethene	14.0	ug/kg	1.40E-02	~	5.40E+00	2.59E-03	2.59E-09
200044654	97ASPH27	asphalt	11/3/97	11/13/97	VOA SOLID	Methlylene Chloride	4.6	ug/kg	4.60E-03	J	7.80E+00	5.90E-04	5.90E-10
200044654	97ASPH27	asphalt	11/3/97	11/13/97	VOA SOLID	1,1,1 Trichloroethane	13.0	ug/kg	1.30E-02	~	1.20E+03	1.08E-05	1.08E-11
200044654	97ASPH27	asphalt	11/3/97	11/13/97	VOA SOLID	Tetrachloroethene	28.0	ug/kg	2.80E-02	~	5.40E+00	5.19E-03	5.19E-09
200044655	97ASPH27	asphalt	11/3/97	11/13/97	VOA SOLID	1,1,1 Trichloroethane	8.2	ug/kg	8.20E-03	~	1.20E+03	6.83E-06	6.83E-12
200044655	97ASPH27	asphalt	11/3/97	11/13/97	VOA SOLID	Tetrachloroethene	21.0	ug/kg	2.10E-02	~	5.40E+00	3.89E-03	3.89E-09
200044667	97ASPH29	asphalt	11/3/97	11/24/97	RCRA METAL SOLID	Arsenic	1.1	mg/kg	1.1	~	7.80E+00	1.41E-01	1.41E-07
200044667	97ASPH29	asphalt	11/3/97	11/13/97	RCRA METAL SOLID	Barium	41.0	mg/kg	41.0	~	5.30E+03	7.74E-03	7.74E-09
200044667	97ASPH29	asphalt	11/3/97	11/13/97	RCRA METAL SOLID	Cadmium	0.4	mg/kg	0.4	~	3.80E+01	1.05E-02	1.05E-08
200044667	97ASPH29	asphalt	11/3/97	11/13/97	RCRA METAL SOLID	Chromium	3.0	mg/kg	3.0	~	3.00E+01	1.00E-01	1.00E-07
200044656	97ASPH32	asphalt	11/3/97	11/13/97	VOA SOLID	Methlylene Chloride	4.5	ug/kg	4.50E-03	J	7.80E+00	5.77E-04	5.77E-10
200044656	97ASPH32	asphalt	11/3/97	11/13/97	VOA SOLID	Acetone	45.0	ug/kg	4.50E-02	J	2.10E+03	2.14E-05	2.14E-11
200044657	97ASPH32	asphalt	11/3/97	11/13/97	VOA SOLID	Methlylene Chloride	5.2	ug/kg	5.20E-03	~	7.80E+00	6.67E-04	6.67E-10

ASPHALT SAMPLING DATA

BARRINGER SAMPLE NUMBER	LANL SAMPLE No.	MATRIX	DATE SAMPLED	DATE ANALYZED	ANALYSIS	CONTAMINANT	CONC.	UNITS	CONV	DATA UALIFIER (a	SAL	RATIO	RELATIVE RISK
200044668	97ASPH34	asphalt	11/3/97	11/24/97	RCRA METAL SOLID	Arsenic	0.5	mg/kg	0.5	J	7.80E+00	6.41E-02	6.41E-08
200044668	97ASPH34	asphalt	11/3/97	11/13/97	RCRA METAL SOLID	Barium	41.0	mg/kg	41.0	~	5.30E+03	7.74E-03	7.74E-09
200044668	97ASPH34	asphalt	11/3/97	11/13/97	RCRA METAL SOLID	Chromium	2.5	mg/kg	2.5	~	3.00E+01	8.33E-02	8.33E-08
200044678	97ASPH37	water	11/3/97	11/11/97	VOA LIQUID	Acetone	40.0	mg/L	4.00E-02	J	2.10E+03	c)	c)
200044678	97ASPH37	water	11/3/97	11/11/97	VOA LIQUID	Chloroform	3.1	mg/L	3.10E-03	J	2.50E-01	c)	c)
200044679	97ASPH37	water	11/3/97	11/11/97	VOA LIQUID	Acetone	25.0	ug/kg	2.50E-02	J	2.10E+03	c)	c)
200044679	97ASPH37	water	11/3/97	11/11/97	VOA LIQUID	Chloroform	3.2	ug/kg	3.20E-03	J	2.50E-01	c)	c)
200044679	97ASPH37	water	11/3/97	11/11/97	VOA LIQUID	Acetone	25.0	ug/kg	2.50E-02	J	2.10E+03	c)	c)
200044679	97ASPH37	water	11/3/97	11/11/97	VOA LIQUID	Chloroform	3.2	ug/kg	3.20E-03	J	2.50E-01	c)	c)
200045443	97ASPH135RV	asphalt	11/12/97	12/2/97	RCRA METALS SOLID	Arsenic	1.0	mg/kg	1.0	~	7.80E+00	1.28E-01	1.28E-07
200045443	97ASPH135RV	asphalt	11/12/97	11/26/97	RCRA METALS SOLID	Barium	21.0	mg/kg	21.0	~	5.30E+03	3.96E-03	3.96E-09
200045443	97ASPH135RV	asphalt	11/12/97	11/26/97	RCRA METALS SOLID	Cadmium	0.5	mg/kg	0.5	~	3.80E+01	1.32E-02	1.32E-08
200045443	97ASPH135RV	asphalt	11/12/97	11/26/97	RCRA METALS SOLID	Chromium	0.8	mg/kg	0.8	~	3.00E+01	2.67E-02	2.67E-08
200045443	97ASPH135RV	asphalt	11/12/97	12/3/97	RCRA METALS SOLID	Mercury	0.2	mg/kg	0.2	~	2.50E-01	8.00E-01	8.00E-07
200044660	97ASPH39	asphalt	11/3/97	11/13/97	VOA SOLID	1,1,1 Trichloroethane	4.3	ug/kg	4.30E-03	J	1.20E+03	3.58E-06	3.58E-12
200044660	97ASPH39	asphalt	11/3/97	11/13/97	VOA SOLID	Tetrachloroethene	22.0	ug/kg	2.20E-02	~	5.40E+00	4.07E-03	4.07E-09
200044661	97ASPH39	asphalt	11/3/97	11/13/97	VOA SOLID	Methlylene Chloride	5.3	ug/kg	5.30E-03	~	7.80E+00	6.79E-04	6.79E-10
200044661	97ASPH39	asphalt	11/3/97	11/13/97	VOA SOLID	Acetone	31.0	ug/kg	3.10E-02	J	2.10E+03	1.48E-05	1.48E-11
200044661	97ASPH39	asphalt	11/3/97	11/13/97	VOA SOLID	1,1,1 Trichloroethane	7.1	ug/kg	7.10E-03	~	1.20E+03	5.92E-06	5.92E-12
200044661	97ASPH39	asphalt	11/3/97	11/13/97	VOA SOLID	Tetrachloroethene	34.0	ug/kg	3.40E-02	~	5.40E+00	6.30E-03	6.30E-09
200044669	97ASPH42	asphalt	11/3/97	11/24/97	RCRA METAL SOLID	Arsenic	0.4	mg/kg	0.4	J	7.80E+00	5.13E-02	5.13E-08
200044669	97ASPH42	asphalt	11/3/97	11/13/97	RCRA METAL SOLID	Barium	30.0	mg/kg	30.0	~	5.30E+03	5.66E-03	5.66E-09
200044669	97ASPH42	asphalt	11/3/97	11/13/97	RCRA METAL SOLID	Chromium	2.2	mg/kg	2.2	~	3.00E+01	7.33E-02	7.33E-08
200044801	97ASPH45	asphalt	11/4/97	11/14/97	VOA SOLID	Methylene Chloride	12.0	ug/kg	1.20E-02	B	7.80E+00	(b)	(b)
200044801	97ASPH45	asphalt	11/4/97	11/14/97	VOA SOLID	1,1,1 Trichloroethane	3.9	ug/kg	3.90E-03	J	1.20E+03	3.25E-06	3.25E-12
200044801	97ASPH45	asphalt	11/4/97	11/14/97	VOA SOLID	Tetrachloroethene	37.0	ug/kg	3.70E-02	~	5.40E+00	6.85E-03	6.85E-09
200044805	97ASPH45	asphalt	11/4/97	11/14/97	VOA SOLID	Methylene Chloride	8.9	ug/kg	8.90E-03	~	7.80E+00	1.14E-03	1.14E-09
200044805	97ASPH45	asphalt	11/4/97	11/14/97	VOA SOLID	1,1,1 Trichloroethane	8.1	ug/kg	8.10E-03	~	1.20E+03	6.75E-06	6.75E-12
200044805	97ASPH45	asphalt	11/4/97	11/14/97	VOA SOLID	Tetrachloroethene	44.0	ug/kg	4.40E-02	~	5.40E+00	8.15E-03	8.15E-09
200044833	97ASPH47	asphalt	11/4/97	11/25/97	RCRA METALS SOLID	Arsenic	0.6	mg/kg	0.6	~	7.80E+00	7.69E-02	7.69E-08
200044833	97ASPH47	asphalt	11/4/97	11/13/97	RCRA METALS SOLID	Barium	11.0	mg/kg	11.0	~	5.30E+03	2.08E-03	2.08E-09
200044833	97ASPH47	asphalt	11/4/97	11/20/97	RCRA METALS SOLID	Mercury	0.1	mg/kg	0.1	~	2.30E+01	4.35E-03	4.35E-09

ASPHALT SAMPLING DATA

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200044818	97ASPH50	water	11/4/97	11/11/97	VOA LIQUID	Acetone	27.0	ug/kg	2.70E-02	J	2.10E+03	(o)	
200044818	97ASPH50	water	11/4/97	11/11/97	VOA LIQUID	Chloroform	3.0	ug/kg	3.00E-03	J	2.50E-01	(o)	(o)
200044818	97ASPH50	water	11/4/97	11/11/97	VOA LIQUID	romodichloromethane	2.4	ug/kg	2.40E-03	J	6.30E-01	(o)	(o)
200044818	97ASPH50	water	11/4/97	11/11/97	VOA LIQUID	Acetone	24.0	ug/kg	2.40E-02	J	2.10E+03	(o)	(o)
200044826	97ASPH52	soil	11/4/97	11/18/97	SVOA SOLID	Phenanthrene	260.0	ug/kg	2.60E-01	J	18000 (d)	1.44E-05	1.44E-11
200044826	97ASPH52	soil	11/4/97	11/18/97	SVOA SOLID	Pyrene	300.0	ug/kg	3.00E-01	J	1.90E+03	1.58E-04	1.58E-10
200044838	97ASPH53	soil	11/4/97	11/25/97	RCRA METALS SOLID	Arsenic	0.5	mg/kg	0.5	~	7.80E+00	6.41E-02	6.41E-08
200044838	97ASPH53	soil	11/4/97	11/13/97	RCRA METALS SOLID	Barium	35.0	mg/kg	35.0	~	5.30E+03	6.60E-03	6.60E-09
200044838	97ASPH53	soil	11/4/97	11/13/97	RCRA METALS SOLID	Chromium	2.3	mg/kg	2.3	~	3.00E+01	7.67E-02	7.67E-08
200044808	97ASPH57	asphalt	11/4/97	11/12/97	VOA SOLID	Acetone	32.0	ug/kg	3.20E-02	J	2.10E+03	1.52E-05	1.52E-11
200044808	97ASPH57	asphalt	11/4/97	11/12/97	VOA SOLID	Tetrachloroethene	9.5	ug/kg	9.50E-03	~	7.80E+00	1.22E-03	1.22E-09
200044809	97ASPH57	asphalt	11/4/97	11/13/97	VOA SOLID	Methylene Chloride	4.6	ug/kg	4.60E-03	J	7.80E+00	5.90E-04	5.90E-10
200044809	97ASPH57	asphalt	11/4/97	11/13/97	VOA SOLID	Tetrachloroethene	13.0	ug/kg	1.30E-02	~	5.40E+00	2.41E-03	2.41E-09
200044839	97ASPH59	asphalt	11/4/97	11/25/97	RCRA METALS SOLID	Arsenic	0.4	mg/kg	0.4	J	7.80E+00	5.13E-02	5.13E-08
200044839	97ASPH59	asphalt	11/4/97	11/13/97	RCRA METALS SOLID	Barium	13.0	mg/kg	13.0	~	5.30E+03	2.45E-03	2.45E-09
200044839	97ASPH59	asphalt	11/4/97	11/13/97	RCRA METALS SOLID	Chromium	2.0	mg/kg	2.0	~	3.00E+01	6.67E-02	6.67E-08
200044840	97ASPH60	asphalt	11/4/97	11/25/97	RCRA METALS SOLID	Arsenic	0.8	mg/kg	0.8	~	7.80E+00	1.03E-01	1.03E-07
200044840	97ASPH60	asphalt	11/4/97	11/13/97	RCRA METALS SOLID	Barium	46.0	mg/kg	46.0	~	5.30E+03	8.68E-03	8.68E-09
200044840	97ASPH60	asphalt	11/4/97	11/13/97	RCRA METALS SOLID	Chromium	3.9	mg/kg	3.9	~	3.00E+01	1.30E-01	1.30E-07
200044810	97ASPH63	soil	11/4/97	11/13/97	VOA SOLID	Acetone	60.0	ug/kg	6.00E-02	~	2.10E+03	2.86E-05	2.86E-11
200044811	97ASPH63	soil	11/4/97	11/13/97	VOA SOLID	Acetone	45.0	ug/kg	4.50E-02	J	2.10E+03	2.14E-05	2.14E-11
200044841	97ASPH65	soil	11/4/97	11/25/97	RCRA METALS SOLID	Arsenic	0.5	mg/kg	0.5	J	7.80E+00	6.41E-02	6.41E-08
200044841	97ASPH65	soil	11/4/97	11/13/97	RCRA METALS SOLID	Barium	67.0	mg/kg	67.0	~	5.30E+03	1.26E-02	1.26E-08
200044841	97ASPH65	soil	11/4/97	11/13/97	RCRA METALS SOLID	Chromium	2.0	mg/kg	2.0	~	3.00E+01	6.67E-02	6.67E-08
200044841	97ASPH65	soil	11/4/97	11/13/97	RCRA METALS SOLID	Lead	3.0	mg/kg	3.0	~	4.00E+02	7.50E-03	7.50E-09
200044814	97ASPH70	soil	11/4/97	11/13/97	VOA SOLID	Tetrachloroethene	4.1	ug/kg	4.10E-03	J	5.40E+00	7.59E-04	7.59E-10
200044842	97ASPH71	soil	11/4/97	11/25/97	RCRA METALS SOLID	Arsenic	0.7	mg/kg	0.7	~	7.80E+00	8.97E-02	8.97E-08
200044842	97ASPH71	soil	11/4/97	11/13/97	RCRA METALS SOLID	Barium	72.0	mg/kg	72.0	~	5.30E+03	1.36E-02	1.36E-08

ASPHALT SAMPLING DATA

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200044842	97ASPH71	soil	11/4/97	11/13/97	RCRA METALS SOLID	Chromium	2.5	mg/kg	2.5	~	3.00E+01	8.33E-02	8.33E-08
200044842	97ASPH71	soil	11/4/97	11/13/97	RCRA METALS SOLID	Lead	4.0	mg/kg	4.0	~	4.00E+02	1.00E-02	1.00E-08
200045094	97ASPH77	soil	11/5/97	11/24/97	RCRA METALS SOLID	Arsenic	0.5	mg/kg	0.5	J	7.80E+00	6.41E-02	6.41E-08
200045094	97ASPH77	soil	11/5/97	11/17/97	RCRA METALS SOLID	Barium	54.0	mg/kg	54.0	~	5.30E+03	1.02E-02	1.02E-08
200045094	97ASPH77	soil	11/5/97	11/17/97	RCRA METALS SOLID	Chromium	3.5	mg/kg	3.5	~	3.00E+01	1.17E-01	1.17E-07
200045094	97ASPH77	soil	11/5/97	11/17/97	RCRA METALS SOLID	Lead	6.0	mg/kg	6.0	~	4.00E+02	1.50E-02	1.50E-08
200045086	97ASPH81	asphalt	11/5/97	11/14/97	VOA SOLID	Methylene Chloride	3.9	ug/kg	3.90E-03	J	7.80E+00	5.00E-04	5.00E-10
200045086	97ASPH81	asphalt	11/5/97	11/14/97	VOA SOLID	1,1,1-Trichloroethane	5.7	ug/kg	5.70E-03	~	1.20E+03	4.75E-06	4.75E-12
200045086	97ASPH81	asphalt	11/5/97	11/14/97	VOA SOLID	Tetrachloroethene	140.0	ug/kg	1.40E-01	~	5.40E+00	2.59E-02	2.59E-08
200045087	97ASPH81	asphalt	11/5/97	11/14/97	VOA SOLID	Methylene Chloride	5.7	ug/kg	5.70E-03	~	7.80E+00	7.31E-04	7.31E-10
200045087	97ASPH81	asphalt	11/5/97	11/14/97	VOA SOLID	1,1,1-Trichloroethane	4.8	ug/kg	4.80E-03	J	1.20E+03	4.00E-06	4.00E-12
200045087	97ASPH81	asphalt	11/5/97	11/14/97	VOA SOLID	Tetrachloroethene	140.0	ug/kg	1.40E-01	~	5.40E+00	2.59E-02	2.59E-08
200045087	97ASPH81	asphalt	11/5/97	11/14/97	VOA SOLID	Toluene	3.7	ug/kg	3.70E-03	J	7.90E+02	4.68E-06	4.68E-12
200045095	97ASPH83	asphalt	11/5/97	11/24/97	RCRA METALS SOLID	Arsenic	1.4	mg/kg	1.4	~	7.80E+00	1.79E-01	1.79E-07
200045095	97ASPH83	asphalt	11/5/97	11/17/97	RCRA METALS SOLID	Barium	63.0	mg/kg	63.0	~	5.30E+03	1.19E-02	1.19E-08
200045095	97ASPH83	asphalt	11/5/97	11/17/97	RCRA METALS SOLID	Chromium	3.7	mg/kg	3.7	~	3.00E+01	1.23E-01	1.23E-07
200045095	97ASPH83	asphalt	11/5/97	11/17/97	RCRA METALS SOLID	Lead	3.0	mg/kg	3.0	~	4.00E+02	7.50E-03	7.50E-09
200045095	97ASPH83	asphalt	11/5/97	11/20/97	RCRA METALS SOLID	Mercury	0.2	mg/kg	0.2	~	6.50E+00	3.08E-02	3.08E-08
200045111	97ASPH87	asphalt	11/5/97	11/14/97	VOA SOLID	1,1,1-Trichloroethane	26.0	ug/kg	2.60E-02	~	1.20E+03	2.17E-05	2.17E-11
200045111	97ASPH87	asphalt	11/5/97	11/14/97	VOA SOLID	Trichloroethene	6.3	ug/kg	6.30E-03	~	3.20E+00	1.97E-03	1.97E-09
200045111	97ASPH87	asphalt	11/5/97	11/14/97	VOA SOLID	Tetrachloroethene	960.0	ug/kg	9.60E-01	~	5.40E+00	1.78E-01	1.78E-07
200045112	97ASPH87	asphalt	11/5/97	11/14/97	VOA SOLID	Methylene Chloride	4.2	ug/kg	4.20E-03	J	7.80E+00	5.38E-04	5.38E-10
200045112	97ASPH87	asphalt	11/5/97	11/14/97	VOA SOLID	Acetone	22.0	ug/kg	2.20E-02	J	2.10E+03	1.05E-05	1.05E-11
200045112	97ASPH87	asphalt	11/5/97	11/14/97	VOA SOLID	2-Butanone	18.0	ug/kg	1.80E-02	~	7.10E+03	2.54E-06	2.54E-12
200045112	97ASPH87	asphalt	11/5/97	11/14/97	VOA SOLID	Trichloroethene	5.2	ug/kg	5.20E-03	~	3.20E+00	1.63E-03	1.63E-09
200045112	97ASPH87	asphalt	11/5/97	11/14/97	VOA SOLID	Tetrachloroethene	710.0	ug/kg	7.10E-01	~	5.40E+00	1.31E-01	1.31E-07
200045134	97ASPH89	asphalt	11/5/97	11/21/97	RCRA METAL SOLID	Arsenic	1.6	mg/kg	1.6	J	7.80E+00	2.05E-01	2.05E-07
200045134	97ASPH89	asphalt	11/5/97	11/17/97	RCRA METAL SOLID	Barium	44.0	mg/kg	44.0	~	5.30E+03	8.30E-03	8.30E-09
200045134	97ASPH89	asphalt	11/5/97	11/17/97	RCRA METAL SOLID	Chromium	4.0	mg/kg	4.0	~	3.00E+01	1.33E-01	1.33E-07
200045134	97ASPH89	asphalt	11/5/97	11/17/97	RCRA METAL SOLID	Lead	4.0	mg/kg	4.0	~	4.00E+02	1.00E-02	1.00E-08
200045115	97ASPH93	asphalt	11/5/97	11/14/97	VOA SOLID	Methylene Chloride	5.0	ug/kg	5.00E-03	~	7.80E+00	6.41E-04	6.41E-10
200045115	97ASPH93	asphalt	11/5/97	11/14/97	VOA SOLID	1,1,1-Trichloroethane	18.0	ug/kg	1.80E-02	~	1.20E+03	1.50E-05	1.50E-11
200045115	97ASPH93	asphalt	11/5/97	11/14/97	VOA SOLID	Tetrachloroethene	220.0	ug/kg	2.20E-01	~	5.40E+00	4.07E-02	4.07E-08

ASPHALT SAMPLING DATA

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200045115	97ASPH93	asphalt	11/5/97	11/14/97	VOA SOLID	Toluene	4.1	ug/kg	4.10E-03	J	7.90E+02	5.19E-06	5.19E-12
200045116	97ASPH93	asphalt	11/5/97	11/14/97	VOA SOLID	Methylene Chloride	4.4	ug/kg	4.40E-03	B	7.80E+00	(b)	(b)
200045116	97ASPH93	asphalt	11/5/97	11/14/97	VOA SOLID	1,1,1-Trichloroethane	32.0	ug/kg	3.20E-02	~	1.20E+03	2.67E-05	2.67E-11
200045116	97ASPH93	asphalt	11/5/97	11/14/97	VOA SOLID	Trichloroethene	4.1	ug/kg	4.10E-03	~	3.20E+00	1.28E-03	1.28E-09
200045116	97ASPH93	asphalt	11/5/97	11/14/97	VOA SOLID	Tetrachloroethene	290.0	ug/kg	2.90E-01	~	5.40E+00	5.37E-02	5.37E-08
200045136	97ASPH95	asphalt	11/5/97	11/21/97	RCRA METAL SOLID	Arsenic	0.4	mg/kg	0.4	J	7.80E+00	5.13E-02	5.13E-08
200045136	97ASPH95	asphalt	11/5/97	11/17/97	RCRA METAL SOLID	Barium	53.0	mg/kg	53.0	~	5.30E+03	1.00E-02	1.00E-08
200045136	97ASPH95	asphalt	11/5/97	11/17/97	RCRA METAL SOLID	Chromium	5.5	mg/kg	5.5	~	3.00E+01	1.83E-01	1.83E-07
200045136	97ASPH95	asphalt	11/5/97	11/17/97	RCRA METAL SOLID	Mercury	0.2	mg/kg	0.2	~	6.50E+00	3.08E-02	3.08E-08
200045119	97ASPH99	asphalt	11/5/97	11/17/97	VOA SOLID	Methylene Chloride	5.3	ug/kg	5.30E-03	~	7.80E+00	6.79E-04	6.79E-10
200045119	97ASPH99	asphalt	11/5/97	11/17/97	VOA SOLID	1,1,1-Trichloroethane	10.0	ug/kg	1.00E-02	~	1.20E+03	8.33E-06	8.33E-12
200045119	97ASPH99	asphalt	11/5/97	11/17/97	VOA SOLID	Tetrachloroethene	450.0	ug/kg	4.50E-01	~	5.40E+00	8.33E-02	8.33E-08
200045120	97ASPH99	asphalt	11/5/97	11/17/97	VOA SOLID	Methylene Chloride	5.9	ug/kg	5.90E-03	~	7.80E+00	7.56E-04	7.56E-10
200045120	97ASPH99	asphalt	11/5/97	11/17/97	VOA SOLID	1,1,1-Trichloroethane	10.0	ug/kg	1.00E-02	~	1.20E+03	8.33E-06	8.33E-12
200045120	97ASPH99	asphalt	11/5/97	11/17/97	VOA SOLID	Tetrachloroethene	400.0	ug/kg	4.00E-01	~	5.40E+00	7.41E-02	7.41E-08
200045118	97ASPH105	soil	11/6/97	11/17/97	VOA SOLID	Tetrachloroethene	3.5	ug/kg	3.50E-03	J	5.40E+00	6.48E-04	6.48E-10
200045132	97ASPH101	asphalt	11/5/97	11/21/97	RCRA METALS SOLID	Arsenic	0.5	mg/kg	0.5	J	7.80E+00	6.41E-02	6.41E-08
200045132	97ASPH101	asphalt	11/5/97	11/17/97	RCRA METALS SOLID	Barium	31.0	mg/kg	31.0	~	5.30E+03	5.85E-03	5.85E-09
200045132	97ASPH101	asphalt	11/5/97	11/17/97	RCRA METALS SOLID	Chromium	2.1	mg/kg	2.1	~	3.00E+01	7.00E-02	7.00E-08
200045137	97ASPH107	soil	11/5/97	11/21/97	RCRA METAL SOLID	Arsenic	0.4	mg/kg	0.4	J	7.80E+00	5.13E-02	5.13E-08
200045137	97ASPH107	soil	11/5/97	11/17/97	RCRA METAL SOLID	Barium	79.0	mg/kg	79.0	~	5.30E+03	1.49E-02	1.49E-08
200045137	97ASPH107	soil	11/5/97	11/17/97	RCRA METAL SOLID	Chromium	3.2	mg/kg	3.2	~	3.00E+01	1.07E-01	1.07E-07
200045137	97ASPH107	soil	11/5/97	11/17/97	RCRA METAL SOLID	Lead	6.0	mg/kg	6.0	~	4.00E+02	1.50E-02	1.50E-08
200045133	97ASPH113	soil	11/5/97	11/21/97	RCRA METAL SOLID	Arsenic	0.5	mg/kg	0.5	J	7.80E+00	6.41E-02	6.41E-08
200045133	97ASPH113	soil	11/5/97	11/17/97	RCRA METAL SOLID	Barium	55.0	mg/kg	55.0	~	5.30E+03	1.04E-02	1.04E-08
200045133	97ASPH113	soil	11/5/97	11/17/97	RCRA METAL SOLID	Chromium	4.3	mg/kg	4.3	~	3.00E+01	1.43E-01	1.43E-07
200045133	97ASPH113	soil	11/5/97	11/17/97	RCRA METAL SOLID	Lead	7.0	mg/kg	7.0	~	4.00E+02	1.75E-02	1.75E-08
200045395	97ASPH116	asphalt	11/12/97	11/20/97	VOA SOLID	Methylene Chloride	7.7	ug/kg	7.70E-03	B	7.80E+00	(b)	(b)
200045395	97ASPH116	asphalt	11/12/97	11/20/97	VOA SOLID	Toluene	5.1	ug/kg	5.10E-03	~	7.90E+02	6.46E-06	6.46E-12
200045396	97ASPH116	asphalt	11/12/97	11/20/97	VOA SOLID	Methylene Chloride	6.8	ug/kg	6.80E-03	B	7.80E+00	(b)	(b)
200045396	97ASPH116	asphalt	11/12/97	11/20/97	VOA SOLID	Trichlorofluromethane	4.2	ug/kg	4.20E-03	J	3.80E+02	1.11E-05	1.11E-11
200045397	97ASPH117	asphalt	11/12/97	11/20/97	VOA SOLID	Methylene Chloride	7.4	ug/kg	7.40E-03	B	7.80E+00	(b)	(b)
200045398	97ASPH117	asphalt	11/12/97	11/20/97	VOA SOLID	Toluene	6.1	ug/kg	6.10E-03	~	7.90E+02	7.72E-06	7.72E-12
200045398	97ASPH117	asphalt	11/12/97	11/20/97	VOA SOLID	Methylene Chloride	8.8	ug/kg	8.80E-03	B	7.80E+00	(b)	(b)

ASPHALT SAMPLING DATA

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200045425	97ASPH119RV	asphalt	11/12/97	12/2/97	RCRA METALS SOLID	Arsenic	0.7	mg/kg	7.00E-04	~	7.80E+00	8.97E-05	8.97E-11
200045425	97ASPH119RV	asphalt	11/12/97	11/26/97	RCRA METALS SOLID	Barium	108.0	mg/kg	1.08E-01	~	5.30E+03	2.04E-05	2.04E-11
200045425	97ASPH119RV	asphalt	11/12/97	11/26/97	RCRA METALS SOLID	Chromium	3.0	mg/kg	3.00E-03	~	3.00E+01	1.00E-04	1.00E-10
200045425	97ASPH119RV	asphalt	11/12/97	12/2/97	RCRA METALS SOLID	Lead	11.0	mg/kg	1.10E-02	~	4.00E+02	2.75E-05	2.75E-11
200045425	97ASPH119RV	asphalt	11/12/97	12/3/97	RCRA METALS SOLID	Mercury	0.3	mg/kg	3.00E-04	~	6.50E+00	4.62E-05	4.62E-11
200045399	97ASPH122	asphalt	11/12/97	11/20/97	VOA SOLID	richloroflouromethane	21.0	ug/kg	2.10E-02	~	3.80E+02	5.53E-05	5.53E-11
200045399	97ASPH122	asphalt	11/12/97	11/20/97	VOA SOLID	Methylene Chloride	5.4	ug/kg	5.40E-03	B	7.80E+00	(b)	(b)
200045400	97ASPH122	asphalt	11/12/97	11/20/97	VOA SOLID	Methylene Chloride	5.4	ug/kg	5.40E-03	B	7.80E+00	(b)	(b)
200045400	97ASPH122	asphalt	11/12/97	11/20/97	VOA SOLID	Trichlorofluromethane	17.0	ug/kg	1.70E-02	~	3.80E+02	4.47E-05	4.47E-11
200045438	97ASPH124RV	asphalt	11/12/97	12/2/97	RCRA METALS SOLID	Arsenic	0.9	mg/kg	0.9	~	7.80E+00	1.15E-01	1.15E-07
200045438	97ASPH124RV	asphalt	11/12/97	11/26/97	RCRA METALS SOLID	Barium	111.0	mg/kg	111.0	~	5.30E+03	2.09E-02	2.09E-08
200045438	97ASPH124RV	asphalt	11/12/97	11/26/97	RCRA METALS SOLID	Chromium	4.9	mg/kg	4.9	~	3.00E+01	1.63E-01	1.63E-07
200045438	97ASPH124RV	asphalt	11/12/97	12/2/97	RCRA METALS SOLID	Lead	4.0	mg/kg	4.0	~	4.00E+02	1.00E-02	1.00E-08
200045438	97ASPH124RV	asphalt	11/12/97	12/3/97	RCRA METALS SOLID	Mercury	0.2	mg/kg	0.2	~	6.50E+00	3.08E-02	3.08E-08
200045401	97ASPH127	asphalt	11/12/97	11/21/97	VOA SOLID	Trichlorofluromethane	5.1	ug/kg	5.10E-03	J	3.80E+02	1.34E-05	1.34E-11
200045402	97ASPH127	asphalt	11/12/97	11/21/97	VOA SOLID	Methylene Chloride	5.5	ug/kg	5.50E-03	B	7.80E+00	(b)	(b)
200045402	97ASPH127	asphalt	11/12/97	11/21/97	VOA SOLID	Trichlorofluromethane	21.0	ug/kg	2.10E-02	~	3.80E+02	5.53E-05	5.53E-11
200045439	97ASPH129RV	asphalt	11/12/97	12/2/1997	RCRA METALS SOLID	Arsenic	0.7	mg/kg	0.7	~	7.80E+00	8.97E-02	8.97E-08
200045439	97ASPH129RV	asphalt	11/12/97	11/26/97	RCRA METALS SOLID	Barium	61.0	mg/kg	61.0	~	5.30E+03	1.15E-02	1.15E-08
200045439	97ASPH129RV	asphalt	11/12/97	11/26/97	RCRA METALS SOLID	Cadmium	0.4	mg/kg	0.4	~	3.80E+01	1.05E-02	1.05E-08
200045439	97ASPH129RV	asphalt	11/12/97	11/26/97	RCRA METALS SOLID	Chromium	2.4	mg/kg	2.4	~	3.00E+01	8.00E-02	8.00E-08
200045440	97ASPH130	asphalt	11/12/97	12/2/1997	RCRA METALS SOLID	Arsenic	0.9	mg/kg	0.9	J	7.80E+00	1.15E-01	1.15E-07
200045440	97ASPH130	asphalt	11/12/97	11/26/97	RCRA METALS SOLID	Barium	39.0	mg/kg	39.0	~	5.30E+03	7.36E-03	7.36E-09
200045440	97ASPH130	asphalt	11/12/97	11/26/97	RCRA METALS SOLID	Cadmium	0.3	mg/kg	0.3	~	3.80E+01	7.89E-03	7.89E-09
200045440	97ASPH130	asphalt	11/12/97	11/26/97	RCRA METALS SOLID	Chromium	2.0	mg/kg	2.0	~	3.00E+01	6.67E-02	6.67E-08
200045440	97ASPH130	asphalt	11/12/97	12/3/97	RCRA METALS SOLID	Mercury	0.1	mg/kg	0.1	~	6.50E+00	1.54E-02	1.54E-08
200045403	97ASPH133	asphalt	11/12/97	11/21/97	VOA SOLID	Methylene Chloride	10.0	ug/kg	1.00E-02	B	7.80E+00	(b)	(b)
200045403	97ASPH133	asphalt	11/12/97	11/21/97	VOA SOLID	Toluene	4.2	ug/kg	4.20E-03	J	7.90E+02	5.32E-06	5.32E-12
200045404	97ASPH133	asphalt	11/12/97	11/21/97	VOA SOLID	Methylene Chloride	10.0	ug/kg	1.00E-02	B	7.80E+00	(b)	(b)
200045404	97ASPH133	asphalt	11/12/97	11/21/97	VOA SOLID	Trichlorofluromethane	11.0	ug/kg	1.10E-02	~	3.80E+02	2.89E-05	2.89E-11

ASPHALT SAMPLING DATA

BARRINGER SAMPLE NUMBER	LANL SAMPLE No.	MATRIX	DATE SAMPLED	DATE ANALYZED	ANALYSIS	CONTAMINANT	CONC.	UNITS	CONV	DATA UALIFIER (a	SAL	RATIO	RELATIVE RISK
200045405	97ASPH139	asphalt	11/12/97	11/21/97	VOA SOLID	Methylene Chloride	7.0	ug/kg	7.0	B	7.80E+00	(b)	(b)
200045409	97ASPH139	asphalt	11/12/97	11/21/97	VOA SOLID	Methylene Chloride	8.2	ug/kg	8.2	B	7.80E+00	(b)	(b)
200045409	97ASPH139	asphalt	11/12/97	11/21/97	VOA SOLID	Triohlorofluromethane	12.0	ug/kg	12.0	~	3.80E+02	3.16E-02	3.16E-08
200045441	97ASPH141RV	asphalt	11/12/97	12/2/97	RCRA METALS SOLID	Arsenic	0.8	mg/kg	0.8	~	7.80E+00	1.03E-01	1.03E-07
200045441	97ASPH141RV	asphalt	11/12/97	11/26/97	RCRA METALS SOLID	Barium	33.0	mg/kg	33.0	~	5.30E+03	6.23E-03	6.23E-09
200045441	97ASPH141RV	asphalt	11/12/97	11/26/97	RCRA METALS SOLID	Chromium	4.2	mg/kg	4.2	~	3.00E+01	1.40E-01	1.40E-07
200045441	97ASPH141RV	asphalt	11/12/97	12/2/97	RCRA METALS SOLID	Lead	4.0	mg/kg	4.0	~	4.00E+02	1.00E-02	1.00E-08
200045410	97ASPH145	asphalt	11/12/97	11/21/97	VOA SOLID	Methylene Chloride	9.7	ug/kg	9.70E-03	B	7.80E+00	(b)	(b)
200045410	97ASPH145	asphalt	11/12/97	11/21/97	VOA SOLID	Toluene	4.0	ug/kg	4.00E-03	J	7.90E+02	5.06E-06	5.06E-12
200045410	97ASPH145	asphalt	11/12/97	11/21/97	VOA SOLID	richlorofluoromethane	13.0	ug/kg	1.30E-02	~	3.80E+02	3.42E-05	3.42E-11
200045442	97ASPH147RV	asphalt	11/12/97	12/2/97	RCRA METALS SOLID	Arsenic	0.4	mg/kg	0.4	~	7.80E+00	5.13E-02	5.13E-08
200045442	97ASPH147RV	asphalt	11/12/97	11/26/97	RCRA METALS SOLID	Barium	65.0	mg/kg	65.0	~	5.30E+03	1.23E-02	1.23E-08
200045442	97ASPH147RV	asphalt	11/12/97	11/26/97	RCRA METALS SOLID	Chromium	3.2	mg/kg	3.2	~	3.00E+01	1.07E-01	1.07E-07
200046406	97ASPH151	asphalt	11/17/97	11/26/97	VOA SOLID	Methylene Chloride	3.8	ug/kg	3.80E-03	J	7.80E+00	4.87E-04	4.87E-10
200046406	97ASPH151	asphalt	11/17/97	11/26/97	VOA SOLID	Acetone	37.0	ug/kg	3.70E-02	J	2.10E+03	1.76E-05	1.76E-11
200046406	97ASPH151	asphalt	11/17/97	11/26/97	VOA SOLID	Toluene	4.5	ug/kg	4.50E-03	J	7.90E+02	5.70E-06	5.70E-12
200046408	97ASPH151	asphalt	11/17/97	11/26/97	VOA SOLID	Methylene Chloride	4.1	ug/kg	4.10E-03	J	7.80E+00	5.26E-04	5.26E-10
200046408	97ASPH151	asphalt	11/17/97	11/26/97	VOA SOLID	Acetone	24.0	ug/kg	2.40E-02	J	2.10E+03	1.14E-05	1.14E-11
200046408	97ASPH151	asphalt	11/17/97	11/26/97	VOA SOLID	richlorofluoromethane	3.6	ug/kg	3.60E-03	J	3.80E+02	9.47E-06	9.47E-12
200046441	97ASPH153	asphalt	11/17/97	12/2/97	RCRA METALS SOLID	Arsenic	0.4	mg/kg	0.4	~	7.80E+00	5.13E-02	5.13E-08
200046441	97ASPH153	asphalt	11/17/97	11/26/97	RCRA METALS SOLID	Barium	77.0	mg/kg	77.0	~	5.30E+03	1.45E-02	1.45E-08
200046441	97ASPH153	asphalt	11/17/97	11/26/97	RCRA METALS SOLID	Chromium	4.8	mg/kg	4.8	~	3.00E+01	1.60E-01	1.60E-07
200046441	97ASPH153	asphalt	11/17/97	12/2/97	RCRA METALS SOLID	Lead	4.0	mg/kg	4.0	~	4.00E+02	1.00E-02	1.00E-08
200046441	97ASPH153	asphalt	11/17/97	12/3/97	RCRA METALS SOLID	Mercury	0.4	mg/kg	0.4	~	6.50E+00	6.15E-02	6.15E-08
200046412	97ASPH157	soil	11/17/97	11/26/97	VOA SOLID	Acetone	68.0	ug/kg	6.80E-02	~	2.10E+03	3.24E-05	3.24E-11
200046413	97ASPH157	soil	11/17/97	11/26/97	VOA SOLID	Acetone	54.0	ug/kg	5.40E-02	~	2.10E+03	2.57E-05	2.57E-11
200046413	97ASPH157	soil	11/17/97	11/26/97	VOA SOLID	Toluene	10.0	ug/kg	1.00E-02	~	7.90E+02	1.27E-05	1.27E-11
200046429	97ASPH158	soil	11/17/97	11/27/97	SVOA SOLID	(2-Ethylhexyl)phthala	170.0	ug/kg	1.70E-01	J	3.20E+01	5.31E-03	5.31E-09
200046442	97ASPH159	soil	11/17/97	12/2/97	RCRA METALS SOLID	Arsenic	0.7	mg/kg	0.7	~	7.80E+00	8.97E-02	8.97E-08
200046442	97ASPH159	soil	11/17/97	11/26/97	RCRA METALS SOLID	Barium	35.0	mg/kg	35.0	~	5.30E+03	6.60E-03	6.60E-09
200046442	97ASPH159	soil	11/17/97	11/26/97	RCRA METALS SOLID	Chromium	2.5	mg/kg	2.5	~	3.00E+01	8.33E-02	8.33E-08

ASPHALT SAMPLING DATA

BARRINGER SAMPLE NUMBER	LANL SAMPLE No.	MATRIX	DATE SAMPLED	DATE ANALYZED	ANALYSIS	CONTAMINANT	CONC.	UNITS	CONV	DATA UALIFIER (a	SAL	RATIO	RELATIVE RISK
200046442	97ASPH159	soil	11/17/97	12/2/97	RCRA METALS SOLID	Lead	4.0	mg/kg	4.0	~	4.00E+02	1.00E-02	1.00E-08
200046414	97ASPH163	asphalt	11/17/97	11/26/97	VOA SOLID	Methylene Chloride	3.8	ug/kg	3.80E-03	J	7.80E+00	4.87E-04	4.87E-10
200046414	97ASPH163	asphalt	11/17/97	11/26/97	VOA SOLID	Toluene	4.4	ug/kg	4.40E-03	J	7.90E+02	5.57E-06	5.57E-12
200046415	97ASPH163	asphalt	11/17/97	11/26/97	VOA SOLID	Toluene	5.9	ug/kg	5.90E-03	~	7.90E+02	7.47E-06	7.47E-12
200046443	97ASPH165	asphalt	11/17/97	12/2/97	RCRA METALS SOLID	Arsenic	0.4	mg/kg	0.4	~	7.80E+00	5.13E-02	5.13E-08
200046443	97ASPH165	asphalt	11/17/97	11/26/97	RCRA METALS SOLID	Barium	55.0	mg/kg	55.0	~	5.30E+03	1.04E-02	1.04E-08
200046443	97ASPH165	asphalt	11/17/97	11/26/97	RCRA METALS SOLID	Chromium	2.6	mg/kg	2.6	~	3.00E+01	8.67E-02	8.67E-08
200046416	97ASPH169	soil	11/17/97	11/26/97	VOA SOLID	Acetone	43.0	ug/kg	4.30E-02	J	2.10E+03	2.05E-05	2.05E-11
200046416	97ASPH169	soil	11/17/97	11/26/97	VOA SOLID	Toluene	3.5	ug/kg	3.50E-03	J	7.90E+02	4.43E-06	4.43E-12
200046417	97ASPH169	soil	11/17/97	11/26/97	VOA SOLID	Acetone	76.0	ug/kg	7.60E-02	~	2.10E+03	3.62E-05	3.62E-11
200046444	97ASPH171	soil	11/17/97	12/2/97	RCRA METALS SOLID	Arsenic	0.7	mg/kg	0.7	~	7.80E+00	8.97E-02	8.97E-08
200046444	97ASPH171	soil	11/17/97	11/26/97	RCRA METALS SOLID	Barium	26.0	mg/kg	26.0	~	5.30E+03	4.91E-03	4.91E-09
200046444	97ASPH171	soil	11/17/97	11/26/97	RCRA METALS SOLID	Cadmium	0.5	mg/kg	0.5	~	3.80E+01	1.32E-02	1.32E-08
200046444	97ASPH171	soil	11/17/97	11/26/97	RCRA METALS SOLID	Chromium	1.7	mg/kg	1.7	~	3.00E+01	5.67E-02	5.67E-08
200046444	97ASPH171	soil	11/17/97	12/2/97	RCRA METALS SOLID	Lead	4.0	mg/kg	4.0	~	4.00E+02	1.00E-02	1.00E-08
200046418	97ASPH175	soil	11/17/97	11/26/97	VOA SOLID	Acetone	21.0	ug/kg	2.10E-02	J	2.10E+03	1.00E-05	1.00E-11
200046418	97ASPH175	soil	11/17/97	11/26/97	VOA SOLID	Toluene	5.6	ug/kg	5.60E-03	~	7.90E+02	7.09E-06	7.09E-12
200046419	97ASPH175	soil	11/17/97	11/26/97	VOA SOLID	Acetone	55.0	ug/kg	5.50E-02	~	2.10E+03	2.62E-05	2.62E-11
200046419	97ASPH175	soil	11/17/97	11/26/97	VOA SOLID	Toluene	3.8	ug/kg	3.80E-03	J	7.90E+02	4.81E-06	4.81E-12
200046447	97ASPH177	soil	11/17/97	12/2/97	RCRA METALS SOLID	Arsenic	0.9	mg/kg	0.9	~	7.80E+00	1.15E-01	1.15E-07
200046447	97ASPH177	soil	11/17/97	11/26/97	RCRA METALS SOLID	Barium	48.0	mg/kg	48.0	~	5.30E+03	9.06E-03	9.06E-09
200046447	97ASPH177	soil	11/17/97	11/26/97	RCRA METALS SOLID	Chromium	2.9	mg/kg	2.9	~	3.00E+01	9.67E-02	9.67E-08
200046447	97ASPH177	soil	11/17/97	12/3/97	RCRA METALS SOLID	Lead	6.0	mg/kg	6.0	~	4.00E+02	1.50E-02	1.50E-08
200046420	97ASPH181	soil	11/17/97	11/26/97	VOA SOLID	Acetone	120.0	ug/kg	1.20E-01	~	2.10E+03	5.71E-05	5.71E-11
200046421	97ASPH181	soil	11/17/97	11/26/97	VOA SOLID	Acetone	33.0	ug/kg	3.30E-02	J	2.10E+03	1.57E-05	1.57E-11
200046449	97ASPH183	soil	11/17/97	12/2/97	RCRA METALS SOLID	Arsenic	0.7	mg/kg	0.7	~	7.80E+00	8.97E-02	8.97E-08
200046449	97ASPH183	soil	11/17/97	11/26/97	RCRA METALS SOLID	Barium	41.0	mg/kg	41.0	~	5.30E+03	7.74E-03	7.74E-09
200046449	97ASPH183	soil	11/17/97	11/26/97	RCRA METALS SOLID	Cadmium	0.3	mg/kg	0.3	~	3.80E+01	7.89E-03	7.89E-09
200046449	97ASPH183	soil	11/17/97	11/26/97	RCRA METALS SOLID	Chromium	2.5	mg/kg	2.5	~	3.00E+01	8.33E-02	8.33E-08
200046449	97ASPH183	soil	11/17/97	12/2/97	RCRA METALS SOLID	Lead	10.0	mg/kg	10.0	~	4.00E+02	2.50E-02	2.50E-08

ASPHALT SAMPLING DATA

BARRINGER SAMPLE NUMBER	LANL SAMPLE No.	MATRIX	DATE SAMPLED	DATE ANALYZED	ANALYSIS	CONTAMINANT	CONC.	UNITS	CONV	DATA UALIFIER (a	SAL	RATIO	RELATIVE RISK
200046423	97ASPH187	asphalt	11/17/97	11/27/97	VOA SOLID	Toluene	3.7	ug/kg	3.70E-03	J	7.90E+02	4.68E-06	4.68E-12
200046450	97ASPH189	asphalt	11/17/97	12/2/97	RCRA METALS SOLID	Arsenic	0.4	mg/kg	0.4	~	7.80E+00	5.13E-02	5.13E-08
200046450	97ASPH189	asphalt	11/17/97	11/26/97	RCRA METALS SOLID	Barium	73.0	mg/kg	73.0	~	5.30E+03	1.38E-02	1.38E-08
200046450	97ASPH189	asphalt	11/17/97	11/26/97	RCRA METALS SOLID	Chromium	3.1	mg/kg	3.1	~	3.00E+01	1.03E-01	1.03E-07
200046450	97ASPH189	asphalt	11/17/97	12/3/97	RCRA METALS SOLID	Mercury	0.1	mg/kg	0.1	~	2.30E+01	4.35E-03	4.35E-09
200046426	97ASPH193	asphalt	11/17/97	11/27/97	VOA SOLID	Toluene	4.9	ug/kg	4.90E-03	J	7.90E+02	6.20E-06	6.20E-12
200046451	97ASPH195	asphalt	11/17/97	12/2/97	RCRA METALS SOLID	Arsenic	0.5	mg/kg	0.5	~	7.80E+00	6.41E-02	6.41E-08
200046451	97ASPH195	asphalt	11/17/97	11/26/97	RCRA METALS SOLID	Barium	69.0	mg/kg	69.0	~	5.30E+03	1.30E-02	1.30E-08
200046451	97ASPH195	asphalt	11/17/97	11/26/97	RCRA METALS SOLID	Chromium	2.8	mg/kg	2.8	~	3.00E+01	9.33E-02	9.33E-08
200046451	97ASPH195	asphalt	11/17/97	12/2/97	RCRA METALS SOLID	Lead	9.0	mg/kg	9.0	~	4.00E+02	2.25E-02	2.25E-08
200045078	97ASPH223	asphalt	11/5/97	11/14/97	VOA SOLID	Tetrachloroethene	6.0	ug/kg	6.00E-03	~	5.40E+00	1.11E-03	1.11E-09
200045079	97ASPH223	asphalt	11/5/97	11/14/97	VOA SOLID	Methylene Chloride	9.5	ug/kg	9.50E-03	B	7.80E+00	(b)	(b)
200045079	97ASPH223	asphalt	11/5/97	11/14/97	VOA SOLID	Tetrachloroethene	4.9	ug/kg	4.90E-03	J	5.40E+00	9.07E-04	9.07E-10
200045080	97ASPH225	asphalt	11/5/97	11/14/97	VOA SOLID	Tetrachloroethene	8.0	ug/kg	8.00E-03	~	5.40E+00	1.48E-03	1.48E-09
200045080	97ASPH225	asphalt	11/5/97	11/14/97	VOA SOLID	Methylene Chloride	9.9	ug/kg	9.90E-03	B	7.80E+00	(b)	(b)
200045081	97ASPH225	asphalt	11/5/97	11/14/97	VOA SOLID	Methylene Chloride	5.7	ug/kg	5.70E-03	~	7.80E+00	7.31E-04	7.31E-10
200045082	97ASPH227	asphalt	11/5/97	11/14/97	VOA SOLID	Methylene Chloride	3.6	ug/kg	3.60E-03	J	7.80E+00	4.62E-04	4.62E-10
200045082	97ASPH227	asphalt	11/5/97	11/14/97	VOA SOLID	1,1,1-Trichloroethane	17.0	ug/kg	1.70E-02	~	1.20E+03	1.42E-05	1.42E-11
200045082	97ASPH227	asphalt	11/5/97	11/14/97	VOA SOLID	Tetrachloroethene	11.0	ug/kg	1.10E-02	~	5.40E+00	2.04E-03	2.04E-09
200045083	97ASPH227	asphalt	11/5/97	11/14/97	VOA SOLID	1,1,1-Trichloroethane	7.9	ug/kg	7.90E-03	~	1.20E+03	6.58E-06	6.58E-12
200045083	97ASPH227	asphalt	11/5/97	11/14/97	VOA SOLID	Tetrachloroethene	16.0	ug/kg	1.60E-02	~	5.40E+00	2.96E-03	2.96E-09
200045088	97ASPH229	asphalt	11/5/97	11/14/97	VOA SOLID	Methylene Chloride	4.7	ug/kg	4.70E-03	J	7.80E+00	6.03E-04	6.03E-10
200045088	97ASPH229	asphalt	11/5/97	11/14/97	VOA SOLID	Tetrachloroethene	4.4	ug/kg	4.40E-03	J	5.40E+00	8.15E-04	8.15E-10
200045089	97ASPH229	asphalt	11/5/97	11/14/97	VOA SOLID	Tetrachloroethene	3.7	ug/kg	3.70E-03	J	5.40E+00	6.85E-04	6.85E-10
200045113	97ASPH231	asphalt	11/5/97	11/14/97	VOA SOLID	Methylene Chloride	5.8	ug/kg	5.80E-03	~	7.80E+00	7.44E-04	7.44E-10
200045113	97ASPH231	asphalt	11/5/97	11/14/97	VOA SOLID	1,1,1-Trichloroethane	22.0	ug/kg	2.20E-02	~	1.20E+03	1.83E-05	1.83E-11
200045113	97ASPH231	asphalt	11/5/97	11/14/97	VOA SOLID	Trichloroethene	4.6	ug/kg	4.60E-03	J	3.20E+00	1.44E-03	1.44E-09
200045113	97ASPH231	asphalt	11/5/97	11/14/97	VOA SOLID	Tetrachloroethene	640.0	ug/kg	6.40E-01	~	5.40E+00	1.19E-01	1.19E-07
200045114	97ASPH231	asphalt	11/5/97	11/14/97	VOA SOLID	Methylene Chloride	6.3	ug/kg	6.30E-03	~	7.80E+00	8.08E-04	8.08E-10
200045114	97ASPH231	asphalt	11/5/97	11/14/97	VOA SOLID	Acetone	57.0	ug/kg	5.70E-02	~	2.10E+03	2.71E-05	2.71E-11
200045114	97ASPH231	asphalt	11/5/97	11/14/97	VOA SOLID	1,1,1-Trichloroethane	21.0	ug/kg	2.10E-02	~	1.20E+03	1.75E-05	1.75E-11
200045114	97ASPH231	asphalt	11/5/97	11/14/97	VOA SOLID	Trichloroethene	5.7	ug/kg	5.70E-03	~	3.20E+00	1.78E-03	1.78E-09

ASPHALT SAMPLING DATA

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200045114	97ASPH231	asphalt	11/5/97	11/14/97	VOA SOLID	Tetrachloroethene	630.0	ug/kg	6.30E-01	~	5.40E+00	1.17E-01	1.17E-07
200045114	97ASPH231	asphalt	11/5/97	11/14/97	VOA SOLID	Toluene	4.7	ug/kg	4.70E-03	~	7.90E+02	5.95E-06	5.95E-12
200048051	97ASPH202	asphalt	12/1/97	12/22/97	RCRA METALS SOLID	Arsenic	0.2	mg/kg	0.2	J	7.80E+00	2.56E-02	2.56E-08
200048051	97ASPH202	asphalt	12/1/97	12/22/97	RCRA METALS SOLID	Barium	38	mg/kg	38	~	5.30E+03	7.17E-03	7.17E-09
200048052	97ASPH208	asphalt	12/1/97	12/22/97	RCRA METALS SOLID	Arsenic	0.6	mg/kg	0.6	~	7.80E+00	7.69E-02	7.69E-08
200048052	97ASPH208	asphalt	12/1/97	12/22/97	RCRA METALS SOLID	Barium	37	mg/kg	37	~	5.30E+03	6.98E-03	6.98E-09
200048053	97ASPH213	soil	12/1/97	12/22/97	RCRA METALS SOLID	Arsenic	0.3	mg/kg	0.3	~	7.80E+00	3.85E-02	3.85E-08
200048053	97ASPH213	soil	12/1/97	12/22/97	RCRA METALS SOLID	Barium	24	mg/kg	24	~	5.30E+03	4.53E-03	4.53E-09

NOTES:

(a) "B" in the Data Qualifies column indicates that the constituent was identified in the waste samples' corresponding analytical method blank.

"J" in the Data Qualifier column indicates that the concentration of a constituent is an estimate only. The constituent is confirmed present, but the concentration is at or below the analytical laboratory's limit of quantitation.

(b) These constituents have been confirmed to be present as the result of analytical laboratory contamination. Therefore, they have not been included in the risk screening

(c) This sample was a field blank. The water never contacted asphalt/soil or equipment contaminated with asphalt soil

(d) Insufficient toxicological data exists for phenanthrene to develop a SAL. The SAL for phenanthrene's analogue, anthracene, was used for this analysis.

ASPHALT SAMPLING DATA

BARRINGER SAMPLE NUMBER	LANL SAMPLE No.	MATRIX	DATE SAMPLED	DATE ANALYZED	ANALYSIS	CONTAMINANT	CONC.	UNITS	CONV	DATA UALIFIER (a	SAL	RATIO	RELATIVE RISK
200046423	97ASPH187	asphalt	11/17/97	11/27/97	VOA SOLID	Toluene	3.7	ug/kg	3.70E-03	J	7.90E+02	4.68E-06	4.68E-12
200046450	97ASPH189	asphalt	11/17/97	12/2/97	RCRA METALS SOLID	Arsenic	0.4	mg/kg	0.4	~	7.80E+00	5.13E-02	5.13E-08
200046450	97ASPH189	asphalt	11/17/97	11/26/97	RCRA METALS SOLID	Barium	73.0	mg/kg	73.0	~	5.30E+03	1.38E-02	1.38E-08
200046450	97ASPH189	asphalt	11/17/97	11/26/97	RCRA METALS SOLID	Chromium	3.1	mg/kg	3.1	~	3.00E+01	1.03E-01	1.03E-07
200046450	97ASPH189	asphalt	11/17/97	12/3/97	RCRA METALS SOLID	Mercury	0.1	mg/kg	0.1	~	2.30E+01	4.35E-03	4.35E-09
200046426	97ASPH193	asphalt	11/17/97	11/27/97	VOA SOLID	Toluene	4.9	ug/kg	4.90E-03	J	7.90E+02	6.20E-06	6.20E-12
200046451	97ASPH195	asphalt	11/17/97	12/2/97	RCRA METALS SOLID	Arsenic	0.5	mg/kg	0.5	~	7.80E+00	6.41E-02	6.41E-08
200046451	97ASPH195	asphalt	11/17/97	11/26/97	RCRA METALS SOLID	Barium	69.0	mg/kg	69.0	~	5.30E+03	1.30E-02	1.30E-08
200046451	97ASPH195	asphalt	11/17/97	11/26/97	RCRA METALS SOLID	Chromium	2.8	mg/kg	2.8	~	3.00E+01	9.33E-02	9.33E-08
200046451	97ASPH195	asphalt	11/17/97	12/2/97	RCRA METALS SOLID	Lead	9.0	mg/kg	9.0	~	4.00E+02	2.25E-02	2.25E-08
200045078	97ASPH223	asphalt	11/5/97	11/14/97	VOA SOLID	Tetrachloroethene	6.0	ug/kg	6.00E-03	~	5.40E+00	1.11E-03	1.11E-09
200045079	97ASPH223	asphalt	11/5/97	11/14/97	VOA SOLID	Methylene Chloride	9.5	ug/kg	9.50E-03	B	7.80E+00	(b)	(b)
200045079	97ASPH223	asphalt	11/5/97	11/14/97	VOA SOLID	Tetrachloroethene	4.9	ug/kg	4.90E-03	J	5.40E+00	9.07E-04	9.07E-10
200045080	97ASPH225	asphalt	11/5/97	11/14/97	VOA SOLID	Tetrachloroethene	8.0	ug/kg	8.00E-03	~	5.40E+00	1.48E-03	1.48E-09
200045080	97ASPH225	asphalt	11/5/97	11/14/97	VOA SOLID	Methylene Chloride	9.9	ug/kg	9.90E-03	B	7.80E+00	(b)	(b)
200045081	97ASPH225	asphalt	11/5/97	11/14/97	VOA SOLID	Methylene Chloride	5.7	ug/kg	5.70E-03	~	7.80E+00	7.31E-04	7.31E-10
200045082	97ASPH227	asphalt	11/5/97	11/14/97	VOA SOLID	Methylene Chloride	3.6	ug/kg	3.60E-03	J	7.80E+00	4.62E-04	4.62E-10
200045082	97ASPH227	asphalt	11/5/97	11/14/97	VOA SOLID	1,1,1-Trichloroethane	17.0	ug/kg	1.70E-02	~	1.20E+03	1.42E-05	1.42E-11
200045082	97ASPH227	asphalt	11/5/97	11/14/97	VOA SOLID	Tetrachloroethene	11.0	ug/kg	1.10E-02	~	5.40E+00	2.04E-03	2.04E-09
200045083	97ASPH227	asphalt	11/5/97	11/14/97	VOA SOLID	1,1,1-Triohloroethane	7.9	ug/kg	7.90E-03	~	1.20E+03	6.58E-06	6.58E-12
200045083	97ASPH227	asphalt	11/5/97	11/14/97	VOA SOLID	Tetrachloroethene	16.0	ug/kg	1.60E-02	~	5.40E+00	2.96E-03	2.96E-09
200045088	97ASPH229	asphalt	11/5/97	11/14/97	VOA SOLID	Methylene Chloride	4.7	ug/kg	4.70E-03	J	7.80E+00	6.03E-04	6.03E-10
200045088	97ASPH229	asphalt	11/5/97	11/14/97	VOA SOLID	Tetrachloroethene	4.4	ug/kg	4.40E-03	J	5.40E+00	8.15E-04	8.15E-10
200045089	97ASPH229	asphalt	11/5/97	11/14/97	VOA SOLID	Tetrachloroethene	3.7	ug/kg	3.70E-03	J	5.40E+00	6.85E-04	6.85E-10
200045113	97ASPH231	asphalt	11/5/97	11/14/97	VOA SOLID	Methylene Chloride	5.8	ug/kg	5.80E-03	~	7.80E+00	7.44E-04	7.44E-10
200045113	97ASPH231	asphalt	11/5/97	11/14/97	VOA SOLID	1,1,1-Trichloroethane	22.0	ug/kg	2.20E-02	~	1.20E+03	1.83E-05	1.83E-11
200045113	97ASPH231	asphalt	11/5/97	11/14/97	VOA SOLID	Trichloroethene	4.6	ug/kg	4.60E-03	J	3.20E+00	1.44E-03	1.44E-09
200045113	97ASPH231	asphalt	11/5/97	11/14/97	VOA SOLID	Tetrachloroethene	640.0	ug/kg	6.40E-01	~	5.40E+00	1.19E-01	1.19E-07
200045114	97ASPH231	asphalt	11/5/97	11/14/97	VOA SOLID	Methylene Chloride	6.3	ug/kg	6.30E-03	~	7.80E+00	8.08E-04	8.08E-10
200045114	97ASPH231	asphalt	11/5/97	11/14/97	VOA SOLID	Acetone	57.0	ug/kg	5.70E-02	~	2.10E+03	2.71E-05	2.71E-11
200045114	97ASPH231	asphalt	11/5/97	11/14/97	VOA SOLID	1,1,1-Trichloroethane	21.0	ug/kg	2.10E-02	~	1.20E+03	1.75E-05	1.75E-11
200045114	97ASPH231	asphalt	11/5/97	11/14/97	VOA SOLID	Trichloroethene	5.7	ug/kg	5.70E-03	~	3.20E+00	1.78E-03	1.78E-09

ASPHALT SAMPLING DATA

BARRINGER SAMPLE NUMBER	LANL SAMPLE No.	MATRIX	DATE SAMPLED	DATE ANALYZED	ANALYSIS	CONTAMINANT	CONC.	UNITS	CONV	DATA UALIFIER (a	SAL	RATIO	RELATIVE RISK
200045114	97ASPH231	asphalt	11/5/97	11/14/97	VOA SOLID	Tetrachloroethene	630.0	ug/kg	6.30E-01	~	5.40E+00	1.17E-01	1.17E-07
200045114	97ASPH231	asphalt	11/5/97	11/14/97	VOA SOLID	Toluene	4.7	ug/kg	4.70E-03	~	7.90E+02	5.95E-06	5.95E-12
200048051	97ASPH202	asphalt	12/1/97	12/22/97	RCRA METALS SOLID	Arsenic	0.2	mg/kg	0.2	J	7.80E+00	2.56E-02	2.56E-08
200048051	97ASPH202	asphalt	12/1/97	12/22/97	RCRA METALS SOLID	Barium	38	mg/kg	38	~	5.30E+03	7.17E-03	7.17E-09
200048052	97ASPH208	asphalt	12/1/97	12/22/97	RCRA METALS SOLID	Arsenic	0.6	mg/kg	0.6	~	7.80E+00	7.69E-02	7.69E-08
200048052	97ASPH208	asphalt	12/1/97	12/22/97	RCRA METALS SOLID	Barium	37	mg/kg	37	~	5.30E+03	6.98E-03	6.98E-09
200048053	97ASPH213	soil	12/1/97	12/22/97	RCRA METALS SOLID	Arsenic	0.3	mg/kg	0.3	~	7.80E+00	3.85E-02	3.85E-08
200048053	97ASPH213	soil	12/1/97	12/22/97	RCRA METALS SOLID	Barium	24	mg/kg	24	~	5.30E+03	4.53E-03	4.53E-09

NOTES:

(a) "B" in the Data Qualifies column indicates that the constituent was identified in the waste samples' corresponding analytical method blank.

"J" in the Data Qualifier column indicates that the concentration of a constituent is an estimate only. The constituent is confirmed present, but the concentration is at or below the analytical laboratory's limit of quantitation.

(b) These constituents have been confirmed to be present as the result of analytical laboratory contamination. Therefore, they have not been included in the risk screening

(c) This sample was a field blank. The water never contacted asphalt/soil or equipment contaminated with asphalt soil

(d) Insufficient toxicological data exists for phenanthrene to develop a SAL. The SAL for phenanthrene's analogue, anthracene, was used for this analysis.

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WASTE PROFILE FORM

Contact (if other than given below)	For rapid processing, complete all sections in black or blue ink and mail to: EM-SWO at MS J595. For assistance with completing this form, call EM-SWO at 5-4000.	Reference Number — (For EM-SWO use only)

Generator's Z Number	Waste Generator's Name (print)	WMC's Z Number	WMC's Name (print)
097730	Gerry Vozzey	100681	Susan S. Ramsey

Generator's Telephone	Generator's Mail Stop	Waste Generating Group	Waste Stream Technical Area	Building	Room
5-3948	ES11	NMT-2	55	PF3	134

Waste Accumulation (Check only one.)
- ☐ Satellite Accumulation Area — Site no: ____
- ☐ Less-than-90-days Storage Area — Site no: ____
- ☐ TSDF — Site no: ____
- ☐ Universal Waste Storage Area — Site no: ____
- ■ None of the Above

ER Use Only ☐ ER Site — PRS #: ____

Method of Characterization (Check as many as apply.)
- ☑ Analysis/Documents Attached
- ☐ Chemical/Physical Analysis — Sample #: ____
- ☐ Radiological Analysis — Sample #: ____
- ☐ PCB Analysis — Sample #: ____
- ☐ Acceptable Knowledge Documentation — Documentation #: ____
- ☑ MSDS

Section 1 - Chemical and Physical Information

Waste Type (Check only one.)
- ☑ Unused/Unspent Chemical (Complete all sections as appropriate.)
- ☐ Process Waste/Spent Chemical/ other (Complete all sections.)
- ☐ Green is Clean Waste (Complete all sections as appropriate.)

Waste Classes

Radiological Information
Was Waste Generated in a RCA? ☐ Yes ☑ No
- ☑ Non-radioactive
- ☐ Radioactive
  - ☐ Low-Level
  - ☐ Transuranic

Wastewater Information
- ☐ Wastewater for SWSC (TA-46) (Complete Attachment 1)
- ☐ Wastewater for RLWTF (TA-50/TA-21) (Complete Attachment 2)
- ☐ Wastewater for TA-16 (HE)

Classification Information
- ☑ Unclassified
- ☐ Classified/Sensitive

Waste Category (Check as many as apply.)
- ☑ Inorganic
- ☑ Organic * CRS 8/21/98
  - Volatile Organics ☐ < 500 ppm ☐ ≥ 500 ppm
- ☐ Solvent *
- ☐ Degreaser *
- ☐ Dioxin
- ☐ Electroplating
- ☐ Treated Hazardous waste residue
- ☐ Explosive process
- ☐ Infectious/Medical
- ☐ Biological
- ☐ Beryllium
- ☐ Empty Container (See instructions)
- ☐ Battery (See instructions)
- Asbestos ☐ friable ☐ non-friable
- PCB Source Concentration
  - ☐ PCB < 50 ppm
  - ☐ PCB ≥ 50 - < 500 ppm
  - ☐ PCB ≥ 500 ppm
  - ☐ Other (Describe below)

* Concentrations 10% or greater before use.

Waste Source (Check only one.)

Routine Waste
- ☐ Decon
- ☐ Materials Processing/Production
- ☑ Research/Development/Testing
- ☐ Scheduled Maintenance
- ☐ Housekeeping - Routine
- ☐ Spill Cleanup - Routine
- ☐ Sampling - Routine Monitoring
- ☐ Other (Describe below)

Non-routine Waste
- ☐ Abatement
- ☐ Construction/Upgrades
- ☐ Demolition
- ☐ Decon/Decom
- ☐ Investigative Derived
- ☐ Orphan/Legacy
- ☐ Remediation/Restoration
- ☐ Repacking (Secondary)
- ☐ Unscheduled Maintenance
- ☐ Housekeeping - Non-routine
- ☐ Spill Cleanup - Non-routine
- ☐ UST - Non-petroleum
- ☐ UST - Petroleum
- ☐ Other (Describe below)

Waste Matrix (Check only one.)

Gas
- ☐ ≤ 1.5 Atmospheres pressure
- ☐ > 1.5 Atmospheres pressure
- ☐ Liquefied compressed gas

Liquid
- ☐ Aqueous
- ☐ Non-aqueous
- ☐ Suspended Solids/ Aqueous
- ☐ Suspended Solids/ Non-aqueous

Solid
- ☑ Powder/Ash
- ☐ Solid
- ☐ Sludge
- ☐ Absorbed liquid

Matrix Type (Check only one.)
- ☑ Homogeneous
- ☐ Heterogeneous (Describe below)

Waste/Process Description (Chemical formulas may be used in this field.) CRS 8/21/98

Fly ash obtained to conduct experiments on developing a cement-based waste form w/ various waste streams ~~Not used in any experiments~~

Fly Ash is >>mostly silica glass w/ <5 wt% unburned carbon. Product of burning of coal in power plants. CRS 8/21/98

NOT USED IN ANY EXPERIMENTS. A GENERIC ("SURROGATE") MSDS IS ATTACHED.

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WASTE PROFILE FORM

NFPA Fire = 1

Section 2 - Characteristics

Ignitability (Check only one.) (°F)	(°C)	Corrosivity (Check only one.) (pH)	Reactivity (Check as many as apply.)	Boiling Point (Check only one) (°F)	(°C)
☐ < 73	< 22.8	☐ ≤ 2.0	☐ RCRA Unstable	☐ ≤ 95	≤ 35
☐ 73 - 99	22.8 - 37.2	☐ 2.1 - 4.0	☐ Water Reactive	☐ > 95	> 35
☐ 100 - 139	37.8 - 59.4	☐ 4.1 - 6.0	☐ Cyanide Bearing (> 250 ppm)		
☐ 140 -200	60.0 - 99.3	☐ 6.1 - 9.0	☐ Sulfide Bearing (> 500 ppm)		
☑ > 200	> 99.3	☐ 9.1 - 12.4	☐ Pyrophoric		
☐ EPA Ignitable - Non-liquid		☐ ≥ 12.5	☐ Shock Sensitive		
☐ DOT Flammable Gas		☐ Liquid corrosive to steel	☐ Explosive - DOT Div. _____		
☐ DOT Oxidizer					
☐ Not ignitable		☑ Non-aqueous	☑ Non-reactive	☑ Not applicable	

Identify for all contaminants listed.	Characterization Method: AK	TCLP	Total	Concentration of Contaminants: None or Non-detect	Present Below Regulatory Limit	Above Regulatory Limit (Concentration in ppm only.) Minimum	Maximum
Toxicity Characteristic Metals							
Arsenic	☑	☐	☐	☑	☐ < 5.0 ppm	_____ to	_____ ppm
Barium	☐	☐	☐	☐	☐ < 100.0 ppm	_____ to	_____ ppm
Cadmium	☐	☐	☐	☐	☐ < 1.0 ppm	_____ to	_____ ppm
Chromium (Total)	☐	☐	☐	☐	☐ < 5.0 ppm	_____ to	_____ ppm
Lead	☐	☐	☐	☐	☐ < 5.0 ppm	_____ to	_____ ppm
Mercury	☐	☐	☐	☐	☐ < 0.2 ppm	_____ to	_____ ppm
Selenium	☐	☐	☐	☐	☐ < 1.0 ppm	_____ to	_____ ppm
Silver	☐	☐	☐	☐	☐ < 5.0 ppm	_____ to	_____ ppm
Toxicity Characteristic Organics							
Benzene	☐	☐	☐	☑	☐ < 0.5 ppm	_____ to	_____ ppm
Carbon tetrachloride	☐	☐	☐	☐	☐ < 0.5 ppm	_____ to	_____ ppm
Chlorodane	☐	☐	☐	☐	☐ < 0.03 ppm	_____ to	_____ ppm
Chlorobenzene	☐	☐	☐	☐	☐ < 100.0 ppm	_____ to	_____ ppm
Chloroform	☐	☐	☐	☐	☐ < 6.0 ppm	_____ to	_____ ppm
o - cresol	☐	☐	☐	☐	☐ < 200.0 ppm	_____ to	_____ ppm
m - cresol	☐	☐	☐	☐	☐ < 200.0 ppm	_____ to	_____ ppm
p - cresol	☐	☐	☐	☐	☐ < 200.0 ppm	_____ to	_____ ppm
Cresol - mixed	☐	☐	☐	☐	☐ < 200.0 ppm	_____ to	_____ ppm
2,4-D	☐	☐	☐	☐	☐ < 10.0 ppm	_____ to	_____ ppm
1,4-Dichlorobenzene	☐	☐	☐	☐	☐ < 7.5 ppm	_____ to	_____ ppm
1,2-Dichloroethane	☐	☐	☐	☐	☐ < 0.5 ppm	_____ to	_____ ppm
1,1-Dichloroethylene	☐	☐	☐	☐	☐ < 0.7 ppm	_____ to	_____ ppm
2,4-Dinitrotoluene	☐	☐	☐	☐	☐ < 0.13 ppm	_____ to	_____ ppm
Endrin	☐	☐	☐	☐	☐ < 0.02 ppm	_____ to	_____ ppm
Heptachlor (& its epoxide)	☐	☐	☐	☐	☐ < 0.008 ppm	_____ to	_____ ppm
Hexchlorobenzene	☐	☐	☐	☐	☐ < 0.13 ppm	_____ to	_____ ppm
Hexchlorobutadiene	☐	☐	☐	☐	☐ < 0.5 ppm	_____ to	_____ ppm
Hexchloroethane	☐	☐	☐	☐	☐ < 3.0 ppm	_____ to	_____ ppm
Lindane	☐	☐	☐	☐	☐ < 0.4 ppm	_____ to	_____ ppm
Methoxychlor	☐	☐	☐	☐	☐ < 10.0 ppm	_____ to	_____ ppm
Methyl ethyl ketone	☐	☐	☐	☐	☐ < 200.0 ppm	_____ to	_____ ppm
Nitrobenzene	☐	☐	☐	☐	☐ < 2.0 ppm	_____ to	_____ ppm
Pentachlorophenol	☐	☐	☐	☐	☐ < 100.0 ppm	_____ to	_____ ppm
Pyridine	☐	☐	☐	☐	☐ < 5.0 ppm	_____ to	_____ ppm
Tetrachloroethylene	☐	☐	☐	☐	☐ < 0.7 ppm	_____ to	_____ ppm
Toxaphene	☐	☐	☐	☐	☐ < 0.5 ppm	_____ to	_____ ppm
Trichloroethylene	☐	☐	☐	☐	☐ < 0.5 ppm	_____ to	_____ ppm
2,4,5-Trichlorophenol	☐	☐	☐	☐	☐ < 400.0 ppm	_____ to	_____ ppm
2,4,6-Trichlorophenol	☐	☐	☐	☐	☐ < 2.0 ppm	_____ to	_____ ppm
2,4,5-TP (Silvex)	☐	☐	☐	☐	☐ < 1.0 ppm	_____ to	_____ ppm
Vinyl chloride	☑	☐	☐	☐	☐ < 0.2 ppm	_____ to	_____ ppm

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WASTE PROFILE FORM

Section 3 - Additional Constituents

Additional Constituents and Contaminates. Please account for 100% of waste. Ranges should be given within guidelines of LIG 404-00-03 of individual constituents. List all other constituents (including inerts) not identified above and attach any applicable analysis. No chemical formulas allowed in this field. Continue in Section 3 Additional Information as necessary. CAS Numbers are needed for all chemical constituents. for material without a CAS Number enter "No CAS Number." Contact Waste Services at 5-4000 for assistance

CAS No.	Name of constituent	Minimum		Maximum	
81131-74-4	Fly Ash	25	to	[illegible]	%
14808-60-7	Quartz	[illegible]	to	[illegible]	%
NO CAS NUMBER	UNBURNED CARBON	[illegible]	to	5	%
			to		%
			to		%
			to		%
			to		%
			to		%
			to		%
			to		%
			to		%
			to		%
	Total of max. ranges of this section	105			in %
	Total of max. ranges from page 2.	[illegible]			in ppm

Additional Information (Use additional sheet if necessary.)

If additional information is available on the chemical, physical, or radiological character of the waste not covered on this form, provide it below:

WASTE GENERATOR CERTIFICATION: Based on my knowledge of the waste and/or chemical/physical analysis, I certify that the information on this form is correct. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Signature [signature] Date 6/2/98

WASTE MANAGEMENT COORDINATOR: I have reviewed this form and to the best of my knowledge, the information is complete and accurate.

Signature Date

MSDS: FLY ASH

SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MDL INFORMATION SYSTEMS, INC.
14600 CATALINA STREET
SAN LEANDRO, CA 94577
1-800-738-4765 OR
1-615-366-2000

EMERGENCY TELEPHONE NUMBER:
1-800-424-9300 (NORTH AMERICA)
1-703-527-3887 (INTERNATIONAL)

SUBSTANCE: FLY ASH

TRADE NAMES/SYNONYMS:
COAL ASH; ASHES (RESIDUES); OHS88307; GF8285000

CREATION DATE: Apr 16 1987
REVISION DATE: Jun 30 1997

SECTION 2 COMPOSITION, INFORMATION ON INGREDIENTS

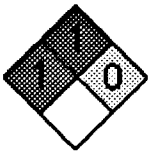
COMPONENT: FLY ASH
CAS NUMBER: 68131-74-8
EC NUMBER (EINECS): 268-627-4
PERCENTAGE: <99.0

COMPONENT: QUARTZ
CAS NUMBER: 14808-60-7
EC NUMBER (EINECS): 238-878-4
PERCENTAGE: >1.0

SECTION 3 HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=1 FIRE=1 REACTIVITY=0

EC CLASSIFICATION (CALCULATED): No classification assigned.



EMERGENCY OVERVIEW:
COLOR: black
PHYSICAL FORM: solid
MAJOR HEALTH HAZARDS: cancer hazard (in humans)
PHYSICAL HAZARDS: Dust/air mixtures may ignite or explode.

POTENTIAL HEALTH EFFECTS:
INHALATION:
SHORT TERM EXPOSURE: irritation, lung damage.
LONG TERM EXPOSURE: difficulty breathing, bluish skin color, lung damage,

cancer.
SKIN CONTACT:
SHORT TERM EXPOSURE: irritation.
LONG TERM EXPOSURE: no information on significant adverse effects.
EYE CONTACT:
SHORT TERM EXPOSURE: irritation.
LONG TERM EXPOSURE: no information on significant adverse effects.
INGESTION:
SHORT TERM EXPOSURE: no information on significant adverse effects.
LONG TERM EXPOSURE: no information is available.

CARCINOGEN STATUS:
OSHA: N
NTP: Y
IARC: Y

SECTION 4 FIRST AID MEASURES

INHALATION: Remove from exposure immediately. Use a bag valve mask or similar device to perform artificial respiration (rescue breathing) if needed. Get medical attention.

SKIN CONTACT: Remove contaminated clothing, jewelry, and shoes immediately. Wash with soap or mild detergent and large amounts of water until no evidence of chemical remains (at least 15-20 minutes). Get medical attention, if needed.

EYE CONTACT: Wash eyes immediately with large amounts of water or normal saline, occasionally lifting upper and lower lids, until no evidence of chemical remains. Get medical attention immediately.

INGESTION: If vomiting occurs, keep head lower than hips to help prevent aspiration. Get medical attention, if needed.

SECTION 5 FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Slight fire hazard. Dust/air mixtures may ignite or explode.

EXTINGUISHING MEDIA: regular dry chemical, carbon dioxide, water, regular foam

Large fires: Use regular foam or flood with fine water spray.

FIREFIGHTING: Move container from fire area if it can be done without risk. Do not scatter spilled material with high-pressure water streams. Dike for later disposal. Use extinguishing agents appropriate for surrounding fire. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.

FIREFIGHTING PROTECTIVE EQUIPMENT: Full firefighting turn-out gear (bunker gear). Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply. Any self-contained breathing apparatus with a full

facepiece.

SECTION 6 ACCIDENTAL RELEASE MEASURES

WATER RELEASE:
Subject to California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). Keep out of water supplies and sewers.

OCCUPATIONAL RELEASE:
Collect spilled material in appropriate container for disposal. Keep out of water supplies and sewers. Keep unnecessary people away, isolate hazard area and deny entry.

SECTION 7 HANDLING AND STORAGE

Store and handle in accordance with all current regulations and standards. Store in a tightly closed container. Keep separated from incompatible substances.

SECTION 8 EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:
QUARTZ:
0.1 mg/m3 OSHA TWA (respirable particulate)
0.3 mg/m3 OSHA TWA (total particulate)
0.1 mg/m3 ACGIH TWA (respirable particulate)
0.05 mg/m3 NIOSH recommended TWA 10 hour(s) (respirable particulate)
0.15 mg/m3 DFG MAK (fine dust)

MEASUREMENT METHOD: Particulate filter; Low-temperature ashing; X-ray diffraction spectrometry; NIOSH III # 7500

VENTILATION: Provide local exhaust ventilation system. Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Ensure compliance with applicable exposure limits.

EYE PROTECTION: Wear splash resistant safety goggles. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: Wear appropriate chemical resistant clothing.

GLOVES: Wear appropriate chemical resistant gloves.

RESPIRATOR: Under conditions of frequent use or heavy exposure, respiratory protection may be needed. Respiratory protection is ranked in order from minimum to maximum. Consider warning properties before use.
Any dust, mist, and fume respirator.
Any air-purifying respirator with a high-efficiency particulate filter.

Any powered, air-purifying respirator with a dust, mist, and fume filter.
Any powered, air-purifying respirator with a high-efficiency particulate filter.

For Unknown Concentrations or Immediately Dangerous to Life or Health -
Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.
Any self-contained breathing apparatus with a full facepiece.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: solid
COLOR: black
TEXTURE: granular
ODOR: Not available
BOILING POINT: Not applicable
MELTING POINT: Not available
VAPOR PRESSURE: Not applicable
VAPOR DENSITY: Not applicable
SPECIFIC GRAVITY (water=1): >1
WATER SOLUBILITY: 0.5%
PH: Not applicable
VOLATILITY: Not applicable
ODOR THRESHOLD: Not available
EVAPORATION RATE: Not applicable
COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available

SECTION 10 STABILITY AND REACTIVITY

REACTIVITY: Stable at normal temperatures and pressure.

CONDITIONS TO AVOID: Avoid heat, flames, sparks and other sources of ignition. Avoid contact with incompatible materials.

INCOMPATIBILITIES: oxidizing materials, bases, halogens, acids, metal salts, metals, combustible materials

FLY ASH:
OXIDIZERS (STRONG): Fire and explosion hazard.

QUARTZ:
ALKALIES (STRONG): May be attacked.
CHLORINE TRIFLUORIDE: Possible explosion.
HYDROCHLORIC ACID: Exothermic reaction.
HYDROFLUORIC ACID: May be attacked.
MANGANESE TRIFUORIDE: Violent reaction.
METALS: May produce violent explosion.
OXIDIZERS (STRONG): Fire and explosion hazard.
OXYGEN TRIFUORIDE: Possible explosive reaction.
OZONE: Possible explosive reaction in presence of organic materials.
VINYL ACETATE: Vigorous reaction.
XENON HEXAFLUORIDE: Possible detonation.

HAZARDOUS DECOMPOSITION: Thermal decomposition products: miscellaneous decomposition products.

POLYMERIZATION: Will not polymerize.

SECTION 11 TOXICOLOGICAL INFORMATION

FLY ASH:
TOXICITY DATA:
270 mg/m3/6 hour(s)-15 day(s) intermittent inhalation-rat TCLo; 30 mg/m3/6 hour(s)-4 week(s) intermittent inhalation-rat TCLo; 350 mg/kg/7 day(s) intermittent intratracheal-rat TDLo; 2 mg/kg/20 hour(s)-26 week(s) intermittent inhalation-hamster TCLo.
TUMORIGENIC DATA:
5 mg/m3 inhalation-mouse TDLo/7 hour(s)-21 week(s) intermittent.
MUTAGENIC DATA:
mutation in microorganisms - Salmonella typhimurium 1800 ug/plate (+/-S9); mutation in microorganisms - other microorganisms 535 mg/L (+S9); sister chromatid exchange - human lymphocyte 10 mg/L.
REPRODUCTIVE EFFECTS DATA:
600 mg/kg intratracheal-rat TDLo 14-19 day(s) pregnant female continuous.

FLY ASH:
TOXICITY DATA:
270 mg/m3/6 hour(s)-15 day(s) intermittent inhalation-rat TCLo; 30 mg/m3/6 hour(s)-4 week(s) intermittent inhalation-rat TCLo; 350 mg/kg/7 day(s) intermittent intratracheal-rat TDLo; 2 mg/kg/20 hour(s)-26 week(s) intermittent inhalation-hamster TCLo.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: respiratory disorders.
TUMORIGENIC DATA:
5 mg/m3 inhalation-mouse TDLo/7 hour(s)-21 week(s) intermittent.
MUTAGENIC DATA:
mutation in microorganisms - Salmonella typhimurium 1800 ug/plate (+/-S9); mutation in microorganisms - other microorganisms 535 mg/L (+S9); sister chromatid exchange - human lymphocyte 10 mg/L.
REPRODUCTIVE EFFECTS DATA:
600 mg/kg intratracheal-rat TDLo 14-19 day(s) pregnant female continuous.

QUARTZ:
TOXICITY DATA:
16 mppcf/8 hour(s)-17.9 year(s) intermittent inhalation-human TCLo; 300 ug/m3/10 year(s) intermittent inhalation-human LCLo; 90 mg/kg intravenous-rat LDLo; 200 mg/kg intratracheal-rat LDLo; 40 mg/kg intravenous-mouse LDLo; 20 mg/kg intravenous-dog LDLo; 80 mg/m3/26 week(s) intermittent inhalation-rat TCLo; 108 mg/m3/6 hour(s)-3 day(s) intermittent inhalation-rat TCLo; 58 mg/m3/13 week(s) intermittent inhalation-rat TCLo; 1475 ug/m3/8 hour(s)-21 week(s) intermittent inhalation-mouse TCLo; 4932 ug/m3/24 hour(s)-39 week(s) continuous inhalation-mouse TCLo; 28 mg/m3/3 week(s) intermittent inhalation-guinea pig TCLo.
CARCINOGEN STATUS: NTP: Anticipated Human Carcinogen; IARC: Human Limited Evidence, Animal Sufficient Evidence, Group 1; EC: Category 2. Adenocarcinomas and squamous-cell carcinomas of the lung in rats were produced after inhalation or repeated intratracheal instillation of various forms of crystalline silica. Malignant lymphomas developed in rats after intrapleural and intraperitoneal injections of quartz suspensions and intrapleural injection of cristobalite and tridymite. Epidemiologic studies indicate lung cancer occurs more frequently among silicotics than in the general population.
ACUTE TOXICITY LEVEL: Insufficient Data.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: respiratory disorders.
TUMORIGENIC DATA:
50 mg/m3 inhalation-rat TCLo/6 hour(s)-71 week(s) intermittent; 45 mg/kg intraperitoneal-rat TDLo; 90 mg/kg intravenous-rat TDLo; 90 mg/kg intrapleural-rat TDLo; 111 mg/kg intratracheal-rat TDLo; 100 mg/kg intratracheal-rat TDLo/19 week(s) intermittent; 900 mg/kg implant-rat TDLo; 4000 mg/kg implant-mouse TDLo; 83 mg/kg intrapleural-hamster TDLo; 90 mg/kg intraperitoneal-rat TD/4 week(s) intermittent; 450 mg/kg intraperitoneal-rat TD/4 week(s) intermittent; 4554 mg/kg implant-rat TD; 200 mg/kg intrapleural-rat TD; 100 mg/kg intrapleural-rat TD; 100 mg/kg intrapleural-rat TD; 100 mg/kg intrapleural-rat TD.
MUTAGENIC DATA:
micronucleus test - human lung 40 ug/cm2; micronucleus test - hamster lung 160 ug/cm2.
ADDITIONAL DATA: Smoking may enhance the toxic effects.

HEALTH EFFECTS:
INHALATION:
ACUTE EXPOSURE:
FLY ASH: Dust may cause coughing, sneezing, upper respiratory tract irritation, and lung damage.

QUARTZ: Exposure to high concentrations may cause physical discomfort of the upper respiratory tract.

CHRONIC EXPOSURE:
FLY ASH: Workers exposed for over 10 years showed reduced lung capacity with heavy exposure. Similar effects were seen in a study of guinea pigs exposed for 5 days; recovery occurred following cessation of exposure. In a separate study, high alkaline content was deemed responsible for the reduced lung capacity. Exposure of hamsters to fly ash for 2 months resulted in dark discoloration of the lungs with slow lung clearance. Inhalation induces macrophage response in the lungs and alters lung and hepatic lipids. Rats exposed for 15 days (6 hr/day) showed inhibited pulmonary and hepatic NADH-oxidase activity. Intratracheal administration in pregnant rats caused adverse effects on fetal growth.

QUARTZ: Inhalation of very high concentrations of finely divided crystalline silica dust, exposure ranging from a few weeks to 4-5 years, may cause a rapidly developing silicosis, characterized by pulmonary insufficiency with severe dyspnea, violent coughing, tachypnea, weight loss, and cyanosis leading to the development of cor pulmonale and death within a relatively short period of time. A slowly developing silicosis may result from exposure for 6 months-30 years to relatively low levels of the dust. The first symptom is usually a slowly increasing, non-disabling, exertional dyspnea due to pulmonary fibrosis and the emphysema associated with it. Continued exposure may increase the rate of progression of the disease. Also, the fibrogenic action may continue when exposure ceases. As the fibrosis advances, other symptoms may include shortness of breath, productive cough, wheezing, chest tightness or pain, marked weakness, decreased capacity for work, and repeated non-specific chest illnesses. Cyanosis, clubbing of digits, orthopnea, or serious weight loss are not usually evident until the disease is advanced. Pulmonary infections, which may be indicated by hemoptysis, and cardiac decompensation may exacerbate the symptoms. Three major complications, which are the most frequent causes of death, are pulmonary tuberculosis, respiratory insufficiency which is due to the massive emphysematous and fibrotic changes and is sometimes accompanied by chronic cor pulmonale, and acute bronchopulmonary infection. A number of studies have shown that persons diagnosed as having silicosis have an increased risk for dying from lung cancer. This increase has been seen among miners, quarry workers, foundry workers, ceramic workers, granite workers, and stone cutters. In some of these studies, the risk of lung

cancer increased with the duration of employment. Various forms and preparations of crystalline silica produced adenocarcinomas and squamous cell carcinomas of the lungs in rats.

SKIN CONTACT:
ACUTE EXPOSURE:
FLY ASH: No data available.

QUARTZ: May cause irritation of intact skin due to mechanical abrasion. If the skin is abraded, a heavy growth of scar tissue may be induced.

CHRONIC EXPOSURE:
FLY ASH: A cohort study of workers showed fly ash containing chromium, nickel and cobalt has an irritant and allergic potential.

QUARTZ: No data available.

EYE CONTACT:
ACUTE EXPOSURE:
FLY ASH: May cause irritation. Marginal blepharitis and conjunctivitis appeared within 3 to 5 days of intraconjunctival application of fly ash.

QUARTZ: May cause irritation due to mechanical action. Particles of silica in the range of 2-3 micrometers introduced into the corneal stroma of rabbit eyes caused very little reaction. These same particles introduced into the anterior chamber resulted in an inflammatory reaction in 3-5 weeks with the formation of fibrotic nodules in the iridocorneal angle. Finely divided silica injected into the vitreous of rabbit eyes has caused necrosis of the retina and atrophy of the choroid.

CHRONIC EXPOSURE:
FLY ASH: No data available.

QUARTZ: An abnormally high silicon content in the cornea, and a gradual decrease in visual acuity due to corneal opacities in the pupillary area, have been reported in a group of foundry workers.

INGESTION:
ACUTE EXPOSURE:
FLY ASH: No data available.

QUARTZ: Effects of ingestion are due to mechanical action as crystalline silicas are biologically inert.

CHRONIC EXPOSURE:
FLY ASH: No data available.

QUARTZ: No data available.

SECTION 12 ECOLOGICAL INFORMATION

Not available.

SECTION 13 DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations.

SECTION 14 TRANSPORT INFORMATION

No classification assigned.

SECTION 15 REGULATORY INFORMATION

U.S. REGULATIONS:
  TSCA INVENTORY STATUS: Y

  TSCA 12(b) EXPORT NOTIFICATION: Not listed.
  CERCLA SECTION 103 (40CFR302.4): N
  SARA SECTION 302 (40CFR355.30): N
  SARA SECTION 304 (40CFR355.40): N
  SARA SECTION 313 (40CFR372.65): N
  SARA HAZARD CATEGORIES, SARA SECTIONS 311/312 (40CFR370.21):
    ACUTE: N
    CHRONIC: Y
    FIRE: N
    REACTIVE: N
    SUDDEN RELEASE: N
  OSHA PROCESS SAFETY (29CFR1910.119): N
STATE REGULATIONS:
  CALIFORNIA PROPOSITION 65: Y
    QUARTZ
EUROPEAN REGULATIONS:
  EC NUMBER (EINECS): 268-627-4

SECTION 16 OTHER INFORMATION

MSDS SUMMARY OF CHANGES

SECTION 1	CHEMICAL PRODUCT AND COMPANY IDENTIFICATION
SECTION 2	COMPOSITION, INFORMATION ON INGREDIENTS
SECTION 3	HAZARDS IDENTIFICATION
SECTION 5	FIRE FIGHTING MEASURES
SECTION 8	EXPOSURE CONTROLS, PERSONAL PROTECTION
SECTION 9	PHYSICAL AND CHEMICAL PROPERTIES
SECTION 10	STABILITY AND REACTIVITY
SECTION 11	TOXICOLOGICAL INFORMATION
SECTION 12	ECOLOGICAL INFORMATION
SECTION 14	TRANSPORT INFORMATION
SECTION 15	REGULATORY INFORMATION

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Land Disposal Restriction (LDR) and Underlying Hazardous Constituents Information Form

Associated WPF Reference Number _____

LDR and Underlying Hazardous Constituents Information - Identify presence of any constituents listed below.

Non-Wastewater / Wastewater Category - Check only one.

☒ Non Wastewater ☐ Wastewater [as defined by 40 CFR 268.2(f)]

Notification of California List Applicability - Check all that apply.

☐ Liquid hazardous waste containing PCBs at a concentration of 50 ppm or greater.

☐ A D001 thru D043 liquid waste containing 134 mg/L or greater of Nickel and/or 130 mg/L or greater of thallium.

☐ A D001 thru D043 waste containing Halogenated Organic Compounds (HOCs) listed in 40 CFR 268, Appendix III, at 1000 ppm or greater.

Notification Of Underlying Hazardous Constituents

(Check the applicable underlying constituents above the concentration levels for D001, D002, D003, and D012 - D043 characteristic wastes only)

☒ *No Underlying Hazardous Constituents in this waste stream.*

Organic Constituents

☐ A2213	☐ Butyl benzyl phthalate	☐ p,p'-DDE
☐ Acenaphthylene	☐ 2-sec-Butyl-4,6-dinitrophenol (Dinoseb)	☐ o,p'-DDT
☐ Acenaphthene	☐ Carbaryl	☐ p,p'-DDT
☐ Acetone	☐ Carbenzadim	☐ Dibenz(a,h)anthracene
☐ Acetonitrile	☐ Carbofuran	☐ Dibenz(a,e)pyrene
☐ Acetophenone	☐ Carbofuran phenol	☐ 1,2-Dibromo-3-chloropropane
☐ 2-Acetyaminofluorene	☐ Carbon disufide	☐ 1,2-Dibromoethane (Ethylene dibromide)
☐ Acrolein	☐ Carbon tertachloride	☐ Dibromomethane
☐ Acrylamide	☐ Carbosulfan	☐ m-Dichlorobenzene
☐ Acrylonitrile	☐ Chlordane (alpha & gamma isomers)	☐ o-Dichlorobenzene
☐ Aldicarb sulfone	☐ p-Chloroaniline	☐ p-Dichlorobenzene
☐ Aldrin	☐ Chlorobenzene	☐ Dichlorodifluoromethane
☐ 4-Aminobiphenyl	☐ Chlorobenzilate	☐ 1,1-Dichloroethane
☐ Aniline	☐ 2-Chlor-1,3-butadiene	☐ 1,2-Dichloroethane
☐ Anthracene	☐ Chlorodibromomethane	☐ 1,1-Dichloroethylene
☐ Aramite	☐ Chloroethane	☐ trans-1,2-Dichloroethylene
☐ alpha-BHC	☐ bis(2-chloroethoxy) methane	☐ 2,4-Dichlorophenol
☐ beta-BHC	☐ bis(2-chloroethyl) ether	☐ 2,6-Dichlorophenol
☐ delta-BHC	☐ Chloroform	☐ 2,4-Dichlorophenoxyacetic (2,4-D)
☐ gamma-BHC	☐ bis(2-chloroisopropyl) ether	☐ 1,2-Dichloropropane
☐ Barban	☐ p-Chloro-m-cresol	☐ cis-1,3-Dichloropylene
☐ Bendiocarb	☐ 2-Chloroethyl vinyl ether	☐ trans-1,3-Dichloropylene
☐ Bendiocarb phenol	☐ Chloromethane (Methyl chloride)	☐ Dieldrin
☐ Benomyl	☐ 2-Chloronaphthalene	☐ Diethylene glycol, dicarbamate
☐ Benzene	☐ 2-Chlorophenol	☐ Diethyl phthalate
☐ Benz(a)anthracene	☐ 2-Chloropropylene	☐ p-Dimethylaminoazobenzene
☐ Benzal chloride	☐ Chrysene	☐ 2-4-Dimethyl phenol
☐ Benzo(b)fluoranthene	☐ o-Cresol	☐ Dimethyl phthalate
☐ Benzo(k)fluoranthene	☐ m-Cresol	☐ Dimetilan
☐ Benzo(g,h,i)perylene	☐ p-Cresol	☐ Di-n-butyl phthalate
☐ Benzo(a)pyrene	☐ m-Cumenyl methylcarbamate	☐ 1,4-Dinitrobenzene
☐ Bromodichloromethane	☐ Cycloate	☐ 4,6-Dinitro-o-cresol
☐ Bromomethane (Methyl bromide)	☐ Cyclohexanone	☐ 2,4-Dinitrophenol
☐ 4-Bromophenyl phenyl ether	☐ o,p'-DDD	☐ 2,4-Dinitrotoluene
☐ n-Butyl alcohol	☐ p,p'-DDD	☐ 2,6-Dinitrotoluene
☐ Butylate	☐ o,p'-DDE	☐ Di-n-octyl phthalate

Land Disposal Restriction (LDR) and Underlying Hazardous Constituents Information Form

Notification Of Underlying Hazardous Constituents

(Check the applicable underlying constituents above the concentration levels for D001, D002, D003, and D012 - D043 characteristic wastes only)

Metal/Inorganic Constituents

☐ Antimony	☐ Cyanides (Amenable)	☐ Selenium
☐ Arsenic	☐ Fluoride	☐ Silver
☐ Barium	☐ Lead	☐ Sulfide
☐ Beryllium	☐ Mercury (Retort residues)	☐ Thallium
☐ Cadmium	☐ Mercury - All others	☐ Vanadium
☐ Chromium (Total)	☐ Nickel	☐ Zinc
☐ Cyanides (Total)		

TA-3, Bldg 29, 9010

CMR

STTP Test Vessel Loading Data from WCRRF

Waste Container ID Number			Test Vessel ID Number
55107	F005	NON HALOGENATED SOLVENTS	1
	F002	HALOGENATED SOLVENTS	
	F001	HALOGENATED SOLVENTS	
	D007	CHROMIUM	
	D009	MERCURY	
	D008	LEAD	
55110	F001	HALOGENATED SOLVENTS	2
	D007	CHROMIUM	
	F005	NON HALOGENATED SOLVENTS	
	F002	HALOGENATED SOLVENTS	
	D008	LEAD	
	D009	MERCURY	
54066	D008	LEAD (SHIELDING)	3
	D008	LEAD	
	D007	CHROMIUM	
	D006	CADMIUM	
55054			4
5131A4			5
5122A7			6
5133-P8B			7
53822	D008	LEAD (SHIELDING)	8
	D007	CHROMIUM	
	D008	LEAD	
	D006	CADMIUM	
53720	D008	LEAD (SHIELDING)	9
	D007	CHROMIUM	
	D006	CADMIUM	
	D008	LEAD	
55111	F001	HALOGENATED SOLVENTS	10
	D009	MERCURY	
	D008	LEAD	
	D007	CHROMIUM	
	F002	HALOGENATED SOLVENTS	
	F005	NON HALOGENATED SOLVENTS	
53754	D008	LEAD (SHIELDING)	11
	D006	CADMIUM	
	D008	LEAD	
	D007	CHROMIUM	
54029	D008	LEAD (SHIELDING)	13
	D006	CADMIUM	
	D007	CHROMIUM	
	D008	LEAD	
3122A			14
31241A			15
31241B			16
5133Y8			17

	5133P8-A		18
	5133U3		19
	XBRCW198E		20
	XBRCW199E		21
	XBRCW200E		22
	XBRCW201E		23
	SLTFB3117A		25
	SLTFB3123A		26
55105	F001	HALOGENATED SOLVENTS	27
	F005	NON HALOGENATED SOLVENTS	
	D008	LEAD	
	D009	MERCURY	
	D007	CHROMIUM	
	F002	HALOGENATED SOLVENTS	
55108	F001	HALOGENATED SOLVENTS	28
	F002	HALOGENATED SOLVENTS	
	D007	CHROMIUM	
	D009	MERCURY	
	D008	LEAD	
	F005	NON HALOGENATED SOLVENTS	
55102	F001	HALOGENATED SOLVENTS	29
	F002	HALOGENATED SOLVENTS	
	D007	CHROMIUM	
	F005	NON HALOGENATED SOLVENTS	
	D009	MERCURY	
	D008	LEAD	
55101	F001	HALOGENATED SOLVENTS	30
	F002	HALOGENATED SOLVENTS	
	D007	CHROMIUM	
	D008	LEAD	
	F005	NON HALOGENATE SOLVENTS	
	D009	MERCURY	
55109	F001	HALOGENATED SOLVENTS	31
	D007	CHROMIUM	
	D008	LEAD	
	F005	NON HALOGENATED SOLVENTS	
	F002	HALOGENATED SOLVENTS	
	D009	MERCURY	
55104	F001	HALOGENATED SOLVENTS	32
	D009	MERCURY	
	F002	HALOGENATED SOLVENTS	
	F005	NON HALOGENATED SOLVENTS	
	D008	LEAD	
	D007	CHROMIUM	
	SLTFB3124A		33
	XBRCW197E		34
	WBRCW1807		35

Liter Scale Vessels

55112	F001	HALOGENATED SOLVENTS	High Pressure
	F005	NON HALOGENATED SOLVENTS	
	D008	LEAD	
	D007	CHROMIUM	
	D009	MERCURY	
	F002	HALOGENATED SOLVENTS	
55113	F001	HALOGENATED SOLVENTS	High Pressure
	F002	HALOGENATED SOLVENTS	
	F005	NON HALOGENATED SOLVENTS	
	D008	LEAD	
	D009	MERCURY	
	D007	CHROMIUM	
55103	F001	HALOGENATED SOLVENTS	High Pressure
	F002	HALOGENATED SOLVENTS	
	F005	NON HALOGENATED SOLVENTS	
	D009	MERCURY	
	D008	LEAD	
	D007	CHROMIUM	
3137A2			4 High Pressure
3137A1			5 High Pressure
3125A			6 High Pressure

Drum Scale Vessels

52047	F001		1
	F002		
53211	F001		2
	F002		
53565	F001		3
	F002		
54409	F001		4
	F002		
53217	F001		5
	F002		
52114	F001		6
	F002		
52878	F001		7
	F002		
54546	F001		8
	F002		
52410	F001		10
	F002		
54174	F001		11
	F002		
52896	F001		12
	F002		
54129	F001		13
	F002		
54871			14
52109	D008	LEAD	15
54371			18

LOS ALAMOS NATIONAL LABORATORY

WASTE PROFILE FORM

EM-8 USE ONLY
Reference Number 06174

Complete both sides of this form using a black or blue pen. Incomplete forms will be rejected. Send form to ATTN: WPF, MS K490.

Division/Group	Telephone	Mail Stop	Technical Area	Building	Room
EM-7	7-4301	E-518	TA-50	1	60A

Method of Characterization

- [ ] Knowledge of Process (KOP)
- [ ] MSDS attached (optional)

- OR -

- [ ] Chemical/Physical Analysis (specify below)
- [x] Request for analysis
- [x] Analysis attached

Waste Categories *(Choose one or more of the categories below that most accurately describes your waste.)*

[ ] Flammable	[ ] Pesticide	[ ] Photographic	[ ] Spent coolant	[ ] Plastics
[ ] Combustible	[ ] Beryllium	[ ] Sanitary	[ ] Aerosol cans	[ ] Filter media
[ ] High explosive	[ ] Asbestos	[ ] Radiochemistry	[ ] Motor oil	[ ] Vacuum filter media
[ ] DOT oxidizer	[ ] Solvent	[ ] Paint waste	[ ] Pump oil	[x] Cement paste
[ ] Pyrophoric	[ ] Waste rags	[ ] Laboratory trash	[ ] Capacitor oil	[ ] Nonsalvageable
[ ] Cyanide	[ ] Glass	[ ] Metallurgic	[ ] UST remediation	[ ] Nonrecyclable
[ ] Heavy metal	[ ] Plating solution	[ ] Scrap metal	[ ] Contaminated soils	[ ] Building debris
[ ] Corrosive	[ ] Etchant	[ ] Medical/Biological	[ ] Environmental/SWMU	[ ] Firing site debris

General Description *(Provide a general description of the waste and/or waste-generating process below.)*

PROCESS ACID AND CAUSTIC WASTE FROM TA-55 NEUTRALIZED AND CONCENTRATED AS A PRECIPITATE, USING CALCIUM HYDROXIDE, SOLIDIFIED WITH PORTLAND CEMENT

Waste Description *(Check only one box in each column.)*

Form	Ignitability (F)	Corrosivity (pH)	Reactivity	PCBs
[x] Solid	[ ] < 100°	[ ] ≤ 2.0	[ ] Unstable	[ ] < 50 ppm
[ ] Semisolid/sludge	[ ] 100° to 139°	[ ] 2.1 to 12.4	[ ] Water reactive	[ ] 50 to 500 ppm
[ ] Absorbed liquid	[ ] 140° to 200°	[ ] ≥ 12.5	[ ] Cyanides	[ ] > 500 ppm
[ ] Liquid	[ ] > 200°	[x] Not aqueous	[ ] Sulfides	[x] None
[ ] Gas cylinder or vessel	[x] Not ignitable		[ ] Shock sensitive	
[ ] Multilayered			[ ] Class A or B explosive	
[ ] Suspended solids			[x] Nonreactive	
[ ] Powder or ash				

Waste Origination

A. Is this waste generated in a radiation controlled area? [x] Yes [ ] No

B. If yes, is the waste generated or accumulated in a properly defined, registered radioactive materials management area (RMMA)? (RMMA # _____) [ ] Yes [x] No

C. If the answer to question A is yes and you have determined that your waste is nonradioactive, provide justification in the additional comments section on the reverse side of this form.

Radioactivity [ ] Nonradioactive

[ ] Suspect [x] Radioactive

Activity Measure	Radiation Type	
[ ] ≤2.0 nCi/g	[x] alpha	[x] gamma
[ ] >2.0 nCi/g	[ ] $t^{1/2}$ < 20 yr	[ ] tritium
[ ] >10.0 nCi/g	[x] $t^{1/2}$ ≥ 20 yr	
[x] >100.0 nCi/g	[x] beta	

WASTE GENERATOR CERTIFICATION: *Based on my knowledge of the waste and/or chemical/physical analysis, I certify that the information on this form is correct. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.*

Waste Generator's Name (last, first, middle)	Z Number	Signature	Date
MOSS, WILLIAM DAVID	091973	William David Moss	6-17-93

If your waste management coordinator is the custodian of your waste management documentation, provide the name and mail stop of this person (optional). —>	Name (last, first, middle)	Mail Stop
	MOSS, WM. DAVID	E-518

5 43 20

Toxic Metals *(Indicate if any of the following toxic metals are present in your waste at the posted concentrations.)*

arsenic	☐ None	☑ <5.0 ppm	☐ ≥5.0 ppm	☐ TCLP	☐ Other
barium	☐ None	☑ <100.0 ppm	☐ ≥100.0 ppm	☐ TCLP	☐ Other
cadmium	☐ None	☑ <1.0 ppm	☑ ≥1.0 ppm	☐ TCLP	☐ Other
chromium	☐ None	☐ <5.0 ppm	☑ ≥5.0 ppm	☐ TCLP	☐ Other
lead	☐ None	☐ <5.0 ppm	☑ ≥5.0 ppm	☐ TCLP	☐ Other
mercury	☐ None	☐ <0.2 ppm	☑ ≥0.2 ppm	☐ TCLP	☐ Other
nickel	☐ None	☑ <134.0 ppm	☐ ≥134.0 ppm	☐ TCLP	☐ Other
selenium	☐ None	☑ <1.0 ppm	☐ ≥1.0 ppm	☐ TCLP	☐ Other
silver	☐ None	☑ <5.0 ppm	☐ ≥5.0 ppm	☐ TCLP	☐ Other
thallium	☑ None	☐ <130.0 ppm	☐ ≥130.0 ppm	☐ TCLP	☐ Other

Organic Compounds *(Indicate if any of the following organic compounds are present in your waste at the posted concentrations.)*

benzene	☑ None	☐ <0.5 ppm	☐ ≥0.5 ppm	☐ TCLP	☑ Other unknown
carbon tetrachloride	☑ None	☐ <0.5 ppm	☐ ≥0.5 ppm	☐ TCLP	☐ Other
chlorobenzene	☑ None	☐ <100.0 ppm	☐ ≥100.0 ppm	☐ TCLP	☐ Other
chloroform	☐ None	☑ <6.0 ppm	☐ ≥6.0 ppm	☐ TCLP	☐ Other
cresol	☑ None	☐ <200.0 ppm	☐ ≥200.0 ppm	☐ TCLP	☐ Other
1,4-dichlorobenzene	☑ None	☐ <7.5 ppm	☐ ≥7.5 ppm	☐ TCLP	☐ Other
1,2-dichloroethane	☑ None	☐ <0.5 ppm	☐ ≥0.5 ppm	☐ TCLP	☐ Other
1,1-dichloroethylene	☑ None	☐ <0.7 ppm	☐ ≥0.7 ppm	☐ TCLP	☐ Other
2,4-dinitrotoluene	☑ None	☐ <0.13 ppm	☐ ≥0.13 ppm	☐ TCLP	☐ Other
hexachlorobenzene	☑ None	☐ <0.13 ppm	☐ ≥0.13 ppm	☐ TCLP	☐ Other
hexachlorobutadiene	☑ None	☐ <0.5 ppm	☐ ≥0.5 ppm	☐ TCLP	☐ Other
hexachloroethane	☑ None	☐ <3.0 ppm	☑ ≥3.0 ppm	☐ TCLP	☐ Other
methyl ethyl ketone	☑ None	☑ <200.0 ppm	☐ ≥200.0 ppm	☐ TCLP	☐ Other
nitrobenzene	☑ None	☐ <2.0 ppm	☐ ≥2.0 ppm	☐ TCLP	☐ Other
pentachlorophenol	☑ None	☐ <100.0 ppm	☐ ≥100.0 ppm	☐ TCLP	☐ Other
pyridine	☑ None	☐ <5.0 ppm	☐ ≥5.0 ppm	☐ TCLP	☐ Other
tetrachloroethylene/perchloroethylene	☑ None	☐ <0.7 ppm	☑ ≥0.7 ppm	☐ TCLP	☐ Other
trichloroethylene	☑ None	☐ <0.5 ppm	☐ ≥0.5 ppm	☐ TCLP	☐ Other
2,4,5-trichlorophenol	☑ None	☐ <400.0 ppm	☐ ≥400.0 ppm	☐ TCLP	☐ Other
2,4,6-trichlorophenol	☑ None	☐ <2.0 ppm	☐ ≥2.0 ppm	☐ TCLP	☐ Other
vinyl chloride	☐ None	☑ <0.2 ppm	☐ ≥0.2 ppm	☐ TCLP	☐ Other

KC 6/17/93

Hazardous Constituents *(Identify hazardous constituents for F- and K-listed wastes and substances causing waste to exhibit a characteristic.)*

Additional Comments *(Provide comments regarding the chemical or radiological nature of the waste.)*

RADIOACTIVITY Alpha may be as high as 200 uci/gram
U 235, pu 238, pu 239, Am 241

Do not write in this box - EM-8 use only

Waste Classification

☐ Non-RCRA waste	☐ RCRA-regulated solid waste	☑ RCRA-regulated hazardous waste	☐ Radioactive waste
☐ PCB ☐ non-PCB TSCA waste ☐ asbestos	☐ municipal refuse ☐ nonhazardous chemical waste ☐ administratively controlled waste ☐ sanitary/industrial sludges	☐ hazardous waste ☐ mixed low-level waste ☑ mixed transuranic waste	☐ low-level waste ☐ transuranic waste

RCRA Code 1	RCRA Code 2	RCRA Code 3	RCRA Code 4	RCRA Code 5	RCRA Code 6	RCRA Code 7	RCRA Code 8
F001	F002	F005	D007	D008	D009		

EM-8 Reviewer's Signature	Date	Cost Center/Program Code for Analysis	Reference Number
J Claypoon	6/17/95		

CHRONOLOGICAL ORIGIN AND IMPLEMENTATION OF THE ACTINIDE SOURCE-TERM WASTE TEST PROGRAM (STTP); BACKGROUND OF THE TESTS

Prepared for DOE-Carlsbad Area Office

July 24, 1998

Prepared by: Bob Villarreal
Los Alamos National Laboratory

CHRONOLOGICAL ORIGIN AND IMPLEMENTATION OF THE ACTINIDE SOURCE-TERM WASTE TEST PROGRAM (STTP); BACKGROUND OF TESTS

DOE submitted a No-migration Variance Petition to the EPA under 40 CFR 268.6 to place a limited amount of untreated hazardous waste subject to the RCRA land disposal restrictions in the WIPP for purposes of testing and experimentation for five years.

March 1989

↓

The EPA grants DOE a Conditional No-migration Determination to allow DOE to place waste in the WIPP for the purpose of conducting tests or experiments to demonstrate the long-term acceptability of the facility.

Conditions:

- **All wastes tested must be retrievable**
- **Flammable mixtures of gases in headspace of test containers is prohibited**
- **Bin experiments must have carbon filters**
- **Others**

November 14, 1990

↓

WIPP Performance Demonstrations

Experimental Needs

- Amount of Gas Generated in Waste by:
  - Corrosion
  - Microbial Decomposition
  - Radiolysis
- Effect of Brine on:
  - Gas Generation
  - Solubility of Actinides
- Effect of Influencing Variables on:
  - Gas Generation
  - Solubility of Actinides

↓

Proposed Demonstrations and Tests

- Bin Scale Tests
  - Dry
  - Wet (Brine)
- Alcove Tests
- Laboratory Tests with Simulated Wastes
- Laboratory Tests with Actual Wastes
  - Liter-Scale Tests with Brine
  - Drum-Scale Tests with Brine

↓

National Academy of Sciences Supports Laboratory Tests with Actual Wastes
1989-1990

↓

Technical Requirements for the CH-TRU Waste Solubility/Leaching Program
Issued by Sandia National Laboratories

75 Liter-Scale Test Containers
99 Drum-Scale Test Containers

SAND91-2111
Mark Phillips and Martin Molecke
1991

↓

Technical Requirements for the Contact-Handled Transuranic Waste Source-Term Test Program
Issued by Sandia National Laboratories

75 Liter-Scale Test Containers
117 Drum-Scale Test Containers

SAND91-2111
Mark Phillips and Martin Molecke
November 1991

↓

Bid Estimates too High
Technical Requirements Modified by Sandia National Laboratories
January 1992

↓

Technical Requirements for the Contact-Handled Transuranic Waste Source-Term Test Program
Issued by Sandia National Laboratories
39 Liter-Scale Test Containers
24 Drum-Scale Test Containers
SAND91-2111
Mark Phillips and Martin Molecke
March 1992

↓

Relationship of STTP and WIPP Bin Scale Tests
STTP to be conducted in parallel with bin-scale tests and the Laboratory test programs
SAND91-2111
March 1992

↓

Final Proposals for Contact-Handled Transuranic Waste Source-Term Program Due to WPSO and WPIO (Joe Lippis and Arlen Hunt)

May 15, 1992

↓

Site selection process completed by WIPP Project Integration (WPIO) and Project Site Office (WPSO)
LANL selected to conduct STTP
Work to commence 10-1-92
Public Announcement by John Arthur, III

August 18, 1992

↓

DOE/WPIO appoints STTP representative, Robert Houck
SNL appoints technical representative, Mark Phillips
LANL appoints STTP Project Leader, Bob Villarreal

October 1992

↓

U.S. Congress passes WIPP Land Withdrawal Act
LWA reaffirms EPA's role as regulator
DOE is to submit CCA to EPA
Removes requirement for No-migration Determination
Provides Secretary with flexibility to determine the need for engineered and natural barriers

October 8, 1992

↓

Approval and review chain for STTP documents established by WPIO

- U.S. DOE WPIO Project Director, John Arthur, III
- LANL Program Director, James Shipley
- LANL Program Manager, Bruce Erdal
- SNL/NM Manager, Wendell Weart
- DOE/WPIO Chief, Patrick Higgins
- SNL/NM Manager, Richard Lincoln
- SNL/NM Manager, James Nowak
- SNL/NM Representative, Mark Phillips
- LANL Group Leader, John Phillips
- DOE/WPIO Representative, Robert Houck
- LANL Project Leader, Robert Villarreal

November 1992

↓

LANL Funded to Conduct STTP

December 1992

↓

Revised Technical Requirements Document
Issued by Sandia National Laboratory

39 Liter-Scale Tests
15 Drum-Scale Tests

Mark Phillips and Martin Molecke
December-January 1993

↓

Coordination of responsibility established between SNL and LANL for preparation of STTP plan

December 13, 1992

↓

LANL Establishes STTP Work Breakdown Structure
15 Major Elements

October 1992 – January 1993

↓

LANL Commences Preparation of Regulatory Documentation

- ES&H Questionnaire
- NEPA Determination
- Environmental Assessment
- SAR Review
  - CMR
  - Size Reduction Facility
- NESHAPS FFCA
- RCRA FFCA
- USQ
- STTP Management Plan
- STTP Test Plan
- STTP QA Project Plan

October, 1992 – February 1993

↓

FY '92 STTP Preparatory Activities
(Calendar Year 1993)

- Initiate 15 WBS Elements
- Completed STTP Test Plan 7-27-93
- Completed STTP Management Plan 7-28-93
- EA Submitted (Seven times to Headquarters)
- Design of Experiments Finalized

October 1992 through October 1993

↓

DOE announces that radioactive waste testing with actual wastes will be conducted at Los Alamos National Laboratory and other sites rather than the WIPP site

October 21, 1993

↓

NAS Panel recommends design of STTP experiment and test containers should be for 10-12 years

October 1993

↓

Technical Requirements for the Actinide Source-Term Waste Test Program (Final)
Issued by Sandia National Laboratory

39 Liter-Scale Tests
15 Drum-Scale Tests

SAND91-2111
Mark Phillips and Martin Molecke
October 1993

↓

DOE Appoints George Dials, Manager of Carlsbad Area Office
December 9, 1993

↓

- Transfer of Management of STTP from DOE WPIO - WPSO to DOE-CAO
- Technical Lead – SNL
- Management Chain to Experimental Programs Manager – CAO
- Implementation of STTP – LANL
- SNL Representative – Chris Craft
- CAO Manager – Richard Lark

January – October 1994

↓

- Selection of Waste Drums from LANL Inventory Completed (SNL approval)
- Preparation of Size Reduction Facility for Characterization and Loading of Waste Complete
- Design and Fabrication of Environmental Enclosures Complete
- Design and Fabrication of Liter-Scale and Drum-Scale Tests Complete
- Design and Procurement of Analytical Equipment with Gloveboxes Complete

↓

- Development of Analytical Methodologies On-Going
- Readiness Review of Size Reduction Facility Initiated (SNL Oversight)
- Readiness Review of Test Containers Initiated (SNL Oversight)
- Readiness Review of Pressurized Test Containers Initiated (SNL Oversight)
- Readiness Review of CMR Enclosures Initiated (SNL Oversight)
- Readiness Review of Analytical Installations and Methods Initiated (SNL Oversight)
- All Documentation Completed "Except EA"

January – October 1994

↓

STTP Goals, Objectives, Activities, and Status Presented to Full Panel of National Academy of Sciences, New Mexico EEG, New Mexico Environmental Department, State of New Mexico, and DOE Headquarters

LANL – SNL Presentation

April 6, 1994

↓

All Elements of STTP WBS Completed
December 1994

↓

STTP Environmental Assessment Approved; Finding of No Significant Impact Documented
January 23, 1995

↓

LANL Receives Authorization to Initiate STTP from CAO – Dick Lark
January 20, 1995

↓

Shipment of Waste to Waste Characterization, Reduction, and Repackaging Facility

TA-54 Inventory	2-1-95
CMR Building	2-3-95
TA-55 Inventory	2-15-95

↓

Commenced Core Drilling
Completed Loading of Liter-Scale Test Containers
Added Brine to Liter-Scale Test Containers
Transported LS Test Containers to CMR
Added Inoculum to Liter-Scale Test Containers

March 23, 1995

↓

Commenced Liter-Scale Tests

March 29, 1995

↓

- Commenced Characterization of Heterogeneous Waste for Drum-Scale Tests
- Completed Loading of Drum-Scale Tests
- Transferred Drum-Scale Tests to CMR
- Added Inoculum to Drum-Scale Tests

May 9, 1995

↓

Commenced Drum-Scale Tests
May 10, 1995

↓

Completed First Data Package of Liter-Scale Tests
May 26, 1995

↓

Completed First Data Package of Drum-Scale Tests
June 19, 1995

↓

Conducted Sampling and Analysis of Brine and Headspace Gas for All Test Containers
Remainder of 1995

↓

Plan for the Utilization and Interpretation of Actinide Source-Term Waste Test Program Data
Issued by SNL
November 2, 1995

↓

- Completed First Year of STTP Sampling and Analysis Activities
- Received Revised Technical Requirements Document from SNL
- Continued Sampling and Analysis

April 1996

↓

- Prepared New Test Plan for the STTP
- Presented Results of First Year of STTP Tests to CAO-Manager
- CAO Experimental Programs and STTP Assigned to Butch Stroud
- Continued to Conduct Sampling and Analysis

June, July, August 1996

↓

Sandia National Laboratory Submits "Report on Comparison of TRU Waste Tests from the STTP with the SNL WIPP Actinide Solubility Submodel"

December 1996

↓

- LANL Adds MgO to Pressurized Liter-Scale Test Container No. 28
- Conducts Analyses of Pretest Conditions and Post Test Results

February, March 1997

↓

- Test Results and Status of STTP Presented to CAO-Manager
- Second Year of Sampling and Analysis Completed
- Data Trends of STTP Results Compiled and Presented to CAO and SNL

April 1997

↓

- Data and Results from STTP Sampling and Analysis Presented to National Academy of Sciences Panel in Washington D.C.
- Included New Mexico EEG
- Included Results of MgO Addition to STTP Pressurized Test Container No. 28
- NAS Requested Special Session for STTP Experiments and Results
- SNL Presented Comparison of STTP Data with Latest Actinide Solubility Submodel

May 15-16, 1997

↓

The Actinide Source-Term Waste Test Program (STTP)

The STTP is an extensive and dynamically designed test to:

- **Provide time-sequential quantitative measurements of mobile actinide (TH, U, Np, Pu, Am) concentrations in WIPP brines that have been in continual contact with actual CH-TRU wastes;**
- **Determine the influence of additive chemical variables on the concentration of mobile actinides in STTP test containers, including influences of gas generation, speciation, and microbial activity;**
- **Determine relative gas accumulation concentrations in headspace of test containers as a result of corrosion, microbial activity, and radiolytic degradation of waste and brine; and**
- **Allow comparison with the hypotheses of the Actinide Solubility and Colloid Characterization models developed from controlled laboratory tests.**

The Actinide Source-Term Waste Test Program (STTP)

The STTP consists of:

15 Drum-scale tests with heterogeneous wastes (combustibles, lab wastes, metal, etc.)

33 Liter-scale tests with homogeneous wastes (sludges, cemented or solidified wastes, pyrochemical salts, etc.)

6 pressurized Liter-scale tests are 60 bar with homogeneous wastes

Drum-scale tests:

- 65 gallon all titanium vessels
- Double O-ring purgeable lid

Liter-scale tests:

- 3-liter all titanium vessels
- Double O-ring purgeable lid

Pressurized Liter-scale tests:

- 2-liter all titanium vessels
- 60-bar tests (870 psig) with CO_2
- Sampling pressure @ 60 bar

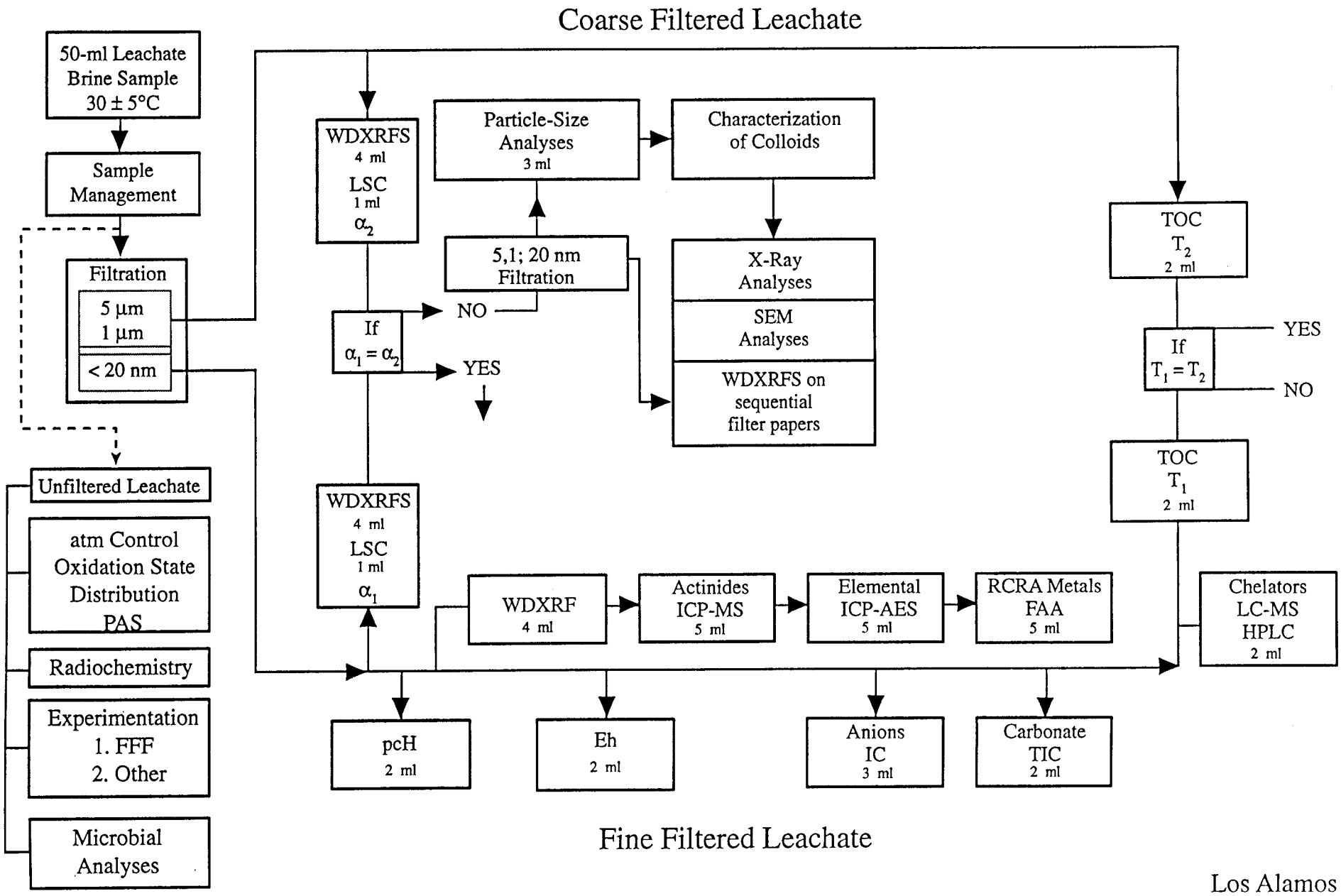
STTP liter-scale test matrix

	L-1	L-2	L-3		
TRUCON	111/211	111/211	111/211	Solidified aqueous inorganic process sludge	
Brine	A	A	CASTILE	Portland cement	10:1 / 2:1 / 2:1
	L-4	L-5	L-6		
TRUCON	111/211	111/211	111/211	Solidified aqueous inorganic sludge with CO_2	
Brine	A	A	CASTILE	Portland cement	10:1 / 3:1 / 2:1
	L-7	L-8	L-9		
TRUCON	111/211	111/211	111/211	Solidified aqueous inorganic sludge w/o Fe	
Brine	A	A	CASTILE	Portland cement	10:1 / 2:1 / 2:1
	L-10	L-11	L-12		
TRUCON	111/211	111/211	111/211	Solidified aqueous inorganic sludge w/o Fe;	
Brine	A	A	CASTILE	Am-241 added -- Portland cement	10:1 / 2:1 / 2:1
	L-13	L-14	L-15		
TRUCON	112/212	112/212	112/212	Absorbed organic liquids	
Brine	A	A	CASTILE	Envirostone	2:1 / 2:1 / 2:1
	L-16	L-17	L-18		
TRUCON	113/213	113/213	113/213	Absorbed aqueous laboratory waste	
Brine	A	A	CASTILE	Envirostone	2:1 / 2:1 / 2:1
	L-19	L-20	L-21		
TRUCON	114/214	114/214	114/214	Cemented inorganic particulates	
Brine	A	A	CASTILE	Envirostone	2:1 / 2:1 / 2:1
	L-22	L-23	L-24		
TRUCON	126/226	126/226	126/226	Cemented organic sludge	
Brine	A	A	CASTILE	Envirostone	2:1 / 2:1 / 2:1
	L-25	L-26	L-27		
TRUCON	124/224	124/224	124/224	Pyrochemical salts	2:1 / 2:1 / 2:1
Brine	A	A	CASTILE		
	L-28	L-29	L-30		
TRUCON	124/224	124/224	124/224	Pyrochemical salts with CO_2	2:1 / 2:1 / 2:1
Brine	A	A	CASTILE		
	L-31	L-32	L-33		
TRUCON	124/224	124/224	124/224	Pyrochemical salts with brine - equilibrated	
Brine	A	A	CASTILE	bentonite	2:1 / 2:1 / 2:1
	L-34	L-35	L-36		
TRUCON	124/224	124/224	124/224	Pyrochemical salts with $Ca(OH)_2$ and	
Brine	A	A	CASTILE	chelators	3:1 / 3:1 / 3:1
	L-37	L-38	L-39		
TRUCON	124/224	124/224	124/224	Pyrochemical salts w/o Fe; Am-241 added	
Brine	A	A	CASTILE		2:1 / 2:1 / 2:1

STTP drum-scale test matrix

	D-1	D-2	D-3	
TRUCON	116/216	116/216	116/216	Combustibles
Brine	A	A	CASTILE	
Waste (lbs)	43	59.1	47.2	
Total (lbs)	740.2	728.4	720	
	D-4	D-5	D-6	
TRUCON	116/216	116/216	116/216	Combustibles and
Brine	A	A	CASTILE	brine - equilibrated bentonite
Waste (lbs)	72.6	85.5	76.6	
Total (lbs)	765	723	746	
	D-7	D-8	D-9	
TRUCON	116/216	116/216	116/216	Combustibles
Brine	A	A	CASTILE	with chelators
Waste (lbs)	122.6	51.55	56.65	
Total (lbs)	783.4	726	720.6	
	D-10	D-11	D-12	
TRUCON	116/216	116/216	116/216	Combustibles and
Brine	A	A	CASTILE	sodium nitrate/ phosphates
Waste (lbs)	66.4	48.6	66.4	
Total (lbs)	728	754.6	717	
	D-13	D-14	D-15	
TRUCON	117/217	117/217	117/217	Metals
Brine	A	A	CASTILE	
Waste (lbs)	171.4	136.8	162.2	
Total (lbs)	867.4	846.2	860	

Sampling and Analyses Sequential Flowsheet



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