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Attachment B

**Closure Certification Report for the TA-54, Area L Hazardous
Waste Treatment/Storage Tanks, Revision 0.0
LA-UR-06-6756**

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Closure Certification Report for the TA-54, Area L Hazardous Waste Treatment/Storage Tanks

Revision 0.0

**Los Alamos National Laboratory
Los Alamos, New Mexico 87545**

June 2003

**CLOSURE CERTIFICATION REPORT FOR THE
TA-54, AREA L HAZARDOUS WASTE
TREATMENT/STORAGE TANKS**

Revision 0.0

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Executive Summary

This Closure Certification Report describes the actions performed to meet closure requirements for the two hazardous waste treatment/storage tanks at Los Alamos National Laboratory (LANL) Technical Area (TA) 54, Area L. The *TA-54, Area L Closure Plan for Hazardous Waste Treatment/Storage Tanks* (LANL 2002) (hereafter referred to as Closure Plan) addresses closure of the two tanks and decontamination of the concrete pad (Pad TA-54-35) on which they were located.

The Closure Plan calls for managing the two tanks based on the results of waste characterization sampling and analysis and confirmation of acceptable knowledge pertaining to the tanks. Because the tank liners were folded in the bottom of the tanks and were documented as never having been used in the treatment or storage of waste, they were not included in the closure activities. Although continuing as a permitted container storage unit, the concrete pad (Pad TA-54-35) was decontaminated during closure of the tanks. The decontamination wash water was managed according to the sampling and analysis performed.

Closure of the two tanks began on July 30, 2002, when the tank covers and the tank liners were removed from the tanks. On August 8, 2002, the two tanks were cut in half and representative samples were taken from the tank debris resulting from the cutting activities. Pad TA-54-35 was decontaminated by sweeping and washing with an Alconox[®] and water solution on August 8, 2002, and September 5, 2002. Wastes associated with the closure activities included the tanks, tank covers, pad decontamination sweepings, equipment, decontamination wash water, saw blades, personal protective equipment, sampling equipment and supplies, and a plastic sheet used for collecting the tank debris and staging the potentially contaminated materials. Analytical results for the tank debris and decontamination wash water indicated that the tanks and wash water were not Resource Conservation and Recovery Act (RCRA)-regulated hazardous waste, and the pad had been successfully decontaminated.

The tanks, decontamination wash water, and waste generated by closure activities were not RCRA-regulated hazardous waste. The tanks were removed from TA-54, Area L on September 7, 2002, and were recycled through LANL's scrap metal recycling program. The decontamination wash water and the waste generated by closure activities were shipped to an offsite disposal facility as nonhazardous waste.

The documents and records cited in this report can be obtained from the LANL Risk Reduction and Environmental Stewardship Division, Solid Waste Regulatory Compliance Group, or Facility and Waste Operations Division, Solid Waste Operations Group.

CLOSURE CERTIFICATION REPORT FOR THE TA-54, AREA L HAZARDOUS WASTE TREATMENT/STORAGE TANKS

1.0 Introduction

1.1 Background

This Closure Certification Report describes the activities performed to meet closure requirements for the two hazardous waste treatment/storage tanks located at Los Alamos National Laboratory (LANL) Technical Area (TA)-54, Area L (see Figures 1 and 2). The tanks were permitted for hazardous waste treatment and storage under the LANL *Hazardous Waste Facility Permit* (HWFP) (NMED 1989). Two of the original four tanks were decommissioned and closed in 1994. This Closure Certification Report addresses the closure of the remaining two tanks.

The New Mexico Environment Department (NMED) originally approved the closure plan for these tanks in 1989 as part of the original LANL HWFP (NMED 1989). NMED approved a revised closure plan in 1995. The revised closure plan addressed closure of two of the four treatment/storage tanks and is part of LANL's current HWFP (NMED 1989). On August 19, 2002, DOE submitted to the NMED the revised *TA-54, Area L Closure Plan for Hazardous Waste Treatment/Storage Tanks* (LANL 2002) (hereafter referred to as Closure Plan) that addressed closure requirements of the remaining two treatment/storage tanks based on current knowledge. Closure activities began on July 30, 2002, with the removal of the tank covers and the liners (which were never used and were folded in the bottom of the tanks). Tank sampling, initial decontamination of Pad TA-54-35, containerization of generated waste, and sampling of the decontamination wash water were performed on August 8, 2002. A second decontamination of Pad TA-54-35 and verification sampling of the decontamination wash water were performed on September 5, 2002.

1.2 Purpose

The purpose of this Closure Certification Report is to demonstrate that closure of the two tanks at TA-54, Area L was achieved substantially in accordance with the Closure Plan submitted to the NMED (LANL 2002). Section 2.7 of this Closure Certification Report describes any variances from that Closure Plan. This Closure Certification Report also presents the analytical data generated to ensure proper waste characterization, shipping, and disposal, and contains the independent professional engineering closure certification, as required by the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC), Subpart V, 264.115.

1.3 Report Organization

Section 1.0 presents the purpose of this Closure Certification Report and provides a description of the unit being closed. Section 2.0 includes a discussion of the closure activities, results of the sampling and analysis, details regarding disposal of the wastes, and variances from the Closure Plan. Section 3.0 documents the quality assurance (QA) of the closure activities. Section 4.0 provides the certification of the accuracy of this report, the independent professional engineer certification, and the QA reviewer certification. Section 5.0 lists the references and documentation cited in this Closure Certification Report. The references cited are available through the LANL Risk Reduction and Environmental Stewardship Division, Solid Waste Regulatory Compliance Group or Facility and Waste Operations Division, Solid Waste Operations Group.

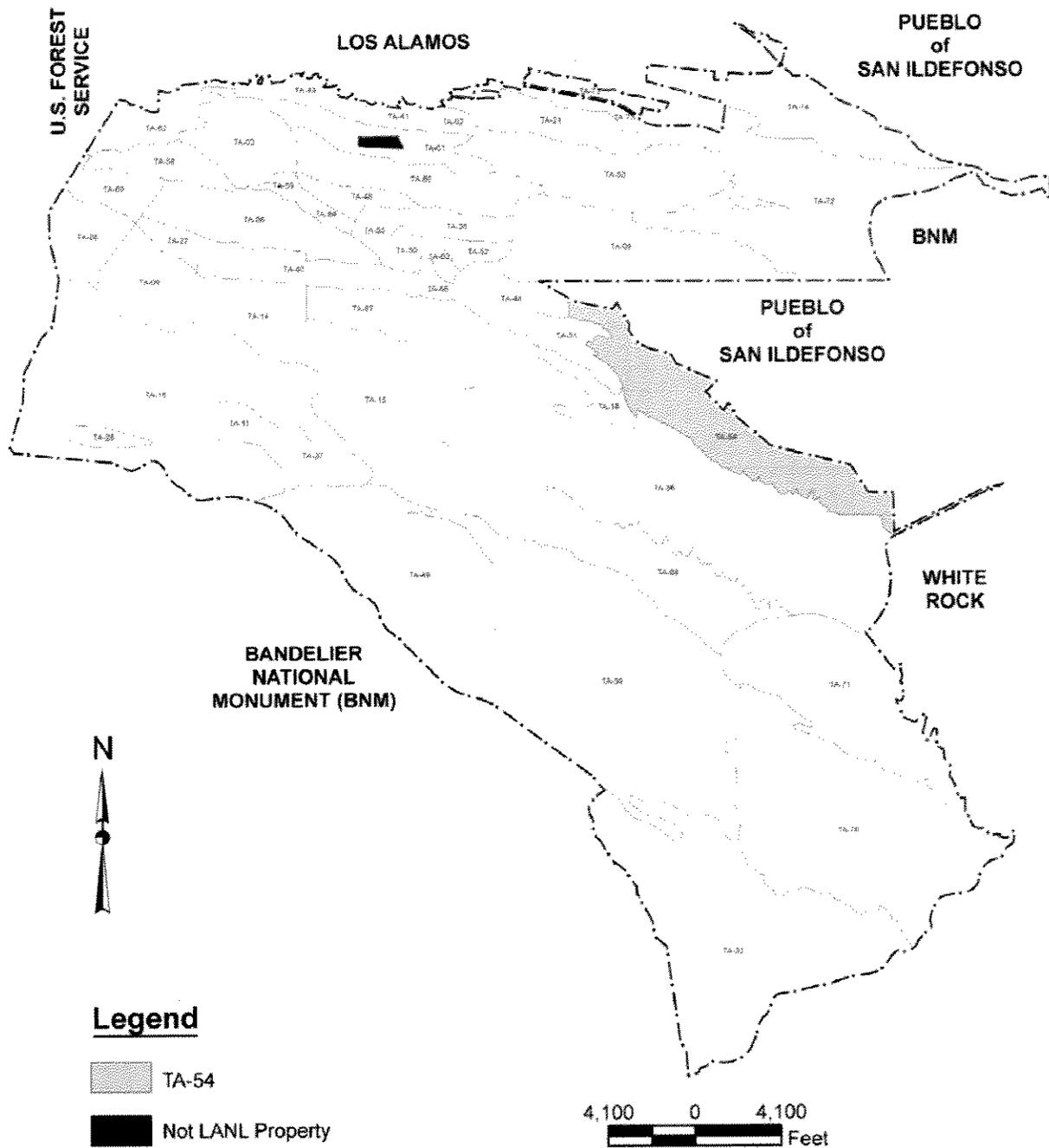


Figure 1. Location Map of Technical Area TA-54 at Los Alamos National Laboratory

1.4 Description of Tanks

Each tank measured 4 feet tall by 9 feet in diameter and had an open top. The tanks, constructed of 10-gauge steel, had an approximate capacity of 1,660 gallons each. At the time of closure, the two tanks were situated on a bermed concrete pad (TA-54-35), which is part of a permitted container storage unit (CSU) that will remain in service (see Figure 2). Each tank was covered with a fabric cover and contained a liner folded on the bottom.

1.5 Description of Wastes Processed

The two tanks were used to treat ammonium bifluoride rinse water from the time they were installed in approximately 1985 until about 1987. Although ammonium bifluoride in solution is caustic, the ammonium bifluoride rinse water treated in the tanks did not meet the Resource Conservation and Recovery Act (RCRA) definition for corrosivity and, therefore, was not regulated by RCRA as a hazardous waste. Beginning in 1987, a testing program for the treatment of barium-contaminated sand began. Full-scale treatment of the barium-contaminated sand was initiated in 1989. Knowledgeable LANL employees stated that the tanks were used only to treat ammonium bifluoride and barium-contaminated sand (IT 1996), as documented and maintained by the facility. The Waste Profile Forms (WPFs) and Chemical Waste Disposal Requests (CWDRs) completed by Weapons Prototype Group (WX-3) personnel characterizing the barium-contaminated sand and documenting the shipment of the sand to TA-54, Area L, and the WPFs and CWDRs completed by EM-7 personnel characterizing the treated barium sands sludge and documenting its shipment from TA-54, Area L to a disposal site are also maintained by the facility. This documentation provides the historical tracking of the barium-contaminated sand. Based on the first-hand knowledge of LANL employees involved in the treatment and storage of waste in these tanks and on waste characterization and disposal documentation completed for the barium-contaminated sand waste sent to TA-54, Area L, the only RCRA-regulated material treated or stored in the tanks was barium-contaminated sand.

1.6 Process Description

As described above, the only RCRA-regulated waste treated or stored in the tanks was barium-contaminated sand. The barium-contaminated sand was generated by LANL's Weapons Prototype Group through the open-pit burning of high explosive (HE)- or mock HE-contaminated waste. Sand to be treated was stored in drums at TA-54, Area L until enough was accumulated for proper and economical treatment. Typically, treatment was performed after enough barium-contaminated sand was received to fill the four treatment tanks (approximately 32 55-gallon drums). Following treatment, samples of the treated material were collected from the tanks to determine treatment effectiveness. If the sample results indicated barium concentrations of less than 100 milligrams per liter (mg/L) using the Environmental Protection Agency's (EPA's) Toxicity Characteristic Leaching Procedure (TCLP), the tank contents were drummed and solidified using gypsum cement, and taken to TA-54, Area J for disposal. If the TCLP results for barium exceeded 100 mg/L, the contents of the affected tank or tanks were retreated and resampled. Approximately ten batches of barium-contaminated sand were treated, using one or more of the four tanks, between August 1988 and August 1992. No treatment has occurred in the tanks since August 1992, although the treated waste was stored in the tanks from August 1992 through the summer of 1993.

Treatment consisted of converting soluble barium compounds into barium sulfate, an insoluble, naturally occurring mineral. As documented on the WPFs, barium is the only hazardous

constituent in the sand. Water (or the solution from a previous treatment of barium-contaminated sand), calcium sulfate, and the contaminated sand were poured into the tanks. After the contents were mixed for 30 minutes, sulfuric acid was added until the pH of the treatment solution stabilized at 4.0. The detailed operating procedure (LANL 1993) and the safe operating procedure (LANL 1994) for the treatment of barium-contaminated sand at TA-54, Area L describe in detail the process for treating the sand. The treatment "run log" for the tanks describes the barium-contaminated sand treatment activities from 1988 to 1992. This log is maintained by the facility.

The most recent treatment of barium-contaminated sand was performed in August 1992, and the treated sand was removed from the tanks in 1993 (the sand was not removed until after receipt of the analytical results) and disposed of in the manner described above.

2.0 Performance of Closure

2.1 Closure Activities

Closure activities for the remaining two treatment/storage tanks at TA-54, Area L began on July 30, 2002, with the removal of the tank covers and the tank liners (which were never used and were folded in the bottom of the tanks). Tank sampling, Pad TA-54-35 decontamination, and sampling of the decontamination wash water were initiated on August 8, 2002. A second decontamination of Pad TA-54-35 and verification sampling of the wash water were performed on September 5, 2002. Closure activities were performed substantially in accordance with the Closure Plan (LANL 2002) and the documented Hazard Analysis (JCNNM 2002a).

2.2 Tank Decommissioning

At the time of closure, the tanks were free of observable barium sand treatment residue. There was evidence of paint chipping and rust on the interior bottom surface of the tanks. Using a forklift, each tank was lifted off the existing supports (4-inch by 4-inch wood beams in lengths varying from approximately 4 feet to 10 feet). Two more wood beams were placed under each tank to provide additional support during cutting activities. Plastic sheets were placed over the supports and the surrounding area. The tanks were replaced on the plastic sheets. Each tank was cut in half using a reciprocating saw. Several new, unused 5-inch saw blades were used to cut the tanks. Because the original tank liners were disposed of during the closure of the first two of the four treatment tanks and the tank liners that were in the bottom of the tanks were not used in any waste treatment or storage (reference LANL 2003), they were disposed of as nonhazardous waste in a municipal landfill.

2.3 Sampling of Tank Debris

The sampling and analysis methodology outlined in the Closure Plan (LANL 2002) was performed for the purpose of waste characterization to determine proper management, including shipping and disposal, of the two tanks and other closure-related wastes. The sampling activities are documented in the sampling logbook maintained by the facility. Photographs documenting the tank sampling activities are provided at the end of this section.

On August 8, 2002, the tanks were sampled to determine the proper characterization and shipping classification. The tank debris generated by cutting the tanks in half was collected on a plastic sheet. Two composite samples of each tank debris were collected. The samples collected consisted of all of the debris generated. Sample collection activities were conducted in

accordance with the Closure Plan (LANL 2002), except as documented in Section 2.7 of this Closure Certification Report. Each sample collected was placed in an eight-ounce clear glass jar with a Teflon[®]-lined lid. Sample container labels with unique sample identifications and sample container (tamper-indicating) seals were properly completed and affixed to the sample containers as specified in Section 10.2 of the Closure Plan (LANL 2002). A chain of custody (COC) form was initiated for the tank debris samples. The samples were placed in an insulated cooler with cold blue ice. When sampling activities were completed for the day, the samples and COC form were transferred to and stored overnight at 4 degrees Celsius (°C) in a refrigerator in Building 54-1038. Building 54-1038 has controlled access and is located within the perimeter fence of Area L, which also has controlled access. Arrangements were made with Assaigai Analytical Laboratories, Inc. (AALI) to pick up the samples on the following day. On August 9, 2002, the sample containers were examined and tamper-indicating seals were determined to be intact. The COC form for one set of tank debris samples (one composite sample from each tank) was completed, and the samples were wrapped with cushioning material and placed in an insulated cooler containing cold blue ice. Decontamination wash water samples were also placed in the cooler (see Section 2.5). The cooler was securely closed, tamper-indicating seals were placed across the closure of the cooler, and the samples were turned over to AALI, for transport to their laboratory. The duplicate set of tank debris samples was kept in the refrigerator in Building 54-1038 to be used in case either of the samples was compromised during shipment or analysis.

Each sample was analyzed for the parameters listed in Table 1, in accordance with the procedures prescribed in *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846)* (EPA 1986). The sample management and custody protocols established in the Closure Plan (LANL 2002) were followed.

Table 1
Analytical Parameters for Samples of Tank Debris

Analyte	SW-846 Method	Preservative
Metals	6010/7000	Cool to 4°C

After sampling activities were concluded, the waste generated during tank cutting and sampling activities (personal protective equipment [PPE], saw blades, disposable scoops) was placed into a polyethylene bag and containerized in a B-25 waste box. The plastic sheets were labeled to identify under which tank they had been placed and were placed in the B-25. The tank covers were also placed in the B-25, which was labeled as "Non-RCRA Regulated Waste" based on acceptable knowledge from the closure of the initial two treatment/storage tanks. The B-25 was placed on containment Pad TA-54-58 to the west of Pad TA-54-35. The tank sections were labeled "scrap metal" and also placed on containment Pad TA-54-58. The reciprocating saw, extension cord, ladder, and face shields used during cutting activities remained on Pad TA-54-35 until analytical results from the cutting debris revealed that they were not contaminated with a hazardous waste, at which time they were placed in storage for reuse.

2.4 Pad TA-54-35 Decontamination

On August 8, 2002, Pad TA-54-35 was decontaminated as described in the Closure Plan (LANL 2002). Photographs documenting the decontamination activities are provided at the end of this section. The pad was swept and the sweepings were placed in a polyethylene bag. The brooms and shovel used to sweep and collect the sweepings remained on pad TA-54-35 pending disposition until analytical results were received. Two clean 5-gallon buckets and two clean

mops were used to perform the decontamination activities. A solution of Alconox[®] and water was prepared in the buckets. A mop was inserted into each bucket and lifted up and down to completely soak the mop and further mix the Alconox[®] solution. The mops were removed from the bucket, allowing the solution to drain back into the bucket and squeezed to remove excess solution. A sample of the clean solution was then collected as described in Section 2.5.

Pad TA-54-35 was then mopped down, including the sump at the north end of the pad. The curb was then mopped down. After the decontamination washing was completed, the mops were rung out by hand to drain any remaining liquid into the buckets.

The used decontamination wash water was poured into a 5-gallon carboy. The contents of the carboy were shaken to mix. Two samples of the used decontamination wash water were then collected as described in Section 2.5.

The analytical results for the initial decontamination wash water obtained during the August 2, 2002, decontamination activities indicated the presence of barium, chromium, and silver at or above the baseline (clean wash water prepared on that date) results, but below RCRA regulatory limits. Therefore, on September 5, 2002, a second decontamination of Pad TA-54-35 was performed. The September 5, 2002, decontamination involved three washings of Pad TA-54-35. First, the pad and sump were swept with two new brooms and a new dustpan. Sweepings were placed in a plastic bag. A solution of Alconox[®] and water was prepared in a new bucket. The berm, pad, and sump were mopped down using a new mop. The used decontamination wash water was poured, using a new funnel, into the 5-gallon carboy that was used for the August 8, 2002, decontamination activities. This was done because analytical results for the original decontamination wash water already contained in the carboy were less than RCRA regulatory limits and the results for decontamination wash water collected on September 5, 2002, were not anticipated to be above the August 8, 2002, results. The used mop and bucket were rinsed with Alconox[®] and fresh water between each of the three washings. The used decontamination wash water and equipment rinse water were placed in the same carboy until full. A second carboy was used to collect the remaining mop rinse water. The clean decontamination wash water sample was collected from the third and final wash water solution prepared on September 5, 2002. The used decontamination wash water sample for the September 5, 2002, decontamination activities was collected from the second carboy. Therefore, the sample would contain only those contaminants remaining after the third and final decontamination wash. Analytical results for the September 5, 2002, decontamination wash water were at or below the baseline results for the clean wash water.

2.5 Decontamination Wash Water Sampling

Details of the sampling activities are provided in the sampling logbook maintained by the facility. Photographs documenting the sampling activities are provided at the end of this section.

On August 8, 2002, the decontamination wash water from the decontamination of Pad TA-54-35 was sampled and analyzed for the parameters identified in Table 2 to determine the proper characterization and shipping classification. Two samples were taken of the clean Alconox[®] wash solution before use to be analyzed as baseline samples. Two samples of the decontamination wash water were collected after washing Pad TA-54-35. Sample collection activities were conducted in accordance with the Closure Plan (LANL 2002). Each sample collected was placed in a 1-liter amber glass jar with a Teflon[®]-lined lid. Sample container labels, with unique sample identifications, and sample container (tamper-indicating) seals were properly

completed and affixed to the sample containers as specified in Section 10.2 of the Closure Plan. The clean wash water sample was labeled "clean bucket" and the used decontamination wash water sample was labeled "dirty bucket." Information for the "clean bucket" sample and the "dirty bucket" sample was added to the COC form initiated for the tank cutting debris samples. The "clean bucket" and "dirty bucket" samples were placed in an insulated cooler with cold blue ice. When sampling activities were completed for the day, the samples and COC form were transferred to and stored overnight at 4°C in a refrigerator in Building 54-1038. Building 54-1038 has controlled access and is located within the perimeter fence of TA-54, Area L, which also has controlled access. Arrangements were made with AALI, to pick up the samples on the following day. On August 9, 2002, the sample containers were examined and tamper-indicating seals were determined to be intact. The COC form was completed for one "clean bucket" sample and one "dirty bucket" sample, and the samples were wrapped with cushioning material and placed in an insulated cooler containing cold blue ice and the tank cutting debris samples (see Section 2.3). The cooler was securely closed, tamper-indicating seals placed across the closure of the cooler, and the samples were turned over to AALI, for transport to their laboratory. The duplicate "clean bucket" sample and the duplicate "dirty bucket" sample were kept in the refrigerator in Building 54-1038 to be used in case either of the samples was compromised during shipment or analysis.

Table 2
Analytical Parameters for Samples of Clean and Used Decontamination Wash Water

Analyte	SW-846 Method	Preservative
Metals	6010/7000/7470/7471	Cool to 4°C

After sampling activities were completed on August 8, 2002, the used decontamination wash water containerized in the 5-gallon carboy was labeled as "Non-RCRA Regulated Waste" and placed in Building TA-54-31. The decontamination equipment (mops, buckets, PPE) and sampling PPE were placed in the polyethylene bag containing the pad sweepings and placed in a 55-gallon poly drum. The 55-gallon poly drum was placed in Building TA-54-31. The 5-gallon carboy and 55-gallon poly drum remained in Building TA-54-31 until disposition. The brooms and shovel used to sweep and collect the sweepings from Pad TA-54-35 remained on Pad TA-54-35 until analytical results were reviewed, at which time the materials were placed into storage for reuse.

On September 5, 2002, after the second decontamination of Pad TA-54-35, clean and used decontamination wash water samples and duplicates were collected substantially in the same manner as those collected on August 8, 2002. However, eight-ounce amber glass jars were used for sample collection on September 5, 2002. A new COC form was initiated for the September 5, 2002, samples. On September 9, 2002, AALI, notified LANL that the original samples submitted for the September 5, 2002, sampling event, although received, could not be located. The duplicate samples were submitted to AALI, on September 11, 2002. Each sample was analyzed for the parameters listed in Table 2, in accordance with the procedures prescribed in *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846)* (EPA 1986). The sample management and custody protocols established in the Closure Plan (LANL 2002) were followed.

After being sampled on September 5, 2002, the used decontamination wash water was placed in the same 5-gallon carboy used on August 8, 2002, until full. A second 5-gallon carboy was used for the remaining wash water and was labeled as "Non-RCRA Regulated Waste" and placed in Building TA-54-31. The decontamination equipment (brooms, dust pans, mops,

buckets) and sampling equipment (funnel) were placed into storage for reuse based on analytical results from the August 8, 2002, sampling.

2.6 Disposition of Wastes Generated

2.6.1 Recycling of Tank Halves

The tank debris samples were labeled "Tank 1" and "Tank 2." Contamination of the two tanks was evaluated based on the analysis of the samples from the tank cutting debris. This is appropriate for characterization of the tanks because any contamination associated with the tanks would also be associated with the debris generated from cutting the tanks. Tables 3a and 3b summarize the analytical results for the tank debris for total metals and TCLP metals, respectively. The analytical laboratory analyzed the samples using the methods in SW-846 listed in Tables 3a and 3b. The analytical reports are maintained by the facility.

For constituents whose concentration was above the regulatory limit based on total metals analysis, TCLP was performed. Table 3b provides the results for those constituents analyzed using TCLP.

Results of the waste characterization analytical reports indicated that the tank debris and, therefore, the tanks were not RCRA-regulated hazardous waste. The tank halves were removed from TA-54, Area L on September 9, 2002, and were recycled through LANL's scrap metal recycling program. Documentation supporting the recycling of the tank halves is maintained by the facility.

Table 3a
Summary of Tank Debris Analytical Results: Total Metals

Type of Analysis	Sample	EPA Method (SW-846)	Analyte	Result ^a (mg/kg)	Regulatory Limit (20x) ^b
Total Metals	Tank 1	3050A/6010A	Arsenic	33	100.0
		3050A/6010A	Barium	716	2000.0
		3050A/6010A	Cadmium	77.5	20.0
		3050A/6010A	Chromium	256	100.0
		3050A/6010A	Lead	ND	100.0
		3050A/6010A	Selenium	31.6	20.0
		3050A/6010A	Silver	ND	100.0
		7471 CVAA	Mercury	ND	4.0
Total Metals	Tank 2	3050A/6010A	Arsenic	26	100.0
		3050A/6010A	Barium	332	2000.0
		3050A/6010A	Cadmium	72.0	20.0
		3050A/6010A	Chromium	322	100.0
		3050A/6010A	Lead	ND	100.0
		3050A/6010A	Selenium	28.4	20.0
		3050A/6010A	Silver	ND	100.0
		7471 CVAA	Mercury	ND	4.0

^a Results are taken from the analytical reports.

^b Analytical results for total metals analysis were screened based on the "20 times rule," where the EPA's TCLP regulatory level concentration for a given constituent is multiplied by 20 and compared to the total concentration of the constituent in the sample. The "20 times rule" is based on SW-846 Method 1311, Toxicity Characteristic Leaching Procedure, which involves diluting the sample by 20 times. Therefore, if a sample is analyzed for total metals (i.e., the leaching procedure and hence dilution are not performed), the final concentration detected is likely to be 20 times higher than if the leaching procedure was performed.

Table 3b
Summary of Tank Debris Analytical Results: TCLP Metals

Type of Analysis	Sample	EPA Method (SW-846)	Analyte	Result ^a (mg/L)	Regulatory Limit
TCLP Metals	Tank 1	1311/3010A/6010A	Cadmium	0.098	1.0
		1311/3010A/6010A	Chromium	0.04	5.0
		1311/3010A/6010A	Selenium	0.06	1.0
TCLP Metals	Tank 2	1311/3010A/6010A	Cadmium	0.081	1.0
		1311/3010A/6010A	Chromium	0.04	5.0
		1311/3010A/6010A	Selenium	ND	1.0

^a Results are taken from the analytical reports.

2.6.2 Disposal of Decontamination Wash Water

Tables 4a and 4b summarize the analytical results of the clean wash water samples and the used decontamination wash water samples taken from the decontamination of permitted CSU Pad TA-54-35. Table 4a summarizes the analytical results for samples collected on August 8, 2002. Table 4b summarizes the analytical results for samples collected on September 5, 2002. The analytical results demonstrate that Pad TA-54-35 was successfully decontaminated. The analytical reports are maintained by the facility.

Table 4a
Summary of Decontamination #1 Wash Water Analytical Results

Type of Analysis	Sample	EPA Method (SW-846)	Analyte	Result ^a (mg/L)
Total Metals	Clean Bucket	3005A/6010A	Arsenic	ND
		3005A/6010A	Barium	ND
		3005A/6010A	Cadmium	ND
		3005A/6010A	Chromium	ND
		3005A/6010A	Lead	ND
		3005A/6010A	Selenium	ND
		3005A/7000	Silver	0.04
		7470	Mercury	ND
Total Metals	Dirty Bucket	3005A/6010A	Arsenic	ND
		3005A/6010A	Barium	0.32
		3005A/6010A	Cadmium	ND
		3005A/6010A	Chromium	0.12
		3005A/6010A	Lead	ND
		3005A/6010A	Selenium	ND
		3005A/7000	Silver	0.04
		7470	Mercury	ND

^a Results are taken from the analytical reports.

Table 4b
Summary of Decontamination #2 Wash Water Analytical Results

Type of Analysis	Sample	EPA Method (SW-846)	Analyte	Result ^a (mg/L)
Total Metals	Clean Wash Water - 2 DUP	3005A/6010A	Arsenic	0.09
		3005A/6010A	Barium	0.02
		3005A/6010A	Cadmium	ND
		3005A/6010A	Chromium	ND
		3005A/6010A	Lead	ND
		3005A/6010A	Selenium	ND
		3005A/7000	Silver	ND
		7470	Mercury	ND
Total Metals	Dirty Wash Water - 2 DUP	3005A/6010A	Arsenic	0.09
		3005A/6010A	Barium	0.02
		3005A/6010A	Cadmium	ND
		3005A/6010A	Chromium	ND
		3005A/6010A	Lead	ND
		3005A/6010A	Selenium	ND
		3005A/7000	Silver	ND
		7470	Mercury	ND

^a Results are taken from the analytical reports.

For the initial decontamination of Pad TA-54-35 (see Table 4a), the clean wash water sample was labeled “clean bucket,” and the used wash water sample was labeled “dirty bucket.” For the second decontamination of Pad TA-54-35 (see Table 4b), the clean wash water sample was labeled “clean wash water – 2 DUP,” and the used decontamination wash water sample was labeled “dirty wash water – 2 DUP.” Results of the waste characterization analytical reports indicated that the decontamination wash water was not a RCRA-regulated hazardous waste. However, the analytical results from the initial wash indicated the presence of barium, chromium, and silver at or above the baseline (clean bucket) results. Pad TA-54-35 was subsequently decontaminated a second time to ensure complete decontamination. Analytical results from the second decontamination indicated that the decontamination wash water contained the same metals at the same concentration as the clean wash water. These results indicate successful decontamination of Pad TA-54-35 based on the criteria identified in the Closure Plan, Section 8.0 (LANL 2002). On April 1, 2003, the decontamination wash water was shipped to an off-site disposal facility, Clean Harbors Aragonite, LLC, in Aragonite, Utah, for disposal. The shipping documentation is maintained by the facility.

2.6.3 Disposal of Tank Covers, and Equipment/Materials Generated by Tank Cutting and Sampling and Pad Decontamination and Sampling

The tank covers, PPE (Tyvek[®] coveralls, nitrile gloves), tank sampling equipment (scoops), used saw blades, and plastic sheets used to stage the tank debris for sampling were placed in a B-25 waste box, which was labeled as “Non-RCRA Regulated Waste.” The sweepings, PPE

(Tyvek® coveralls, nitrile gloves), mops, buckets, and equipment used to decontaminate Pad TA-54-35 and sample the wash water were placed in a 55-gallon poly drum, which was labeled as "Non-RCRA Regulated Waste." The tank covers and tank sampling-generated waste were characterized based on the analytical results from the tank cutting debris. The analytical data determined that the tank debris and, therefore, the tank covers and sampling-generated waste are not RCRA-regulated hazardous waste. All waste (PPE, plastic, tank covers, tank liners) generated during closure activities and characterized as non-RCRA regulated waste were later consolidated in to a single municipal waste dumpster, which was shipped to Los Alamos County Landfill on November 19, 2002. Nondisposable equipment (reciprocating saw, extension cord, ladder, face shields) was returned to storage.

2.7 Variances from Closure Plan

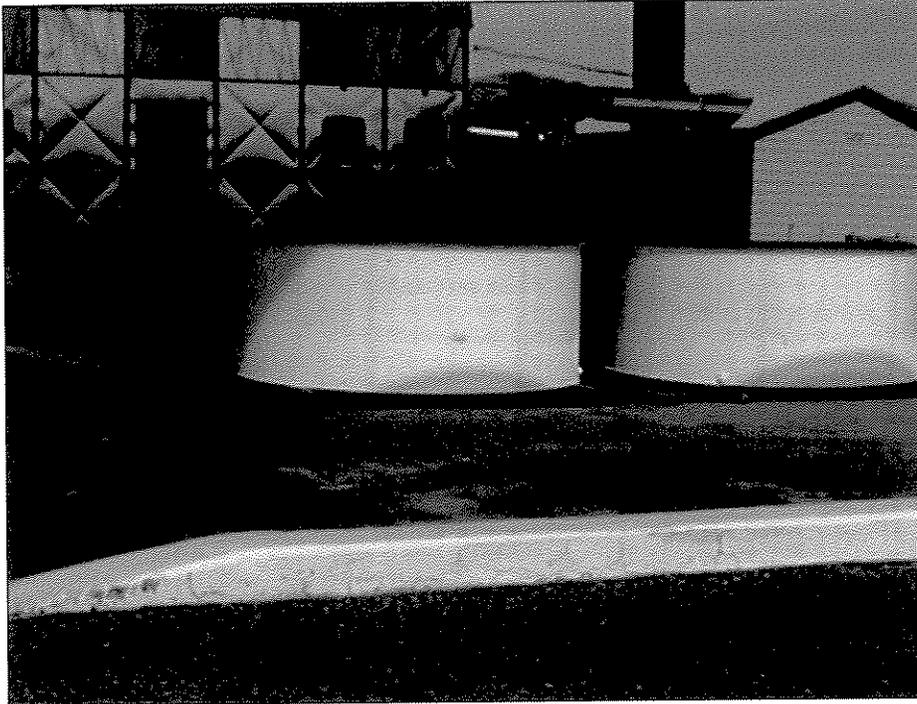
The closure of the two treatment/storage tanks at TA-54, Area L was performed substantially in accordance with the revised Closure Plan (LANL 2002), with the exception of the following variances:

- Closure Plan Section 1.3: Written notification was not provided to the NMED prior to initiating closure activities, which began on July 30, 2002. Removal of hazardous waste and decontaminating or dismantling equipment were initiated on July 30, 2002, prior to submittal of the Closure Plan to the NMED.
- Closure Plan Section 7.1: Clean wash water samples collected prior to decontamination of Pad TA-54-35 were collected by inserting a new, unused mop into a bucket containing the clean, unused Alconox® solution. The mop was lifted up and down to completely soak the mop and further mix the Alconox® solution. The mop was removed from the bucket, allowing the solution to drain back into the bucket, and squeezed to remove excess solution. A sample of the clean solution was then collected by immersing the sample container into the bucket to fill the sample container.
- Closure Plan Section 7.2: No cracks or gaps were identified on Pad TA-54-35. Therefore, no repairs were necessary prior to decontaminating the pad.
- Closure Plan Section 7.4: During decontamination of Pad TA-54-35 on August 5, 2002, the interior base surface of the pad was cleaned first, followed by the sump, and then the curb. No excess wash water was used that necessitated collection in the sump. However, the sump was washed down. The September 5, 2002, pad decontamination activities followed the sequence identified in the Closure Plan (LANL 2002).
- Closure Plan Section 10.1.1: Prior to beginning closure activities, for health and safety purposes pertaining to tank cutting activities, a field test was performed on the paint covering the interior and exterior tank surfaces. Results indicated no lead was contained in the paint (JCNNM 2002b).
- Closure Plan Section 10.1.1: Two samples of debris from each tank were taken instead of three. The third sample was originally anticipated for analyses that were later determined not to be necessary based on acceptable knowledge waste characterization documentation. Only one of the two samples collected from each tank cutting debris was submitted to the analytical laboratory for analysis. The remaining sample was maintained at Building TA-54-1038 in the event the original sample was compromised.

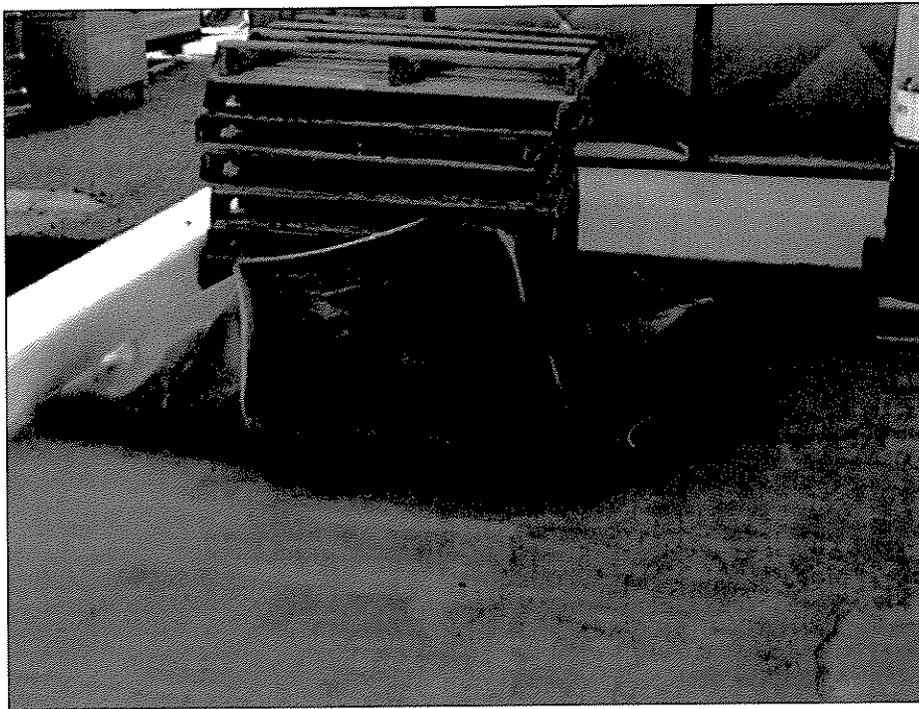
The plastic sheet was rolled toward the center of the sheet to facilitate collection of the cutting debris. Two random samples of cutting debris were collected from each tank. All of the cutting debris generated during the cutting was used to compile the samples. The sampler attempted to retrieve broken pieces of saw blade from the cutting debris; however the samples did still contain some small pieces of saw blade.

A sample analysis request sheet was not completed. The COC form provided by the analytical laboratory contained all of the pertinent information.

- Closure Plan Section 10.1.2: A composite liquid waste sampler (Coliwasa) or similar device was not used to collect the used decontamination wash water samples. No excess wash water collected in the sump. All used wash water was contained in the buckets. The sample was collected by combining the used wash water in each bucket into a 5-gallon carboy via a funnel, as necessary. The carboy was shaken to mix and a sample was poured into the sample container(s) via a funnel, as necessary.
- Closure Plan Section 10.1.3: Only a clean, unused, factory-wrapped scoop was used to collect each tank cutting debris sample. Therefore, no decontamination of tank sampling equipment was necessary.
- Closure Plan Section 10.2: As described above, no sample analysis request form was used. The COC form provided by the analytical laboratory identified the analyses to be performed on the samples.
- Closure Plan Section 10.2.2: As described above, no sample analysis request form was used. The COC form provided by the analytical laboratory identified the analyses to be performed on the samples. The analytical laboratory picked up the sample; therefore, no shipping forms were necessary.
- Closure Plan Section 10.2.2.3: As described above, no sample analysis request form was used. Field sampling information was recorded in a sample logbook.
- Closure Plan Section 10.2.3: Tank cutting debris samples were collected in four-ounce, clear glass, wide-mouth jars. Decontamination wash water samples were collected in one-liter amber glass bottles for the initial decontamination, and eight-ounce amber glass bottles for the second decontamination performed.
- Closure Plan Section 12.0: The QA reviewer took photographs of closure activities, which are provided at the end of this section with a brief statement of the activity being performed in each photo.

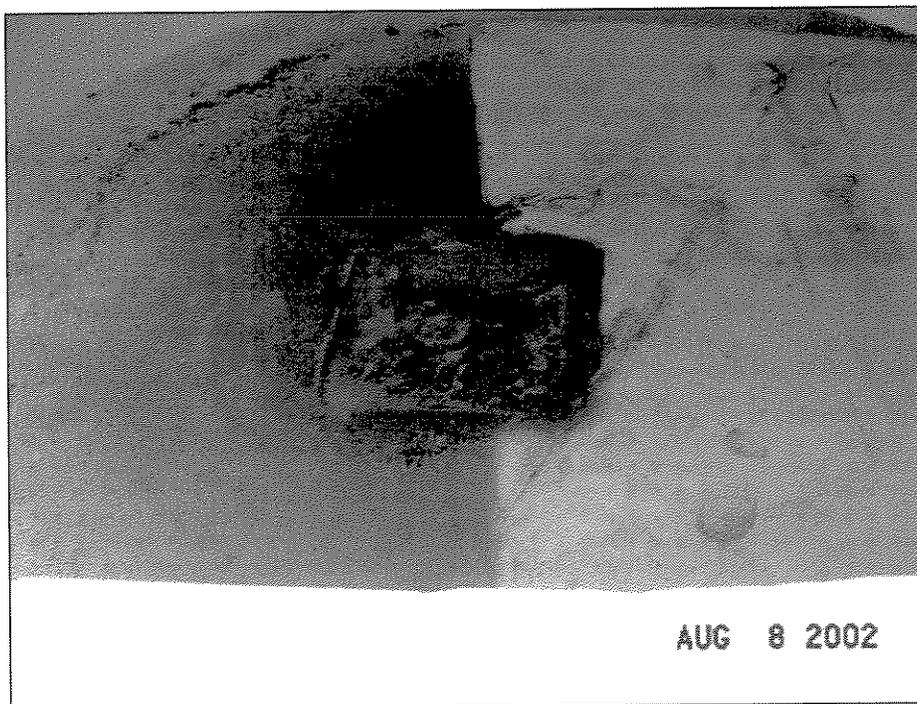


View from southeast. Entrance to pad TA-54-35 on left. Tank 1 on left. Tank 2 on right. Tanks positioned on 4-inch by 4-inch wood beams. Covers removed.



View from west. Containment pad TA-54-58 to west of pad TA-54-35. New, unused liners removed from Tank 1 and Tank 2.

Figure 3. Photographs Documenting Closure Activities

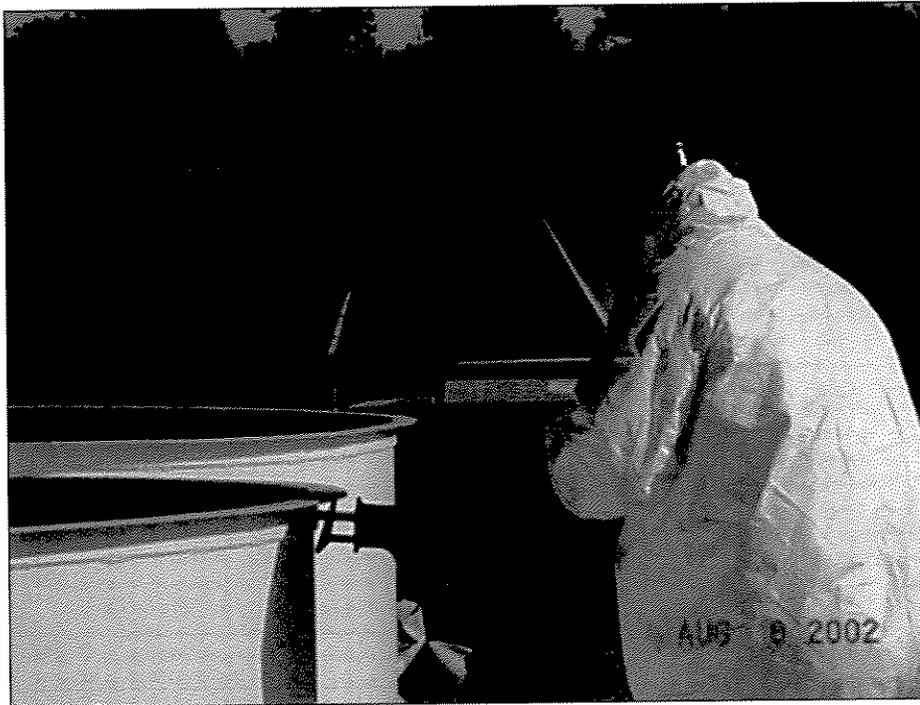


View from west. Tank 2 interior. Light area on right location of liner prior to removal.



View from southwest. Additional supports and plastic sheet in place. Repositioning Tank 1 on supports.

Figure 3. Photographs Documenting Closure Activities (Continued)

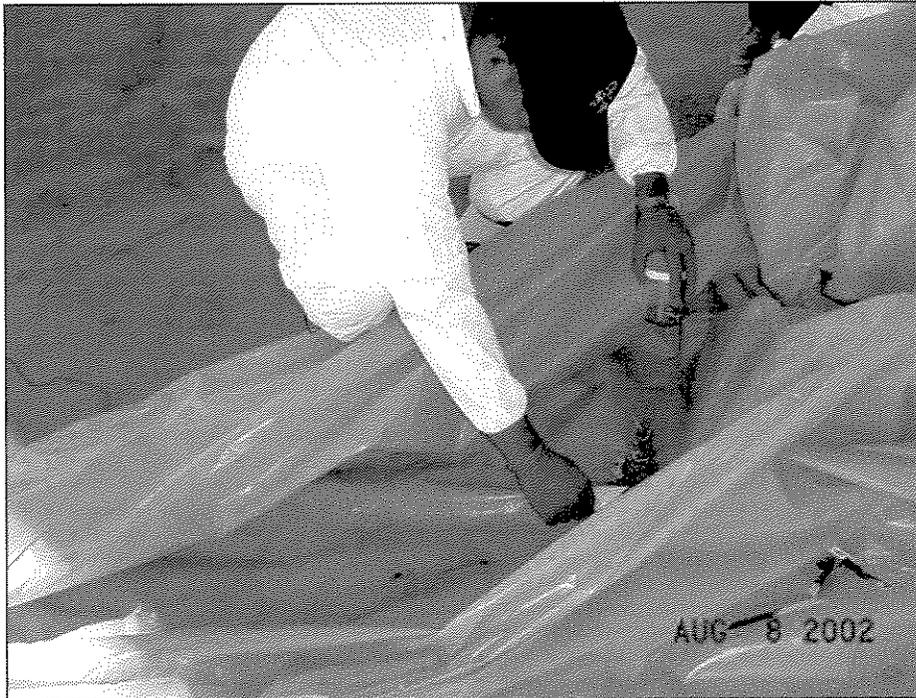


View from south. Close up of crew beginning to cut Tank 1 in half with reciprocating saw.



View from west. Tank 1 sections being removed from pad TA-54-35 with forklift.

Figure 3. Photographs Documenting Closure Activities (Continued)

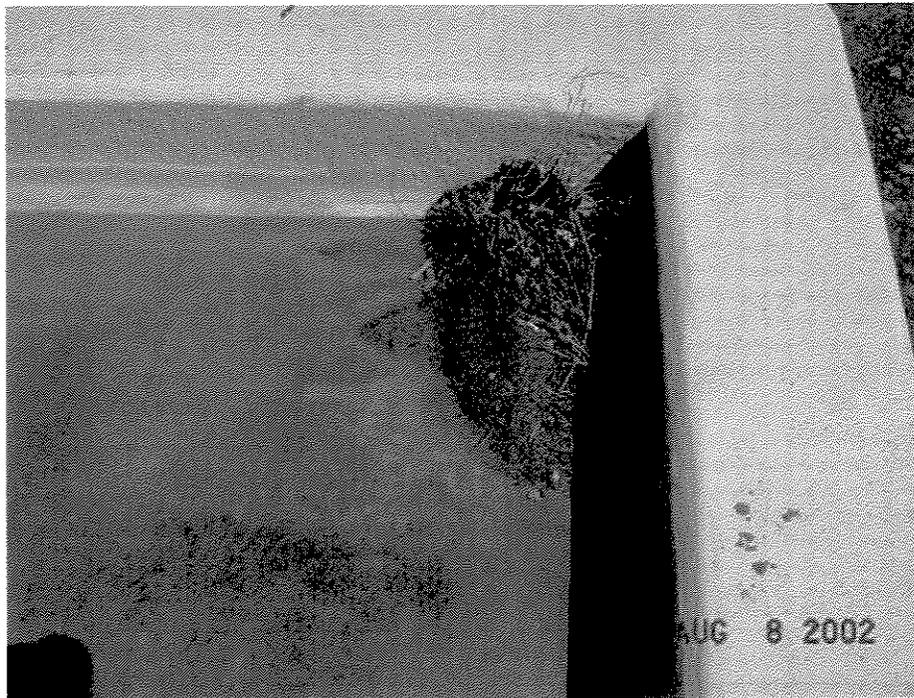


View from northeast. Tanks 2 cutting debris sample collection. Used saw blades on bottom right.



View from west. Crew sweeping Pad TA-54-35.

Figure 3. Photographs Documenting Closure Activities (Continued)



View from south. Northwest corner of Pad TA-54-35. Sweepings.



View from northwest. Crew decontaminating Pad TA-54-35. Sampler preparing sample labels for wash water samples.

Figure 3. Photographs Documenting Closure Activities (Continued)



View from northeast. Pad TA-54-35 decontamination round 2. Mixing washwater solution of water and Alconox.



View from southwest. Pad TA-54-35 decontamination round 2. First wash down. Mopping berm.

Figure 3. Photographs Documenting Closure Activities (Continued)



View from south. Pad TA-54-35 decontamination round 2. First wash down. Mopping pad.



View from northwest. Pad TA-54-35 decontamination round 2. First wash down. Collecting used wash water in 5 gallon carboy (same carboy used for round 1 decontamination activities performed on 8/8/02).

Figure 3. Photographs Documenting Closure Activities (Continued)

3.0 Quality Assurance

The QA of the closure activities is documented in this section through a description and evaluation of the quality of the closure activities and an evaluation of the quality of the analytical data obtained from the sampling of the tanks and Pad TA-54-35 decontamination wash water.

3.1 Closure Activities

This section describes closure-related activities performed between July 30, 2002, and September 5, 2002, as witnessed by the QA reviewer. Meetings and other correspondence (e.g., phone calls and electronic mail) to discuss closure activities began on June 28, 2002. The preliminary meetings were of an organizational nature and served an important function to ensure environmental compliance of the closure of the tanks. Topics discussed at the meetings included:

- Defining objectives to ensure compliance with the Closure Plan (LANL 2002)
- Defining the roles and responsibilities of subcontractor and LANL personnel who would be participating in the tank closure activities
- Assessment of the hazards associated with the tank closure to ensure the health and safety of personnel performing closure activities
- Defining sampling and analysis quality objectives to ensure valid sample data (e.g., sample collection, sample management, and chain of custody)
- Assuring adherence to the Closure Plan, Section 10.0, Sampling Activities (LANL 2002)

These meetings included telephone conversations with AALI, to ensure that analytical laboratory requirements were identified.

The QA reviewer personally observed all sampling activities and certifies that the activities were performed as described in the Closure Plan (LANL 2002) and summarized in Section 2.0. The QA reviewer also took photographs of closure activities, which are provided in Section 2.0.

3.2 Analytical Data Review

The analytical data submitted by AALI for the samples taken during closure activities are maintained by the facility. The QA/quality control (QC) review performed by AALI is accepted and documented below.

AALI provided the following QC narrative statements for the samples taken on August 8, 2002. The analytical results for these samples are provided in Section 2.6.1, Tables 3a, 3b, and Section 2.6.2, Table 4a.

- The samples were received on ice and in good condition.
- Initial and continuing calibrations met all QA/QC criteria for analytes of interest in all requested analyses.

- Samples for SW846-7000 series [Clean Bucket and Dirty Bucket samples in Table 4a] silver analysis were reported with a "B" due to contamination observed in the method blank. All other method blanks associated with the analyses were free of target analytes.
- The laboratory control sample (LCS)/LCS duplicate (LCSD) recoveries and relative percent differences (RPDs) associated with all analyses were within AALI's QC criteria limits.
- The matrix spike (MS), MS duplicate (MSD), and RPD for the SW846-7471 [Tank 1 and Tank 2 samples in Table 3a] mercury analysis were out of AALI's QC criteria due to matrix interference. The matrix of the sample appears to be holding onto the mercury; therefore implying that the result for sample 0208239-01A [Tank 1 total metals] may have a possible low bias.

[NOTE: This would also affect sample 0208239-02A (Tank 2 total metals) because they were run under the same QC samples.]

- The MS/MSD/RPD for the SW846-6010A [Tank 1 and Tank 2 samples in Table 3a] analysis were out of AALI's QC criteria for barium and chromium; the MSD and associated RPD were out of QC criteria for cadmium. The out-of-criteria elements listed are due to the amount of sample (1 gram) utilized for the analysis and the matrix prohibiting a homogeneous aliquot of the sample to be obtained.

AALI provided the following QC narrative statements for the samples taken on September 5, 2002. The analytical results for these samples are provided in Section 2.6.2, Table 4b.

- The samples were received on ice and in good condition.
- Initial and continuing calibrations met all QA/QC criteria for analytes of interest in all analyses requested.
- The method blank for the SW846-6010A analysis [Table 4b results] showed contamination at the detection limit for barium. This has no impact upon the reported data. All other method blanks associated with the analysis were free of target analytes.
- The LCS/LCSD recoveries and RPDs associated with all analyses were within AALI's QC criteria limits.
- All MS/MSD recoveries and RPDs associated with all analyses requested were within AALI's QC limits.

Sample holding times were within established parameters in SW-846 for each analytical method. The quality of the analytical data is ensured by the analytical laboratory routinely adding QC samples (e.g., LCSs, method blanks, MS) to the normal laboratory sample stream to demonstrate that the laboratory is operating within prescribed requirements for accuracy and precision.

Based on the QC narratives provided by AALI and the sampling activities described in Section 2.0 that ensured representative samples and sample integrity, the analytical data obtained should be accepted as valid and used to properly characterize the tanks, decontamination wash water, and closure-related wastes.

4.0 Certifications

4.1 Certification of Accuracy

For certification of this document, please see certification statement contained with the submittal of this certification report and it accompanying addendum "Hazardous Waste Treatment Storage Tank Sampling Summary Report for Pad TA-54-35 Sump at Material Disposal Area L, in Technical Area 54."

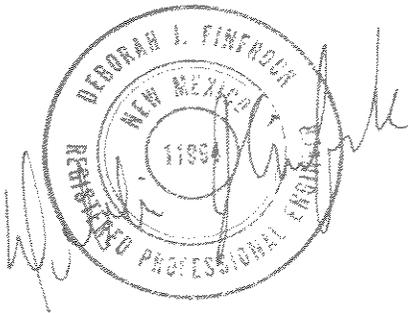
4.2 Independent Professional Engineering Certification

This certification was prepared in accordance with generally accepted professional engineering principles and practice pursuant to the requirements of 20.4.1 NMAC, Subpart V, 264.115, for an independent professional engineering certification. These services have been performed with the care and skill ordinarily exercised by members of the profession practicing under similar conditions at the same time and in the same or in a similar locality. I make no other warranty either expressed or implied. The finding and certification are based on (1) reviewing the Closure Plan dated July 2002 (LANL 2002); (2) being present during closure and sampling activities; and (3) reviewing the analytical results from the tank debris and Pad TA-54-35 decontamination wash water.

With the signature and seal below, I certify that, except for the variances presented in Section 2.7, the closure of the two treatment/storage tanks at TA-54, Area L was conducted substantially in accordance with the Closure Plan (LANL 2002). LANL disposed of the tanks and all closure-related waste according to the characterization based on the sampling and analysis. The information presented in this report is, to the best of my knowledge and belief, true, accurate, and complete.

Respectfully,

Eberline Services



Deborah Finfrock, P.E.

New Mexico Registered Professional Engineer No. 11994
Expires 12/04

Date: 6/25/03

4.3 QA Reviewer Certification

With the signature below, I certify that, except for the variances presented in Section 2.7, the closure of the two treatment/storage tanks at TA-54, Area L was conducted substantially in accordance with the Closure Plan (LANL 2002). LANL disposed of the tanks and all closure-related waste according to the characterization based on the sampling and analysis. The information presented in this report is, to the best of my knowledge and belief, true, accurate, and complete.

Respectfully,

A handwritten signature in cursive script that reads "Nicole Seguin" followed by the date "6/25/03".

Nicole Seguin, QA Specialist
Eberline Services

5.0 References

The following references (with the exception of 20.4.1 NMAC and EPA 1986) are maintained by the facility.

20.4.1 NMAC. *New Mexico Administrative Code*, Title 20, Chapter 4, Part 1, Subpart V, 264.115, "Certification of Closure."

EPA 1986, and all approved updates. *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846)*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, U.S. Government Printing Office, Washington, D.C.

IT 1996. Record of Meeting: TA-54, Area L Treatment Storage Tanks Closed in September 1994, December 5, 1996, International Technology Corporation, Los Alamos, New Mexico.

JCNNM 2002a. Hazard Analysis for the Area L Treatment/Storage Tank and Pad TA-54-35 Decontamination Wash Water Characterization, HENV-2002-01, July 24, 2002, Johnson Controls Northern New Mexico, Los Alamos, New Mexico.

JCNNM 2002b. JCNNM Industrial Hygiene Direct Reading Monitoring Record for the Demolition of Treatment Tanks, July 30, 2002, Johnson Controls Northern New Mexico, Los Alamos, New Mexico.

LANL 1993. *Detailed Operating Procedure for Treating Barium-Contaminated Sand at TA-54, Area L*, CW International Technology Corporation CMWO-EM7L-0009, April 7, 1993, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL 1994. *Safe Operating Procedure for Treating Barium-Contaminated Sand at TA-54, Area L*, SOP-CST7L-005,R.1, March 23, 1994, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL 2002. *Los Alamos National Laboratory Technical Area 54, Area L Closure Plan for Hazardous Waste Treatment/Storage Tanks EPA ID# NM0890010515*, LA-UR-02-4740, Revision 0.0, July 2002, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL 2003. Memorandum: New/Unused Tank Liners for Area L Barium Sands Treatment Tanks Closure, FWO-WFM 03-031, February 24, 2003, Los Alamos National Laboratory, Los Alamos, New Mexico.

NMED 1989. *Hazardous Waste Facility Permit*, NM 0890010515-1, 1989 with 1995 modifications, New Mexico Environment Department, Santa Fe, New Mexico.

6.0 Documentation

The following documentation is maintained by the facility.

Characterization documentation for barium-contaminated sand: Waste Profile Forms, Chemical Waste Disposal Requests.

Shipping documentation for the waste generated by the closure of the TA-54, Area L barium sands treatment tanks.

TA-54, Area L barium sands treatment tanks closure analytical data reports (received from Assaigai Analytical Laboratory, Inc.).

TA-54, Area L barium sands treatment tanks closure sampling logbook.

Treatment run log for the TA-54, Area L barium sands treatment/storage tanks.