ATTACHMENT G.19
TECHNICAL AREA 55, BUILDING 4 ROOM K13
INDOOR CONTAINER STORAGE UNIT
CLOSURE PLAN

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G.19-1	Technical Area 55, Building 4, Room K13 Indoor Container Storage Unit

1.0 INTRODUCTION

This closure plan describes the activities necessary to close the indoor hazardous waste container storage unit which is located in Room K13 in the basement of Technical Area 55, Building 4 (TA-55-4) at the Los Alamos National Laboratory (Facility), hereinafter referred to as the permitted unit. The information provided in this closure plan addresses the closure requirements specified in Permit Part 9, the Code of Federal Regulations (CFR), Title 40, Part 264, Subparts G and I for hazardous waste management units operated at the Facility under the Resource Conservation and Recovery Act (RCRA) and the New Mexico Hazardous Waste Act.

Until closure is complete and has been certified in accordance with Permit Section 9.5, a copy of the approved closure plan or the hazardous waste facility permit containing the plan, any approved revisions, and closure activity documentation associated with the closure will be on file with hazardous waste compliance personnel at the Facility and at the U.S. Department of Energy (DOE) Los Alamos Site Office. Prior to closure of the permitted unit, this closure plan may be amended in accordance with Permit Section 9.4.8, as necessary and appropriate, to provide updated sampling and analysis plans and to incorporate updated decontamination technologies. Amended closure plans shall be submitted to the New Mexico Environment Department (Department) for approval prior to implementing closure activities.

2.0 DESCRIPTION OF UNIT TO BE CLOSED

A specific description of the permitted unit can be found in Permit Attachment A (*Technical Area Unit Descriptions*). Additional features and equipment located at the permitted unit and not discussed elsewhere within the Permit are described below.

The permitted unit is rectangular shaped, is open on three sides, and measures 16 feet (ft) long by 13 ft wide. There is a pillar on one of the open sides. Equipment within the permitted unit used for hazardous waste management is identified on Figure G.19-1 (provided under separate cover). The waste stored at the permitted unit consists of hazardous and mixed waste in both solid and liquid form.

The permitted unit was constructed in 1979 and has been subject to waste management regulations under RCRA since July 25, 1990. Due to the scope of process operations at TA-55-4, the wastes stored include corrosive, reactive, and ignitable liquids, sludge, debris, and chemical wastes with metals and volatile and semi-volatile organic constituents.

Permit Part 3 (*Storage in Containers*), Permit Attachment A (*Technical Area Unit Descriptions*), Permit Attachment B (*Part A Application*), and Permit Attachment C (*Waste Analysis Plan)* include information regarding waste management procedures and hazardous waste constituents stored at the permitted unit.

3.0 ESTIMATE OF MAXIMUM WASTE STORED

Approximately five cubic meters of waste have been stored in the permitted unit. Throughout the life of this Permit it is estimated that an additional ten cubic meters of waste will be stored in the permitted unit.

4.0 GENERAL CLOSURE REQUIREMENTS

4.1 Closure Performance Standard

As required by Permit Section 9.2, the permitted unit will be closed to meet the following performance standards:

a. remove all hazardous waste residues and hazardous constituents; and

b. ensure contaminated media do not contain concentrations of hazardous constituents greater than the clean-up levels established in accordance with Permit Sections 11.4 and 11.5. For soils the cleanup levels shall be established based on residential use. The Permittees must also demonstrate that there is no potential to contaminate groundwater.

If the Permittees are unable to achieve either of the clean closure standards above, they must:

c. control hazardous waste residues, hazardous constituents, and, as applicable, contaminated media such that they do not exceed a total excess cancer risk of 10^{-5} for carcinogenic substances and, for non-carcinogenic substances, a target Hazard Index of 1.0 for human receptors, and meet Ecological Screening Levels established under Permit Section 11.5;

d. minimize the need for further maintenance;

e. control, minimize, or eliminate, to the extent necessary to protect human health and the environment, the post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground, groundwater, surface waters, or to the atmosphere; and

f. comply with the closure requirements of Permit Part 9 (*Closure*) and 40 CFR Part 264 Subparts G and I for container storage units.

Closure of the permitted unit will be deemed complete when: 1) all surfaces and equipment have been decontaminated, or otherwise properly disposed of; 2) closure has been certified by an independent, professional engineer licensed in the State of New Mexico; and 3) closure certification has been submitted to, and approved by, the Department.

4.2 Closure Schedule

This closure plan schedule is intended to address the closure requirements for the permitted unit within the authorized timeframe of the current Hazardous Waste Facility Permit (*see* Permit Section 9.4). The following section provides the schedule of closure activities (*see also* Table G.19-2 in this closure plan).

Notification of closure will occur at least 45 days before the Permittees expect to begin closure (*see* 40 CFR § 264.112(d)(1)) and closure activities will begin according to the requirements of 40 CFR 264.112(d)(2). However, pursuant to 40 CFR § 264.112(e), removing hazardous wastes and decontaminating or dismantling equipment in accordance with an approved closure plan may be conducted at any time before or after notification of closure. Notification of the structural assessment (assessment), as described in Section 5.2 of this closure plan, shall occur in accordance with Permit Section 9.4.6.2.

Within 90 days after the final receipt of hazardous waste, the permitted unit will be emptied of all stored waste. Within ten days of completing hazardous waste removal or within 100 days of the final receipt of hazardous waste the Permittees will complete the records review (review) and assessment and submit an amended closure plan, if necessary, to the Department for review and approval as a permit modification if necessary. Upon approval of the modified closure plan, if applicable, the Permittees will decontaminate unit surfaces and related equipment.

Decontamination verification sampling activities, and soil sampling if applicable, will be conducted to demonstrate that surfaces, related equipment, and soils, if applicable, at the permitted unit meet the closure performance standards in Permit Section 9.2.

All closure activities, including submittal of a final closure certification report to the Department for review and approval, will be completed within 180 days after the final receipt of waste. In the event that closure of the permitted unit cannot proceed according to schedule, the Permittees will notify the Department in accordance with the extension request requirements in Permit Section 9.4.1.1.

5.0 CLOSURE PROCEDURES

Closure activities at the permitted unit will include: removal of hazardous wastes; proper management and disposal of hazardous waste residues and contaminated structures and equipment associated with the permitted unit; verification that the closure performance standards in Permit Section 9.2 have been achieved; and submittal of a final closure certification report. The following sections describe closure activities applicable to the permitted unit.

5.1 Removal of Waste

In accordance with Permit Section 9.4.2, all stored hazardous wastes will be removed from the permitted unit scheduled for closure. Depending upon their size, containers will be removed with forklifts, container dollies, air pallets, or manually. Containers will be placed on flat bed trucks, trailers, or other appropriate vehicles for transport. Appropriate shipping documentation will accompany the wastes during transport. Containers holding hazardous wastes will be moved to a permitted on-site storage unit or a permitted off-site treatment, storage, or disposal facility.

5.2 Records Review and Structural Assessment

After waste removal and before starting closure decontamination and sampling activities, the Facility Operating and Inspection Records for the permitted unit will be reviewed and an assessment will be conducted to determine any previous finding(s) or action(s) that may influence closure activities or potential sampling locations.

5.2.1 Records Review

The Facility Operating and Inspection Records shall be reviewed as outlined in Permit Section 9.4.6.1. The goals of the review will be to:

a. confirm the specific hazardous waste constituents of concern; and

b. confirm additional sampling locations (*e.g.*, locations of spills or chronic conditions identified in the Operating and Inspection Records).

5.2.2 Structural Assessment

An assessment of the permitted unit's physical condition will be conducted in accordance with Permit Section 9.4.6.2. The assessment will include inspecting the floor and walls of the permitted unit for any existing cracks or conditions that indicate a potential for, or an actual, release of constituents. If a crack, gap, or stained area is present, the Permittees will amend this closure plan in order to update the sampling and analysis plan (SAP) (*see* Section 6.0 of this closure plan) to add these sampling locations and the

applicable sampling methods and procedures. This inspection will be documented with photographs and drawings, as necessary.

5.3 Decontamination and Removal of Structures and Related Equipment

In accordance with the procedures in Permit Section 9.4.3, all remaining hazardous waste and hazardous waste residues will be removed from the permitted unit. The permitted unit's structures and equipment will be decontaminated, or removed, or both and managed appropriately. All waste material will be controlled, handled, characterized, and disposed of in accordance with Permit Attachment C (*Waste Analysis Plan*), Permit Section 9.4.5, and Facility waste management procedures. Decontamination activities will ensure the removal of all hazardous waste residues and hazardous waste constituents from the permitted unit to meet the closure performance standards outlined in Permit Section 9.2.

5.3.1 Removal of Structures and Related Equipment

All structures and related equipment that are removed will not require decontamination, will be considered solid and potentially hazardous waste (as defined by this Permit) when removed, and will be disposed of in accordance with Permit Section 9.4.5 and Section 7.0 of this closure plan. The unit's three metal cabinets will be removed after the structural assessment.

5.3.2 Decontamination of Structures and Related Equipment

All surfaces, structures, and related equipment that will be left in place or reused by the Facility will be decontaminated in accordance with Permit Section 9.4.3.1. Decontamination of the permitted unit's surfaces will include all features located within the unit (*e.g.*, pillar). There is no equipment located at the permitted unit that is expected to be left in place; however, if there is equipment identified during the assessment that is expected to be left in place, it will be decontaminated in accordance with this section.

Decontamination of the permitted unit will be conducted by first removing loose material (*e.g.*, dust, dirt) through sweeping followed by washing using a manual wipe-down method with a solution consisting of a surfactant detergent (*e.g.*, Alconox®) and water mixed in accordance with the manufacturer's recommendations.

Wipe-down washing will be utilized because of the need to minimize the potential for exposure to workers and the migration of cleaning solution to other areas of the basement outside the permitted unit's boundary. Migration of the wash solution (in the form of splashing, condensation, or drainage) from steam cleaning or pressure washing may potentially contaminate or otherwise negatively affect ongoing operations within the basement. Migration can potentially be mitigated using plastic barriers taped to surfaces to enclose the area. However, areas enclosed in this manner will require workers to use additional personal protective equipment (PPE). This PPE will include fully enclosed protective wear and supplied air because of the increased risk of exposure to personnel due to potential release of radiological materials and organic compounds and concentration within the enclosure. Enclosure of the area increases the risk of personnel exhaustion, because of the additional PPE, and the potential for workers to reach radiological work exposure limits. Therefore, wipe-down washing, rather than steam cleaning or pressure washing, will be utilized because of the need to minimize the potential for exposure to workers and the migration of cleaning solution to other areas of the basement outside the permitted unit's boundary.

The entirety of the unit's floors will be decontaminated. Hazardous waste containers at the permitted unit are stacked. Including the height of any pallets that may have been used, two stacked 55-gallon drums and two stacked standard waste boxes measure just over eight feet high. Therefore, to ensure that

decontamination of the walls is conducted to a sufficient height, all walls in the permitted unit will be decontaminated to a height of 11 feet.

Ceilings of the permitted unit, walls above 11 feet, and the areas outside of the permitted unit will be presumed to be free of contamination unless there is some indication of contamination (*e.g.*, staining), the records review reveals that large amounts of liquid volatile or semi-volatile organic waste was stored in the permitted unit, or a spill or release occurred within the unit that could have affected the ceiling or the walls above 11 feet.

Cloths, or other absorbent cleaning devices, will not be reused to wipe down the surfaces after being wetted in the wash solution or after spraying solution onto the surfaces. Only one cloth or absorbent cleaning device will be used at a time in a single area to prevent cross-contamination. To minimize the amount of liquid waste generated as a result of decontamination activities, the wash solution will be dispersed from buckets, spray bottles, or other types of small containers.

Portable berms or other such devices (*e.g.*, absorbent socks, plastic sheeting, wading pools, existing secondary containment) will collect excess wash water and provide containment during the decontamination process.

5.4 Equipment Used During Decontamination Activities

Reusable protective clothing, tools, and equipment used during decontamination activities will be cleaned with a wash water solution. Residue, disposable equipment, and small reusable equipment that cannot be decontaminated will be containerized and managed as waste as summarized in Table G.19-3 and in accordance with Permit Section 9.4.5 and Section 7.0 of this closure plan.

6.0 SAMPLING AND ANALYSIS PLAN

This SAP addresses the specific closure sampling and analysis requirements in Permit Section 9.4.7 and describes the sampling, analysis, and quality assurance/quality control (QA/QC) methods that will be used to demonstrate that the Permittees have met the closure performance standards outlined in Permit Section 9.2.

6.1 Decontamination Verification Sampling Activities

Decontamination verification sampling activities will be conducted at the permitted unit in order to verify that surfaces and related equipment at the permitted unit meet the closure performance standards in Permit Section 9.2. All samples will be collected and analyzed in accordance with the procedures in Sections 6.2, 6.3, and 6.4 of this closure plan.

One wipe sample will be collected from each piece of decontaminated equipment at the permitted unit. In compliance with Permit Section 9.4.7.1.i, this closure plan will ensure the collection of at least one wipe sample from the floor and from the walls (up to 11 feet) of the permitted unit. Verification wipe samples will be collected from random locations within each of the sample areas indicated on Figure G.19-1 (provided under separate cover) of this closure plan. A total of five wipe samples will be collected: two from the floor; two from the wall; and one from the pillar.

Solid chip samples may be collected and analyzed to determine if residual hazardous constituents remain in the concrete floor at the permitted unit.

6.2 Sample Collection Procedures

Samples will be collected in accordance with Permit Section 9.4.7.1 and the procedures identified in this sampling and analysis plan which incorporates guidance from the United States Environmental Protection Agency (USEPA) (EPA, 2002), DOE (DOE, 1995), and other Department-approved procedures.

6.2.1 Wipe Sampling

Surface wipe samples will be collected and analyzed to determine if residual hazardous constituents remain on the surfaces and related equipment at the permitted unit. Samples will be collected in accordance with the National Institute of Occupational Safety and Health (NIOSH) *Manual of Analytical Methods* (NIOSH, 1994). The appropriate wipe sample method will consider the type of surface being sampled, the type of constituent being sampled for, the solution used, and the desired constituent concentration detection limit.

The NIOSH method includes wiping a 100 square centimeter area at each discrete location with a gauze wipe wetted with a liquid solution appropriate for the desired analysis (*e.g.*, deionized water for lead). For wipe sampling, guidance from the analytical laboratory must be obtained prior to wipe verification sampling to confirm that the solution chosen for each analysis is appropriate for the analysis to be conducted and that wipe sampling is a proper technique for the analysis.

6.2.2 Solid Chip Sampling

Solid chip samples may be collected and analyzed to determine if residual hazardous constituents remain in the concrete floor at the permitted unit. Any non-porous inclusions from the sampling location will be removed by brushing or wiping. Using a chisel, drill, hole saw, or similar tool, a minimum 100 grams of the sample will be collected to a depth of 2 cm, or to an alternate depth specified in the assessment and transferred to an appropriate sampling container. The holding time and the preservation techniques to be used for each analysis will be determined from Table G.19-5.

6.2.3 Cleaning of Sampling Equipment

Reusable sampling equipment will be cleaned and rinsed prior to use. Sampling equipment rinsate blanks will be collected and analyzed only if reusable sampling equipment is used. Reusable decontamination equipment, including protective clothing and tools, used during closure activities will be scraped as necessary to remove residue and cleaned with a wash water solution. Sampling equipment will be cleaned prior to each use with a wash solution, rinsed several times with tap water, and air-dried to prevent cross-contamination of samples. A disposable sampler is considered clean if still in a factory-sealed wrapper.

6.3 Sample Management Procedures

The following sections provide a description of sample documentation, sample handling, preservation, storage, packaging, and transportation requirements that will be followed during the sampling activities associated with the closure.

6.3.1 Sample Documentation

Sampling personnel will complete and maintain records to document sampling and analysis activities. Sample documentation will include sample identification numbers, chain-of-custody forms, analysis requested, sample logbooks detailing sample collection activities, and shipping forms (if necessary).

6.3.1.1 Chain-of-Custody

Chain-of-custody forms will be maintained by sampling personnel until samples are relinquished to the analytical laboratory. This will ensure the integrity of the samples and provide for an accurate and defensible written record of the sampling possession and handling from the time of collection until laboratory analysis. One chain-of-custody form may be used to document all of the samples collected from a single sampling event. The sample collector will be responsible for the integrity of the samples collected until properly transferred to another person. The EPA considers a sample to be in a person's custody if it is:

a. in a person's physical possession;

b. in view of the person in possession; or

c. secured by that person in a restricted access area to prevent tampering.

The sample collector will document all pertinent sample collection data. Individuals relinquishing or receiving custody of the samples will sign, date, and note the time on the analysis request and chain-of-custody form. A chain-of-custody form must accompany all samples from collection through laboratory analysis. The analytical laboratory will return the completed chain-of-custody form to the Facility and it will become part of the permanent sampling record documenting the sampling efforts.

6.3.1.2 Sample Labels and Custody Seals

A sample label will be affixed to each sample container. The sample label will include the following information:

a. a unique sample identification number;

b. name of the sample collector;

c. date and time of collection;

d. type of preservatives used, if any; and

e. location from which the sample was collected.

A custody seal will be placed on each sample container to detect unauthorized tampering with the samples. These labels must be initialed, dated, and affixed by the sample collector in such a manner that it is necessary to break the seal to open the container.

6.3.1.3 Sample Logbook

All pertinent information on the sampling effort must be recorded in a bound logbook. Information must be recorded in ink and any cross-outs must be made with a single line with the change initialed and dated by the author. The sample logbook will include the following information:

a. the sample location;

b. suspected composition;

c. sample identification number;

d. volume/mass of sample taken;

e. purpose of sampling;

f. description of sample point and sampling methodology;

g. date and time of collection;

h. name of the sample collector;

i. sample destination and how it will be transported;

j. observations; and

k. name(s) of personnel responsible for the observations.

6.3.2 Sample Handling, Preservation, and Storage

Samples will be collected and containerized in appropriate pre-cleaned sample containers. Table G.19-5 presents the requirements in *SW-846* (EPA, 1986) for sample containers, preservation techniques, and holding times. Samples that require cooling to 4 degrees Celsius will be placed in a cooler with ice or ice gel or in a refrigerator immediately upon collection.

6.3.3 Packaging and Transportation of Samples

All packaging and transportation activities will meet safety expectations, QA requirements, DOE Orders, and relevant local, state, and federal laws (including 10 CFR and 49 CFR). Appropriate Facility documents establish the requirements for packaging design, testing, acquisition, acceptance, use, maintenance, and decommissioning and for on-site, intra-site, and off-site shipment preparation and transportation of general commodities, hazardous materials, substances, wastes, and defense program materials.

Off-site transportation of samples will occur via private, contract, or common motor carrier, air carrier, or freight. All off-site transportation will be processed through the Facility packaging and transportation organization unless the shipper is specifically authorized through formal documentation by the packaging and transportation organization to independently tender shipments to common motor or air carriers.

6.4 Sample Analysis Requirements

Samples will be analyzed for all hazardous constituents listed in Appendix VIII of 40 CFR Part 261 and in Appendix IX of 40 CFR Part 264 that have been stored at the permitted unit over its operational history (*see* Table G.19-1). Table G.19-1 will be modified, as necessary, to incorporate changes as a result of the permitted unit's records review. Samples will be analyzed by an independent laboratory using the methods outlined in Table G.19-4. Analytes, test methods and instrumentation, target detection limits, and rationale for metals and organic analyses are presented in Table G.19-4. If any of the information from these tables has changed at the time of closure, the Permittees will amend this closure plan to update all methods in this SAP.

6.4.1 Analytical Laboratory Requirements

The analytical laboratory will perform the detailed qualitative and quantitative chemical analyses specified in Section 6.4.2. This analytical laboratory will have:

a. a documented comprehensive QA/QC program;

b. technical analytical expertise;

c. a document control and records management plan; and

d. the capability to perform data reduction, validation, and reporting.

The selection of the analytical testing methods identified in Table G.19-4 is based on the following considerations:

e. the physical form of the waste;

f. constituents of concern;

g. required detection limits (*e.g.*, regulatory thresholds); and

h. information requirements (*e.g.*, waste classification).

6.4.2 Quality Assurance/Quality Control

All sampling and analysis will be conducted in accordance with QA/QC procedures defined by the latest revision of "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (*SW-846*) (EPA, 1986) or other Department-approved procedures. Field sampling procedures and laboratory analyses will be evaluated through the use of QA/QC samples to assess the overall quality of the data produced. QC samples evaluate precision, accuracy, and potential sample contamination associated with the sampling and analysis process, and is described in the following sections, along with information on calculations necessary to evaluate the QC results.

6.4.2.1 Field Quality Control

The field QC samples that will be collected are trip blanks, field blanks, field duplicates, and equipment rinsate blanks. Table G.19-6 presents a summary of QC sample types, applicable analyses, frequency, and acceptance criteria. QC samples will be given a unique sample identification number and submitted to the analytical laboratory as blind samples. QC samples will be identified on the applicable forms so that the results can be applied to the associated sample.

6.4.2.2 Analytical Laboratory QC Samples

QA/QC considerations are an integral part of analytical laboratory operations. Laboratory QA ensures that analytical methods generate data that are technically sound and statistically valid and that can be documented. QC procedures are the tools employed to measure the degree to which these QA objectives are met.

6.4.3 Data Reduction, Verification, Validation, and Reporting

Analytical data generated by the activities described in this closure plan will be verified and validated. Data reduction is the conversion of raw data to reportable units, transfer of data between recording media, and computation of summary statistics, standard errors, confidence intervals, and statistical tests.

6.4.4 Data Reporting Requirements

Analytical results will include all pertinent information about the condition and appearance of the sample-as-received. Analytical reports will include:

a. a summary of analytical results for each sample;

b. results from QC samples such as blanks, spikes, and calibrations;

c. reference to standard methods or a detailed description of analytical procedures; and

d. raw data printouts for comparison with summaries.

The laboratory will describe sample preparations that occur during the analysis in sufficient detail so that the data user can understand how the sample was analyzed.

7.0 WASTE MANAGEMENT

All waste generated during closure will be controlled, handled, characterized, and disposed of in accordance with Permit Section 9.4.5, Permit Attachment C (*Waste Analysis Plan*), and Facility waste management procedures. Closure activities may generate different types of waste materials; these wastes are listed with potential disposal options in Table G.19-3 of this closure plan. Subsequent disposition options for the decontaminated structures and equipment include reuse, recycling, or disposal. Reusable protective clothing, tools, and equipment used during decontamination will be cleaned with a wash water solution. Disposable equipment and other small equipment that cannot be decontaminated will be containerized and managed as waste.

8.0 CLOSURE CERTIFICATION REPORT

Upon completion of the closure activities at the permitted unit, a closure certification report will be prepared and submitted to the Department for review and approval in accordance with Permit Section 9.5.

9.0 REFERENCES

DOE, 1995. "DOE Methods for Evaluating Environmental and Waste Management Samples," DOE/EM-0089T, Rev. 2. Prepared for the U.S. Department of Energy by Pacific Northwest Laboratory, Richland, Washington.

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

EPA, 2002. "RCRA Waste Sampling Draft Technical Guidance Planning, Implementation, and Assessment," EPA530-D-02-002, August 2002, Office of Solid Waste, U.S. Environmental Protection Agency, Washington, DC.

NIOSH, 1994. The National Institute for Occupational Health and Safety (NIOSH) *Manual of Analytical Methods*, 4th ed. Issue 1. 1994.

Table G.19-1

Hazardous Waste Constituents of Concern at the Technical Area 55, Building 4, Room K13, Indoor Container Storage Unit

Category	EPA Hazardous Waste Numbers	Specific Constituents
Toxic Inorganics	D004, D005, D006, D007, D008, D009, D010, D011	Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver
	F006	Wastewater treatment sludge
	P015, P056, P073 P113, P120	Beryllium powder, Fluorine , Nickel carbonyl, Thallic oxide, Vanadium oxide
	U151	Mercury
Organic Compounds	D018, D019, D021, D022, D027, D028, D029, D030, D032, D033, D034, D035, D036, , D037, D038, D039, D040, D041, D042, D043	Benzene; Carbon tetrachloride; Chlorobenzene; Chloroform; 1,4-Dichlorobenzene; 1,2-Dichloroethane; 1,1-Dichloroethylene; 2,4-Dinitrotoluene; Hexachlorobenzene; Hexachlorobutadiene; Hexachloroethane; Methyl ethyl ketone; Nitrobenzene; Pentachlorophenol; Pyridine; Tetrachloroethylene; Trichloroethylene; 2,4,5-Trichlorophenol; 2,4,6-Trichlorophenol; Vinyl chloride
	F001, F002, F003, F005	1,1,1-Trichloroethane; Carbon tetrachloride; Chlorinated fluorocarbons; Methylene Chloride; Tetrachloroethylene; Trichloroethylene; Trichlorofluoroethane; 1,1,1-Trichloroethane; 1,1,2-Trichloro-1,2,2-trifluoroethane; 1,1,2-Trichloroethane; Chlorobenzene; Freon tf; Methyl chloride; Methylene chloride; Ortho-dichlorobenzene; Tetrachloroethylene; Trichloroethylene; Trichloroflouromethane; Acetone; Ethyl ether; Methanol; Methyl isobutyl ketone; n-Butyl alcohol; Xylene; 2-Ethoxyethanol; 2-Nitropropane; Benzene; Carbon disulfide; Isobutanol; Methyl ethyl ketone; Pyridine; Toluene
	U002, U003, U019, U044, U056, U075, U080, U108, U117, U121, U123, U134, U154, U159, U165, U196, U210, U211, U213, U216, U220, U225, U226, U227, U228, U239	Acetone; Acetonitrile; Benzene; Chloroform; Cyclohexane; Dichlorodifluoromethane; Methane,dichloro-; 1,4-Dioxane; Ethane, 1,1'-oxybis-; Methane, trichlorofluoro-; Formic acid; Hydrofluoric acid; Methhanol; Methyl ethyl ketone; Naphthalene; Pyridine; Tetrachloroethylene; Methane, tetrachloro-; Furan, tetrahydro-; Thallium chloride; Toluene; Bromoform; Ethane, 1,1,1-trichloro-; 1,1,2-Trichloroethane; Trichloroethylene; Xylene
Cyanides	F007, F009	Cyanide plating bath solutions, Cyanide stripping cleaning solutions
	P030	Soluble cyanide salts, unspecified

[a] Based on the unit Operating Record

Table G.19-2

Closure Schedule for the Technical Area 55, Building 4, Room K13, Indoor Container Storage Unit

Activity	Maximum Time Required
Notify the Department of intent to close.	-45 Days
Final receipt of waste.	Day 0
Complete waste removal.	Day 90
Complete records review and structural assessment.	10 days after completed waste removal or 100 days after final receipt of waste
Complete all closure activities and submit final closure certification report to the Department.	Day 180

Table G.19-3

Potential Waste Materials, Waste Types, and Disposal Options

Potential Waste Materials	Waste Types	Disposal Options
Personal protective equipment (PPE)	Non-regulated solid waste	Subtitle D landfill
	Hazardous waste	The PPE will be treated to meet Land Disposal Restriction (LDR) treatment standards, if necessary, and disposed in a Subtitle C or D landfill, as appropriate.
	Low-level radioactive solid waste	Either an authorized on-site radioactive waste disposal area that is not undergoing closure under RCRA or its state analog, or an authorized off-site radioactive waste disposal facility.
	Mixed waste	Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill or the Waste Isolation Pilot Plant (WIPP), as appropriate.
Decontamination wash water	Non-regulated liquid waste	Sanitary sewer
	Hazardous waste	Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill, as appropriate.
	Radioactive liquid waste	Radioactive Liquid Waste Treatment Facility (RLWTF)
	Mixed waste	Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill or WIPP, as appropriate.
Metal	Non-regulated solid waste	Subtitle D landfill or recycled
	Hazardous waste	Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill, as appropriate.
	Low-level radioactive solid waste	Either an authorized on-site radioactive waste disposal area that is not undergoing closure under RCRA or its state analog, or an authorized off-site radioactive waste disposal facility.
	Mixed waste	Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill, or WIPP, as appropriate.
Discarded concrete	Low-level radioactive solid waste	Either an authorized on-site radioactive waste disposal area that is not undergoing closure under RCRA or its state analog, or an authorized off-site radioactive waste disposal facility.
	Mixed waste	Waste will be treated to meet LDR treatment standards,

Potential Waste Materials	Waste Types	Disposal Options
		if necessary, and disposed in a Subtitle C or D landfill or WIPP, as appropriate.
	Non-regulated solid waste	Subtitle D landfill, recycled, or reused
	Hazardous waste	Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill, as appropriate.
Discarded waste management equipment	Low-level radioactive solid waste	Either an authorized on-site radioactive waste disposal area that is not undergoing closure under RCRA or its state analog, or an authorized off-site radioactive waste disposal facility.
	Mixed waste	Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill or WIPP, as appropriate.
	Non-regulated solid waste	Subtitle D landfill
	Hazardous waste	Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill, as appropriate.
Sampling equipment	Low-level radioactive solid waste	Either an authorized on-site radioactive waste disposal area that is not undergoing closure under RCRA or its state analog, or an authorized off-site radioactive waste disposal facility.
	Mixed waste	Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill or WIPP, as appropriate.
	Non-regulated solid waste	Subtitle D landfill
	Hazardous waste	Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill, as appropriate.

Table G.19-4

Summary of Analytical Methods

Analyte	EPA *SW-846* Analytical Method [a]	Test Methods/ Instrumentation	Target Detection Limit [b]	Rationale
Metal Analysis				
Arsenic	7060A [c], 7061A	FLAA, GFAA	10 ug/L	Determine the metal concentration in the samples.
Barium	7080A [d], 7081 [c]	FLAA,GFAA	200 ug/L	
Cadmium	7130 [d], 7131A [c]	FLAA, GFAA	2 ug/L	
Chromium	7190 [d], 7191 [c]	FLAA, GFAA	10 ug/L	
Lead	7420 [d], 7421 [c]	FLAA, GFAA	5 ug/L	
Mercury	7470A, 7471A [e]	CVAA	0.2 ug/L	
Selenium	7740[c], 7741A	FLAA, GFAA	5 ug/L	
Silver	7760A[d], 7761 [c]	FLAA, GFAA	10 ug/L	
Organic Analysis				
Target compound list VOCs plus ten tentatively identified compounds (TIC)	8260B	GC/MS	10 mg/L	Determine the VOCs concentration in the samples.
Target compound list SVOCs plus 20 TICs	8270D [c]	GC/MS	10 mg/L	Determine the SVOCs concentration in the samples.

[a] U.S. Environmental Protection Agency (EPA), 1986 and all approved updates, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," *SW-846*.
[b] Detection limits listed for metals are for clean water. Detection limits for organics are expressed as practical quantitation limits. Actual detection limits may be higher depending on sample composition and matrix type.
[c] Method being integrated into Method 7010, per the May 1998 *SW-846* Draft Update IVA.
[d] Method being integrated into Method 7000B, per the May 1998 *SW-846* Draft Update IVA.
[e] Method being revised to 7471B per the May 1998 *SW-846* Draft Update IVA.
CVAA = Cold-vapor atomic absorption spectroscopy
FLAA = Flame atomic absorption spectroscopy
GC/MS = Gas chromatography/mass spectrometry
GFAA = Graphite furnace atomic absorption spectroscopy
mg/L = milligrams per liter
ug/L = micrograms per liter.

Table G.19-5

Sample Containers[a], Preservation Techniques, and Holding Times[b]

Analyte Class and Sample Type	Container Type and Materials	Preservation	Holding Time
Metals			
TCLP/Total Metals: Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver	Aqueous Media: 500-mL Wide Mouth-Polyethylene or Glass with Teflon Liner	Aqueous Media: HNO_3 to pH <2 Cool to 4 °C	180 Days
	Solid Media: 125-mL Glass	Solid Media: Cool to 4 °C	
TCLP/Total Mercury	Aqueous Media: 500-mL Wide Mouth-Polyethylene or Glass with Teflon Liner	Aqueous Media: HNO_3 to pH <2 Cool to 4 °C	28 Days
	Solid Media: 125-mL Glass	Solid Media: Cool to 4 °C	
Volatile Organic Compounds			
Target Compound Volatile Organic Compounds	Aqueous Media: Two 40-mL Amber Glass Vials with Teflon-Lined Septa	Aqueous Media: HCl to pH<2 Cool to 4 °C	14 days
	Solid Media: 125-mL Glass or Two 40-mL Amber Glass Vials with Teflon-Lined Septa	Solid Media Cool to 4 °C Add 5 mL Methanol or Other Water Miscible Organic Solvent to 40-mL Glass Vials	
Semi-Volatile Organic Compounds			
Target Compound Semi-volatile Organic Compounds	Aqueous Media: Four 1-L Amber Glass with Teflon-Lined Lid	Aqueous Media: Cool to 4 °C	Seven days from field collection to preparative extraction. 40 days from preparative extraction to determinative analysis.
	Solid Media: 250-mL Glass	Solid Media: Cool to 4 °C	

[a] Smaller sample containers may be required due to health and safety concerns associated with potential radiation exposure, transportation requirements, and waste management considerations.

[b] Information obtained from "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," *SW-846*, U.S. Environmental Protection Agency, 1986 and all approved updates.

°C = degrees Celsius
HCl = hydrochloric acid
mL = milliter
HNO_3=nitric acid
L = Liter
TCLP = Toxicity Characteristic Leaching Procedure

Table G.19-6
Quality Control Sample Types, Applicable Analyses, Frequency, and Acceptance Criteria

QC Sample Type	Applicable Analysis [a]	Frequency	Acceptance Criteria
Trip Blank	VOC	One set per shipping cooler containing samples to be analyzed for VOCs	Not Applicable
Field Blank	VOC/SVOC, metals	One sample daily per analysis	Not Applicable
Field Duplicate	Chemical	One for each sampling sequence	Relative percent difference less than or equal to 20 percent
Equipment Rinsate Blank[b]	VOC/SVOC, metals	One sample daily	Not Applicable

[a] For VOC and SVOC analysis, if blank shows detectable levels of any common laboratory contaminant (*e.g.*, methylene chloride, acetone, 2-butanone, toluene, and/or any phthalate ester), sample must exhibit that contaminant at a level 10 times the quantitation limit to be considered detectable. For all other contaminants, sample must exhibit the contaminant at a level 5 times the quantitation level to be considered detectable.

[b] Collected only if reusable sampling equipment used.

Figure G.19-1 has been provided under separate cover