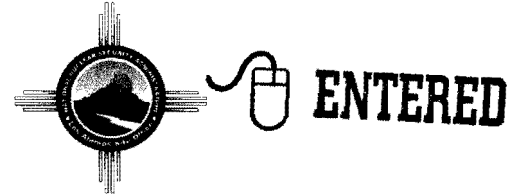


TA3



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Date: April 7, 2009  
Refer To: ENV-RCRA-09-060  
LAUR: 09-01924

Mr. John Kieling  
Hazardous Waste Bureau  
New Mexico Environment Department  
2905 Rodeo Park Drive East, Building 1  
Santa Fe, New Mexico 87505-6303



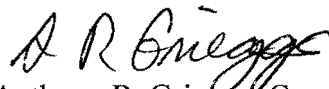
Dear Mr. Kieling:

**SUBJECT: TRANSMITTAL OF THE TECHNICAL AREA 3, BUILDING 29 PERMITTED UNIT CLOSURE PLAN**

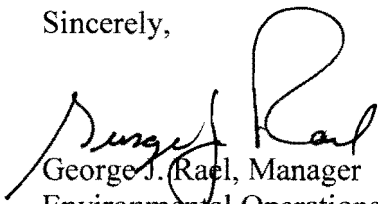
The purpose of this letter is to transmit for your review the closure plan for the Technical Area 3, Building 29 (TA-3-29) Container Storage Permitted Unit. The enclosed closure plan was developed for inclusion into the draft Los Alamos National Laboratory Hazardous Waste Facility Permit. As discussed on April 6, 2009 this is intended to serve as a formal submittal for a document that was transmitted to your office on March 27, 2009.

Enclosed is a hard copy and an electronic copy of the document. If you have any questions on this plan, or would like to discuss this further, please contact Jack Ellvinger at (505) 667-0633 or Gene Turner at (505) 667-5794.

Sincerely,

  
Anthony R. Grieggs, Group Leader  
Water Quality & RCRA Group  
Los Alamos National Laboratory

Sincerely,

  
George J. Rael, Manager  
Environmental Operations  
Los Alamos Site Office



Mr. John Kieling  
ENV-RCRA-09-060

-2-

April 7, 2009

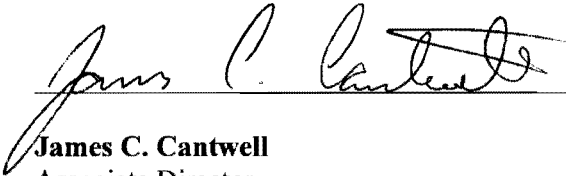
ARG:GR:LVH/lm

Enclosure: a/s

Cy: James Bearzi, NMED/HWB, Santa Fe, NM, w/o enc.  
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ENV-DO, File, w/o enc., J978  
ENV-RCRA, File, w/enc., K490  
IRM-RMMSO, w/enc., A150

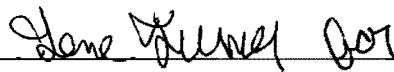
**CERTIFICATION**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

  
\_\_\_\_\_

**James C. Cantwell**  
Associate Director  
Associate Directorate Environment, Safety, Health, & Quality  
Los Alamos National Laboratory  
Operator

4/7/09  
Date Signed

  
\_\_\_\_\_

**Donald L. Winchell Jr.**  
Manager, Los Alamos Site Office  
National Nuclear Security Administration  
U.S. Department of Energy  
Owner/Operator

4/15/09  
Date Signed

**ATTACHMENT G.1**  
**TECHNICAL AREA 3, BUILDING 29**  
**CONTAINER STORAGE PERMITTED UNIT**  
**CLOSURE PLAN**

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**TECHNICAL AREA 3, BUILDING 29 PERMITTED UNIT**  
**ATTACHMENT G.1**  
**CLOSURE PLAN**

1.0 INTRODUCTION

This closure plan describes the activities necessary to close the hazardous waste storage unit within Room 9010 and portions of Rooms 9020 and 9030 at Technical Area 3, Building 29 (TA-3-29), at the Los Alamos National Laboratory (LANL), hereinafter referred to as the TA-3-29 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 waste management units operated at LANL 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 Part 9.4 and 40 CFR §264.115, 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 LANL and at the U.S. Department of Energy (DOE) Los Alamos Site Office. Prior to closure of a specific unit this closure plan may be amended in accordance with permit Section 9.3.7, as necessary and appropriate, to provide updated sampling or analysis plans or to incorporate updated decontamination technologies, and shall be submitted to the New Mexico Environment Department (the Department) for approval prior to implementing closure activities.

2.0 DESCRIPTION OF UNIT TO BE CLOSED

A specific description of the LANL Facility as a whole and the TA-3-29 Permitted Unit can be found in Attachment A of this Permit. Figures depicting the areas where container storage occurs at the TA-3-29 Permitted Unit are included as Figures G.1-1, G.1-2, and G.1-3. Additional features and equipment located at the unit and not discussed elsewhere within the Permit are described below.

The entire lower floor of TA-3-29, Room 9010 has been used for storage of hazardous waste. The room measures 106 feet (ft), 9 inches (in.), by 21 ft, 8 in. and currently contains two enclosures as described in Attachment A of this Permit. The room also contains two stairways and a ramped area that leads to raised rooms (Rooms 9008 and 9011) that are not part of the permitted unit. The portion of the ramp that exists within Room 9010, will be decontaminated (Section 5.5.1) along with the floor of the room. The wall of Room 9010 that is adjacent to Room 9008 and 9011 ranges in height due to connection to these rooms.

Starting from the north end, there are a set of steps that are approximately 36” wide leading to a 48” high wall with a 42” high hand rail running on this stretch. The shortened wall runs approximately 68” to the south. For the remaining distance behind the north enclosure within the room, the wall runs from floor to ceiling for a length of approximately 18 ft. south of this wall is the ramp which is 48” tall. The 48” tall wall continues behind the south enclosure and runs the entire length of the enclosure. There are no hand rails behind the enclosure; however, 42” hand rails exist where the wall extends past the enclosure. At the end of the southern end of the southern enclosure is another set of steps. These features have been included in the plan view only on Figure G.1-1 to lessen confusion on the three-dimensional view of the room.

The portion of TA-3-29, Room 9020 that is used for waste storage is comprised of a part of the entire room consisting of a portion of floor, a portion of a wall, and a chain link fence. Also within the Room 9020 storage area, is a floor drain that is connected to the Technical Area 50 Radiological Liquid Waste Facility. This drain is a design feature of the facility to protect facility and programmatic equipment in the event of a water release within the basement of TA-3-29. The drain will be required for facility use after closure of the TA-3-29 Permitted Unit and any waste containers with liquids stored at the TA-3-29 Permitted Unit would be stored on secondary containment and not directly on the floor of the unit. There is no record of a waste release to the drain.

The waste typically stored at the TA-3-29 Permitted Unit consists generally of mixed waste in both liquid and solid form since 1990 and has been subject to waste management conditions under the Resource Conservation and Recovery Act since July 25, 1990. Due to the scope of process operations at TA-3-29, the stored wastes include corrosive liquids, sludge, debris, and chemical wastes with metals and volatile and semi-volatile organic constituents. Specific hazardous waste constituents managed are included in Tables G.1-1, G.1-2, and G.1-3. Other information on the TA-3-29 Permitted Unit, including and pictures and figures of the unit are provided in the “Los Alamos National Laboratory General Part A Permit Application,” Revision 6.0 (LANL, 2009) and Figure XX of this Permit. Permit Part 3(*Storage in Containers*), Attachment A (*General Facility and TA-Specific Description*), and Attachment C (*Waste Analysis Plan*) of this Permit include further information about waste management procedures and hazardous waste constituents stored at the TA-3-29 Permitted Unit.

### 3.0 ESTIMATE OF MAXIMUM WASTE STORED

Over the history of waste storage in TA-3-29, Room 9010, approximately 50 cubic meters of waste have been stored in this unit. Approximately 70 cubic meters of waste have been handled in the portion of TA-LA-UR-09-01924

3-29, Room 9020 used for waste storage. The portion used for waste storage at TA-3-29, Room 9030 has stored approximately 10 cubic meters of waste. Estimates of future volumes are based on the numbers mentioned above for all areas within the permitted unit. Throughout the life of this permit, it is estimated that 27 cubic meters of waste will be stored at TA-3-29, Room 9010; 38 cubic meters of waste will be stored at the portion of TA-3-29, Room 9020 used for waste storage; and 5 cubic meters of waste will be stored at the portion of TA-3-29, Room 9030 used for waste storage.

#### 4.0 GENERAL CLOSURE INFORMATION

##### 4.1 Closure Performance Standard

As required by Permit Part 9.1 and 40 CFR §264.111, TA-3-29 will be closed to meet the following performance standards:

- Minimize the need for further maintenance;
- 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, or surface waters, or to the atmosphere; and
- Comply with the closure requirements of 40 CFR Part 264, Subparts G and I for container storage units, and Part 9 (*Closure*) of this Permit.

Removal of hazardous waste and hazardous waste residues from the permitted unit, decontamination and decommissioning of the surfaces and equipment that may have come into contact with the waste, and or disposal of contaminated structures or equipment. Decontamination activities will ensure the removal of hazardous waste residues from the TA-3-29 Permitted Unit to established cleanup levels as outlined in Section 6.0 of this closure plan. Verification sampling will be performed after decontamination to assess the potential for residual contamination at the closure site. If sampling indicates contamination, the level of such contamination will be evaluated for further decontamination activities or the implementation of an alternative demonstration of closure.

Closure of the unit will be deemed complete when 1) all surfaces and equipment have been decontaminated, or otherwise properly disposed of, if necessary; 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 is intended to address closure requirements for the unit within the authorized timeframe of the current Hazardous Waste Facility Permit. 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. Closure activities will begin according to the requirements of 40 CFR §264.112(d)(2). Treatment, removal, or disposal of hazardous wastes will begin in accordance with the approved closure plan, as required by 40 CFR §264.113(a), within 90 days after final receipt of waste at the permitted unit. This timeframe will be met as long as facilities are available for storage, treatment, or disposal of these wastes. In the event that closure activities cannot begin within 90 days, LANL will notify the Department in accordance with the extension requirements in 40 CFR §264.113(a). In addition, the demonstrations in 40 CFR §264.113(a)(1) and (b)(1), will be made in accordance with 40 CFR §264.113(c). Closure activities and reporting requirements will be completed within 180 days of receipt of the final volume of waste at the unit.

Closure will be conducted in accordance with the following schedule and as presented in Table G.1-4 of this closure plan. LANL will notify the Department of the intent to close the unit and to conduct a pre-closure assessment described in Section 5.2. Upon completion of the assessment, an amended closure plan will be submitted to the Department for approval as a permit modification if necessary. Upon approval of the assessment or the modified closure plan as applicable, LANL will begin closure activities. Within five days of beginning the closure, the unit will be emptied of any stored waste and decontamination of unit surfaces or equipment will begin. This decontamination or removal phase of the closure will be completed within 20 days. After this phase, sampling will be conducted to demonstrate that decontamination of the unit has occurred and depending upon the results, additional decontamination and sampling activities will be scheduled or decontamination will be determined. These activities will be completed within 140 days of the beginning of closure or the schedule (via a permit modification) will be adjusted if the closure plan requires amending. If the closure plan is not amended, a final closure certification report will be submitted to the Department within 180 days.

In the event that closure of the TA-3-29 Permitted Unit cannot proceed according to schedule, LANL will notify the Secretary of the Department in accordance with the extension request requirements in Permit Part 9.3.1 and 40 CFR §264.113(b).

## 5.0 CLOSURE PROCEDURES

Closure activities at the TA-3-29 Permitted Unit will involve removal of hazardous wastes; proper management and disposal of hazardous waste residues and contaminated equipment associated with the permitted unit; and verification that the closure performance standards have been achieved. Figure G.1-4 provides an outline of the general procedures that will be conducted and the general decision-making strategy for the closure activities. The following sections describe the general closure procedures applicable to the TA-3-29 Permitted Unit.

### 5.1 Removal of Waste

Prior to initiation of closure activities, all containerized wastes will be removed from the permitted unit scheduled for closure. Containers will be removed with forklifts, container dollies, air pallets, or manually depending upon their size. Containers will be placed on flat bed trucks, trailers, or other appropriate vehicles for transport. Appropriate shipping papers will accompany the wastes during transport. Containers holding hazardous wastes will be moved to an approved on-site storage unit or a permitted off-site treatment, storage, or disposal facility.

At closure, all remaining hazardous waste and hazardous waste residues will be removed from the TA-3-29 Permitted Unit. Unit structures and equipment contaminated with hazardous waste or hazardous waste residues will be decontaminated or removed and managed appropriately. All waste material will be controlled, handled, characterized, and dispositioned in accordance with Attachment C of this Permit and LANL waste management procedures. Section 11.0 discusses the potential waste materials that may be generated during closure, possible waste type(s), and disposal options.

### 5.2 Records Review and Structural Assessment

Before starting closure decontamination and sampling activities, the operating and inspection records for the waste management units will be reviewed to determine any previous finding(s) or action(s) that may influence closure activities or potential sampling locations. The Operating Record shall be reviewed as outlined in Permit Part 9.3.5. Goals of this review and inspection will be to:

- confirm the specific hazardous waste constituents of concern;
- confirm sampling locations at the storage unit by identifying if there have been any spills or chronic conditions in the operating record or stained areas at the unit that would indicate the type and location of released constituents; and

- differentiate equipment or other materials that will undergo decontamination from those to be recycled or reused, or managed as waste.

Tables G.1-1, G.1-2, and G.1-3 include a list of Environmental Protection Agency (EPA) Hazardous Waste Numbers that have been managed at each of the areas that make up the TA-3-29 Permitted Unit. Paths forward (disposal or decontamination) for equipment and surfaces at the units, and locations and types of clean up verification sampling will be confirmed during this assessment. Locations for verification samples for each of the surfaces of the unit are illustrated on Figures G.1-1, G.1-2, and G.1-3.

At least weekly, preventive maintenance inspections are conducted at the TA-3-29 Permitted Unit while waste is in storage. If any defects, deterioration, damage, or hazards affecting containment developed, appropriate remedial actions (including sampling, repairs, maintenance, or replacement) are completed and noted in the inspection record. This information will be reviewed to determine whether these activities have resulted in conditions affecting the closure or determination of sampling needs.

Prior to beginning any decontamination activities at the TA-3-29 Permitted Unit, the floor and walls will be inspected for any existing cracks or conditions that indicate a potential for release of contaminants as described in Permit Part 9.3.5. Floors, walls, and equipment within the unit will be assessed for evidence of release. This inspection will be documented with photographs and drawings, as necessary. If a crack, gap, or stained area is present, the operating record will be reviewed to determine the possible presence or release of contamination. If contamination could be present, a wipe sample or a representative sample of the media (e.g., concrete) will be taken and analyzed for the potential hazardous constituents identified during the assessment and listed in Tables G.1-1, G.1-2, and G.1-3 and following the procedures in Section 8.0. If contamination is present, the surface flaw will be decontaminated to meet, as necessary, the applicable requirements for disposition (e.g., leaving in place, reuse, or disposal). Material may be partially or completely removed until contamination is no longer detected or it is established that decontamination cannot be achieved and an alternative demonstration of closure as described in Section 6.1 must be implemented.

### 5.3 Removal of Equipment

All materials (surfaces and equipment) that are removed (or cannot be decontaminated) will be solid and potentially hazardous wastes when removed and will be managed as described in Section 11.0 of this closure plan and Permit Part 9.3.4. All small equipment located at the units, the enclosures within room

9010, and the chain-link fence that runs along one side of 9020 will be removed and disposed of in accordance with this section.

#### 5.4 Decontamination and Verification of Decontamination of Equipment

All equipment that will be left in place or reused by the Facility will be decontaminated. At this time there is no equipment located at the unit that is expected to be decontaminated; however, if equipment is identified during the structural assessment (described in Section 5.2) it will be decontaminated in accordance with this section. Sampling and analysis will be performed to verify that decontaminated equipment and structures meet the verification criteria specified in Section 6.0 of this closure plan. All sampling during decontamination and other closure activities will be conducted in accordance with quality assurance (QA)/quality control (QC) procedures defined by the latest revision of “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods” (SW-846) (EPA, 1986).

Equipment at the TA-3-29 Permitted Unit to be decontaminated will be cleaned using a solution consisting of a surfactant detergent (e.g., Alconox<sup>®</sup>) and water mixed in accordance with manufacturer recommendations. Wipe-down washing of the equipment within the TA-3-29 Permitted Unit will be utilized because special concerns must be taken into account to minimize the amount of waste generated, minimize the potential for exposure to workers, and minimize the migration of cleaning solution to other areas of the basement outside the unit boundary. Cloths or other absorbent cleaning devices will be used to wipe down the surfaces after being wetted in the wash solution or after spraying solution onto the surfaces. 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 devices (e.g., absorbent socks, plastic sheeting, wading pools, or existing secondary containment) designed to collect and provide containment will collect excess water and provide containment during the decontamination process.

Verification samples will be collected from each piece of decontaminated equipment. A single wipe sample will be collected from each piece of equipment that was decontaminated. Wipe samples will be collected in accordance with the procedure in Section 8.1 of this closure plan.

#### 5.5 Decontamination and Verification of Decontamination of Unit Surfaces

The surfaces (e.g., floors and walls) of Room 9010 and portions of Room 9020 and 9030 will be decontaminated. The entirety of the floor and the walls to a height of 1 ft above the highest level of waste previously stored in the unit will be decontaminated. Waste at the TA-3-29 Permitted Unit is no longer

stacked higher than one container high; however, past activities have allowed the stacking of 55-gallon drums two high. Including the height of any pallets that may have been used, 55-gallon drums stacked two high measure just over 6 ft high. To ensure that decontamination of the walls is conducted to a sufficient height, all walls included as part of the permitted unit will be decontaminated to a height of 8ft where possible. Decontamination of the floors and walls of the TA-3-29 Permitted Unit will be conducted by first removing loose material through sweeping then by washing using a wipe-down method. Ceilings of the permitted unit, walls above the determined decontamination height, and area outside of the unit will be presumed to be free of contamination unless there is some indication of contamination, the operating record review reveals that large amounts of liquid volatile organic waste was stored in the unit, or a spill or release occurred within the unit that could have affected high on the walls or on the ceiling.

Decontamination of the floors and walls of the TA-3-29 Permitted Unit will consist of washing with a solution consisting of a surfactant detergent (e.g., Alconox<sup>®</sup>) and water mixed in accordance with manufacturer recommendations. Wipe-down washing will be utilized at the TA-3-29 Permitted Unit because it is located in the basement of a nuclear facility. Special concerns must be taken into account to minimize the amount of waste generated, minimize the potential for exposure to workers, and minimize the migration of cleaning solution to other areas of the basement outside the unit boundary. Mops, cloths, or other absorbent cleaning devices will be used to wipe down the surfaces after being wetted in the wash solution or after spraying solution onto the surfaces. 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 devices, if necessary, will be used to collect excess wash water and provide containment during the decontamination procedure. After decontamination of the surfaces, any excess wash water will be transferred to containers for characterization and disposition and any containment system used will be wiped down. In the event that washing is not sufficient to decontaminate the unit (e.g., staining or residues persist that are determined to be significant), other methods of cleaning (or removal of the surface) will be evaluated and used as approved by the Department.

When decontamination of the permitted unit is complete, verification of decontamination will be conducted. If sampling and analyses indicate that hazardous waste constituents are present above acceptable levels, the wash cycles and verification analyses will continue until the structures (and its associated equipment) have been decontaminated or the decision, in conjunction with the Department, is made to proceed with an alternative demonstration of closure, as described in Section 6.1.



Verification samples will be collected from each surface of each area that make up the TA-3-29 Permitted Unit. Wipe samples will be collected from a random location with each of the sample areas indicated on Figures G.1-1, G.1-2, and G.1-3 in accordance with the procedure in Section 8.1 of this closure plan and analyzed for the appropriate constituents indicated in Tables G.1-1, G.1-2, and G.1-3. Analysis of wipe samples will be conducted for the inorganic analytes and appropriate organic constituents. Other organic constituents will be presumed to have been removed during the wipe-down decontamination process due to the surfactant nature of the detergent within the wash solution.

#### 5.5.1 Decontamination and Verification of Decontamination for Room 9010

The entire floor of TA-3-29-9010 the wipe-down method described in Section 5.5. Three of the four walls within the room will be decontaminated to a height of 8 ft. The final wall within the room consists partially of a full floor to ceiling wall and a short wall (4 ft) and railing. This wall will be decontaminated to a height of 8 feet where possible and the complete height of the wall will be decontaminated where it measures 4 ft high. The railing will not be decontaminated. No waste was ever stored in the separate rooms on the other side of the railing (Rooms 9008 and 9011) and they are not part of the permitted unit. The concrete ramp located within the room will be decontaminated via the same method used for the floor and walls of the room. The two stairways within the room will not be decontaminated.

Verification wipe samples will be collected from a random location with each of the sample areas indicated on Figure G.1-1 in accordance with the procedure in Section 8.1 of this closure plan and analyzed for the appropriate constituents indicated in Table G.1-1. A total of ten wipe samples will be collected. Four wipe samples from the floor, two wipe samples from each of the longer walls, and one wipe sample from each of the shorter walls will be collected. Verification sampling will be conducted for the floor first and then the walls to prevent cross contamination of the samples and allow for the identification of contaminated areas. Additional samples may be collected based on the records review and structural assessment described in Section 5.2.

#### 5.5.2 Decontamination and Verification of Decontamination for Room 9020

The entire demarcated portion of the floor within TA-3-29-9020 will be decontaminated using the wipe-down method described in Section 5.5. The wall within the area of the room used for storage of hazardous waste will be decontaminated to a height of 8 feet. During decontamination activities special care will be taken to ensure that none of the wash solution enters the firewater drain located on the floor of the unit.

Verification wipe samples will be collected from a random location with each of the sample areas indicated on Figure G.1-2 in accordance with the procedure in Section 8.1 of this closure plan and analyzed for the appropriate constituents indicated in Table G.1-2. A total of three wipe samples will be collected; one wipe sample from the floor, one wipe sample from the wall, and one wipe sample from the floor drain will be collected. Verification sampling will be conducted for the floor and then the wall to prevent cross contamination of the samples and allow for the identification of contaminated areas. Additional samples may be collected based on the records review and structural assessment described in Section 5.2.

#### 5.5.3 Decontamination and Verification of Decontamination for Room 9030

The entire demarcated portion of the floor and the wall (to a height of 8 feet) within the area of the room used for storage of hazardous waste within TA-3-29-9030 will be decontaminated using the wipe-down method described in Section 5.5. Verification wipe samples will be collected from a random location with each of the sample areas indicated on Figure G.1-3 in accordance with the procedure in Section 8.1 of this closure plan and analyzed for the constituents indicated in Table G.1-3. A total of two wipe samples will be collected; one wipe sample from the floor and one wipe sample from the wall will be collected. Verification sampling will be conducted for the floor and then the wall to prevent cross contamination of the samples and allow for the identification of contaminated areas. Additional samples may be collected based on the records review and structural assessment described in Section 5.2.

#### 5.6 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.1-5 and in accordance with LANL waste management procedures, depending on the regulated constituents present.

### 6.0 VERIFICATION CRITERIA

Successful decontamination to demonstrate clean closure of the TA-3-29 Permitted Unit will meet the performance standards outlined in Permit Part 9.1 including:

- No detectable RCRA-regulated constituent residues from the management of treated authorized RCRA-regulated wastes are identified in samples collected during closure activities.

- Analytical results of samples collected during decontamination verification activities identify no statistically significant concentrations of RCRA-regulated constituents above baseline/background data.
  - Baseline/background levels for wipe sample analytical results will be equivalent to the analytical results of an unused wipe media sample (blank).
- Detectable concentrations of RCRA-regulated constituents in samples collected during verification activities can be attributed to the construction material within the unit and not from part of waste management activities at the permitted unit.

#### 6.1 Alternative Demonstration of Closure

An alternative demonstration of closure may be justified at the TA-3-29 Permitted Unit if verification methods described in this closure plan are not feasible. LANL proposes the following alternative demonstrations:

- Detectable concentrations of RCRA-regulated constituents that cannot be removed or decontaminated to acceptable levels, as described above, will remain provided that these RCRA-regulated constituents do not pose an unacceptable risk when combined with technical or administrative control measures agreed upon with the Department.
  - Assessment (in conjunction with the Department) of residual contamination levels using an occupational risk scenario or the placement/continuance of controls at the unit after closure.
- All equipment/materials/surfaces of the permitted unit have been recycled or disposed of in accordance with applicable regulatory requirements.

#### 7.0 SAMPLING AND ANALYSIS PLAN

This sampling and analysis plan describes the sampling, analysis, and quality assurance/quality control (QA/QC) methods that will be used to demonstrate clean closure of the TA-3-29 Permitted Unit. It addresses specific requirements as contained in Permit Part 9.3.6.1.

##### 7.1 Sampling Activities

Samples will be collected from discrete locations according to the methods and procedures provided in this section and analyzed for the appropriate hazardous constituents included within Appendix VIII to 40 CFR Part 261 and Appendix IX to 40 CFR Part 264. The constituents within Appendices VIII and IX

have been narrowed down based on the operational history of EPA Hazardous Waste Numbers stored at the TA-3-29 Permitted Unit and included within Tables G.1-1, G.1-2, and G.1-3. Samples will be analyzed by an independent laboratory for those constituents using the methods outlined in Table G.1-6. Tables G.1-1, G.1-2, and G.1-3 will be modified, as necessary, at the time of notification of closure to incorporate changes based on the operating record review conducted at the TA-3-29 Permitted Unit.

## 8.0 SAMPLE COLLECTION PROCEDURES

Samples will be collected in accordance with the most recent and appropriate LANL sampling plan incorporating guidance from the EPA (EPA, 2002) and DOE (DOE, 1995), or other approved procedures.

### 8.1 Wipe Sampling

Surface wipe samples will be used to determine if residual hazardous constituents remain on the equipment and surfaces at the TA-3-29 Permitted Unit, the samples will be taken in accordance with the National Institute of Occupational Safety and Health (NIOSH) *Manual of Analytical Methods*, Method 9100 (NIOSH, 1994), or other approved methodology. The appropriate use of wipe sample method will consider the type of surface being sampled, the type of contaminant, the solution used, and the desired contaminant concentration detection limits. 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.

### 8.2 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 or wiped dry to prevent cross-contamination of samples. A disposable sampler is considered clean if still in a factory-sealed wrapper. Residue, disposable decontamination equipment, and reusable decontamination equipment that cannot be decontaminated will be containerized and managed appropriately at an approved on-site facility.

## 9.0 SAMPLE MANAGEMENT PROCEDURES

The following information presents general sample management and sampling equipment cleaning procedures for closure of the TA-3-29 Permitted Unit described in this closure plan. Samples will be collected and transported using documented chain-of-custody and sample management procedures to ensure the integrity of the sample and provide an accurate and defensible written record of the possession and handling of a sample from the time of collection through laboratory analysis. Sample collection equipment will include labels, chain-of-custody forms, EPA-certified clean containers, coolers, preservatives, and custody seals. The following provides a description of sample documentation; sample handling, preservation, and storage; and sample packaging and transportation requirements that will be followed during the sampling activities associated with the closure.

### 9.1 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).

#### 9.1.1 Chain-of-Custody

Chain-of-custody forms will be maintained by sampling personnel until the samples are relinquished to the analytical laboratory. 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:

- In a person's physical possession,
- In view of the person in possession, or
- 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/chain-of-custody form. A chain-of-custody form must accompany all samples from collection through laboratory analysis. The completed original chain-of-custody form will be returned by the analytical laboratory and will become a part of the permanent record documenting the sampling effort.

### 9.1.2 Sample Labels and Custody Seals

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

- A unique sample identification number;
- Name of the sample collector;
- Date and time of collection;
- Type of preservatives used, if any; and
- 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.

### 9.1.3 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 and the change initialed and dated by the author. The sample logbook will include the following information:

- The sample location.
- Suspected composition.
- Sample identification number.
- Volume/mass of sample taken.
- Purpose of sampling.
- Description of sample point and sampling methodology.
- Date and time of collection.
- Name of the sample collector.
- Sample destination and how it will be transported.
- Observations, and
- Names of personnel responsible for the observations.

## 9.2 Sample Handling, Preservation, and Storage

Samples will be collected and containerized in appropriate pre-cleaned sample containers. Table G.1-7 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.

## 9.3 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 LANL documents establish these 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 LANL packaging & 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.

## 10.0 ANALYSIS REQUIREMENTS

The following information presents general analysis procedures for closure of the TA-3-29 Permitted Unit. All general analytical laboratory requirements, quality assurance/quality control, and data requirements procedures for closure of the permitted unit are described within this section.

Analytical methods to be used for verification of clean up during the TA-3-29 Permitted Unit closure activities are summarized in Table G.1-6. Each sample will be analyzed for the constituents identified in Tables G.1-1, G.1-2, and G.1-3. Analytes, test methods/instrumentation, target detection limits, and rationale for metals and organic analyses are also presented in Table G.1-6.

### 10.1 Analytical Laboratory Requirements

The analytical laboratory will perform the detailed qualitative and quantitative chemical analyses specified in Section 10.2. This analytical laboratory will have:

- A documented comprehensive QA/QC program,
- Technical analytical expertise,

- A document control/records management plan, and
- The capability to perform data reduction, validation, and reporting.

The selection of the analytical testing methods identified in Table G.1-6 was based on the following considerations:

- The physical form of the waste,
- Constituents of interest,
- Required detection limits (e.g., regulatory thresholds), and
- Information requirements (e.g., waste classification).

## 10.2 Quality Assurance/Quality Control

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/analysis process, and are described in the following sections, along with information on calculations necessary to evaluate the QC results. QA/QC samples will be collected in accordance with the most recent and appropriate LANL sampling plan incorporating guidance from the EPA (EPA, 2002) and DOE (DOE, 1995), or other approved procedures. Analysis will be conducted in accordance with procedures given in SW-846 (EPA, 1986), or other approved procedures or methods.

### 10.2.1 Field Quality Control

The field QC samples that may be collected include trip blanks, field blanks, field duplicates, and equipment rinsate blanks. Table G.1-8 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.

### 10.2.2 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, statistically valid, and that can be documented. QC procedures are the tools employed to measure the degree to which these QA objectives are met.



### 10.3 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.

### 10.4 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 summary of analytical results for each sample;
- Results from QC samples such as blanks, spikes, and calibrations;
- Reference to standard methods or a detailed description of analytical procedures; and
- Raw data printouts for comparison with summaries.

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

## 11.0 WASTE MANAGEMENT

Decontamination and sample collection activities will be conducted with waste minimization goals in mind. All waste generated will be controlled, handled, characterized, and disposed of in accordance with LANL waste management procedures. Closure activities may generate different types of waste materials, which are listed with potential disposal options in Table G.1-5 of the closure plan.

After any washing or steam cleaning process needed for the closing unit, the excess wash water will be collected, transferred to containers, sampled, and analyzed for the hazardous constituents listed in Tables G.1-1, G.1-2, or G.1-3. The results of this analysis will determine if the excess wash water should be managed as hazardous or non-hazardous wastewater. The wastewater, PPE, and any other waste generated as a result of closure including discarded equipment will be managed as outlined in Table G.1-5. All decontamination activities involving wash water will be conducted using portable secondary containment devices in order to prevent migration to other areas of the TA-3-29 basement. In addition, all waste management operations will be subject to conditions in Attachment D (*Contingency Plan*) of this Permit to further prevent potential contamination if spills occur. Subsequent disposition options for the decontaminated structures and equipment include reuse, recycling, or disposal.

## 12.0 CLOSURE CERTIFICATION REPORT

Upon completion of the closure activities at the TA-3-29 Permitted Unit, a closure certification report will be prepared and submitted to the Department. The report will document the closure and contain the following:

- A copy of the certification described in Section 4.2 of this closure plan.
- Any significant variance from the approved activities and the reason for the variance.
- A summary of all sampling results, showing:
  - Sample identification
  - Sampling location
  - Datum reported
  - Detection limit for each datum
  - A measure of analytical precision (e.g., uncertainty, range, variance)
  - Identification of analytical procedure
  - Identification of analytical laboratory.
- A QA/QC statement on analytical data validation and decontamination verification.
- The location of the file of supporting documentation, including:
  - Field logbooks
  - Laboratory sample analysis reports
  - QA/QC documentation
  - Chain-of-custody forms.
- Storage or disposal location of regulated hazardous/mixed waste resulting from closure activities.
- A certification of accuracy of the report.

## 13.0 NEW MEXICO ENVIRONMENT DEPARTMENT CLOSURE ASSESSMENT

LANL will notify the Department prior to the pre-closure and structural assessment of the waste management unit, described in Section 5.2, to provide an opportunity to participate in the unit's physical condition review. LANL may also arrange for other on-site reviews of closure activities at reasonable times upon request by Department representatives. Upon submittal of the closure certification report described in Section 12.0 of this closure plan, LANL will arrange an on-site closure review with representatives of the Department to assess the completion of the closure activities for each waste

management unit. LANL may also arrange for other on-site reviews of prior closure activities during the closure period at reasonable times upon request by Department representatives.

#### 14.0 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.

LANL, 2003a. "Los Alamos National Laboratory General Part B Permit Renewal Application, Revision 2,0" LA-UR-03-5923, Los Alamos National Laboratory, Los Alamos, New Mexico.

NIOSH, 1994. The National Institute for Occupational Health and Safety (NIOSH) *Manual of Analytical Methods*, Method 9100, 4th ed. Issue 1. 1994.

**Table G.1-1****Hazardous Waste Constituents of Concern at the Technical Area 3, Building 29 Permitted Unit, Room 9010<sup>a</sup>**

Category	EPA Hazardous Waste Numbers	Specific Constituents
Toxic Metals	D004, D005, D006, D007, D008, D009, D010, D011	Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver
Volatile Organic Compounds	F001, F002, F003, F005, F006	Trichloroethylene, Nitrobenzene, Methyl ethyl ketone, Nitrobenzene
Semi-Volatile Organic Compounds	D018, D022, D027, D029, D030, D032, D033, D034, D035, D036, D037, D038, D040, D041, D042	Benzene, Chloroform, 1,4-Dichlorobenzene, 1,1-Dichloroethylene, 2,4-Dinitrotoluene, Hexachlorobenzene, Hexachlorobutadiene, Hexachloroethane, Methyl ethyl ketone, Nitrobenzene, Pentachlorophenol, Pyridine, Trichloroethylene, 2,4,5-Trichlorophenol, 2,4,6-Trichlorophenol

<sup>a</sup>Based on the unit operating record.  
EPA = U.S. Environmental Protection Agency

**Table G.1-2****Hazardous Waste Constituents of Concern at the Technical Area 3, Building 29 Permitted Unit, Room 9020<sup>a</sup>**

Category	EPA Hazardous Waste Numbers	Specific Constituents
Toxic Metals	D004, D005, D006, D007, D008, D009, D010, D011	Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver
Volatile Organic Compounds	F001, F002, F003, F005, F006	Trichloroethylene, Nitrobenzene, Methyl ethyl ketone, Nitrobenzene
Semi-Volatile Organic Compounds	D018, D022, D027, D029, D030, D032, D033, D034, D035, D036, D037, D038, D040, D041, D042	Benzene, Chloroform, 1,4-Dichlorobenzene, 1,1-Dichloroethylene, 2,4-Dinitrotoluene, Hexachlorobenzene, Hexachlorobutadiene, Hexachloroethane, Methyl ethyl ketone, Nitrobenzene, Pentachlorophenol, Pyridine, Trichloroethylene, 2,4,5-Trichlorophenol, 2,4,6-Trichlorophenol

<sup>a</sup>Based on the unit operating record.  
EPA = U.S. Environmental Protection Agency

**Table G.1-3**

**Hazardous Waste Constituents of Concern at the Technical Area 3, Building 29 Permitted Unit, Room 9030<sup>a</sup>**

<b>Category</b>	<b>EPA Hazardous Waste Numbers</b>	<b>Specific Constituents</b>
Toxic Metals	D008	Lead

<sup>a</sup> Based on the unit operating record.

EPA = U.S. Environmental Protection Agency

**Table G.1-4**

**Closure Schedule for the Treatment Units at Technical Area 3, Building 29**

<b>Activity</b>	<b>Maximum Time Required <sup>a</sup></b>
Notify the Department of intent to close.	-45 Days
Conduct records review and structural assessment.	-25 Days
Final receipt/treatment of waste.	Day 0
Begin closure activities.	Day 5
Decontaminate surfaces and equipment.	Day 20
Sample excess decontamination materials for disposal.	Day 20
Perform verification sampling.	Day 30
Evaluate analytical data from verification sampling.	Day 50
Perform additional decontamination, if necessary.	Day 55
Perform additional verification sampling, if necessary.	Day 60
Evaluate additional analytical data.	Day 75
Perform final cleanup and disposal (i.e., removal of decontaminated equipment and decontamination waste).	Day 140
Prepare closure certification report.	Day 150
Certify closure.	Day 175
Submit final report to the Department.	Day 180

<sup>a</sup> The schedule above indicates calendar days from the beginning by which activities will be completed. Some activities may be conducted simultaneously and/or may not require the maximum time listed. Extensions to this schedule may be requested, as needed.

**Table G.1-5**

**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	Technical Area 54 (TA-54) Area G or 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	TA-54 Area G or 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	TA-54 Area G or 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, recycled, or reused

**Table G.1-5**

**Potential Waste Materials, Waste Types, and Disposal Options**

Potential Waste Materials	Waste Types	Disposal Options
	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	TA-54 Area G or 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	TA-54 Area G or 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.1-6  
Summary of Proposed Analytical Methods**

Analyte	EPA SW-846 Analytical Method <sup>a</sup>	Test Methods/ Instrumentation	Target Detection Limit <sup>b</sup>	Rationale
<i>Metal Analysis</i>				
Arsenic	7060A <sup>c</sup> , 7061A	FLAA, GFAA	10 ug/L	Determine the metal concentration in the samples.
Barium	7080A <sup>d</sup> , 7081 <sup>c</sup>	FLAA,GFAA	200 ug/L	
Cadmium	7130 <sup>d</sup> , 7131A <sup>c</sup>	FLAA, GFAA	2 ug/L	
Chromium	7190 <sup>d</sup> , 7191 <sup>c</sup>	FLAA, GFAA	10 ug/L	
Lead	7420 <sup>d</sup> , 7421 <sup>c</sup>	FLAA, GFAA	5 ug/L	
Mercury	7470A, 7471A <sup>e</sup>	CVAA	0.2 ug/L	
Selenium	7740 <sup>c</sup> , 7741A	FLAA, GFAA	5 ug/L	
Silver	7760A <sup>d</sup> , 7761 <sup>c</sup>	FLAA, GFAA	10 ug/L	
<i>Organic Analysis</i>				
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 <sup>c</sup>	GC/MS	10 mg/L	Determine the SVOCs concentration in the samples.

<sup>a</sup> U.S. Environmental Protection Agency (EPA), 1986 and all approved updates, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846.

<sup>b</sup> 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.

<sup>c</sup> Method being integrated into Method 7010, per the May 1998 SW-846 Draft Update IVA.

<sup>d</sup> Method being integrated into Method 7000B, per the May 1998 SW-846 Draft Update IVA.

<sup>e</sup> 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

SVOC = semi volatile organic compounds

ug/L = micrograms per liter.

VOC = volatile organic compounds



**Table G.1-7**

**Recommended Sample Containers<sup>a</sup>, Preservation Techniques, and Holding Times<sup>b</sup>**

Analyte Class and Sample Type	Container Type and Materials	Preservation	Holding Time
<i>Metals</i>			
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 <sub>3</sub> 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 <sub>3</sub> to pH <2 Cool to 4 °C	28 Days
	Solid Media: 125-mL Glass	Solid Media: Cool to 4 °C	
<i>Volatile Organic Compounds</i>			
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	
<i>Semi-Volatile Organic Compounds</i>			
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	

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

<sup>b</sup> 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<sub>3</sub> = nitric acid

L = Liter

TCLP = Toxicity Characteristic Leaching Procedure

**Table G.1-8**

**Recommended Quality Control Sample Types, Applicable Analyses, Frequency, and Acceptance Criteria**

<b>QC Sample Type</b>	<b>Applicable Analysis<sup>a</sup></b>	<b>Frequency</b>	<b>Acceptance Criteria</b>
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 <sup>b</sup>	VOC/SVOC, metals	One sample daily	Not Applicable

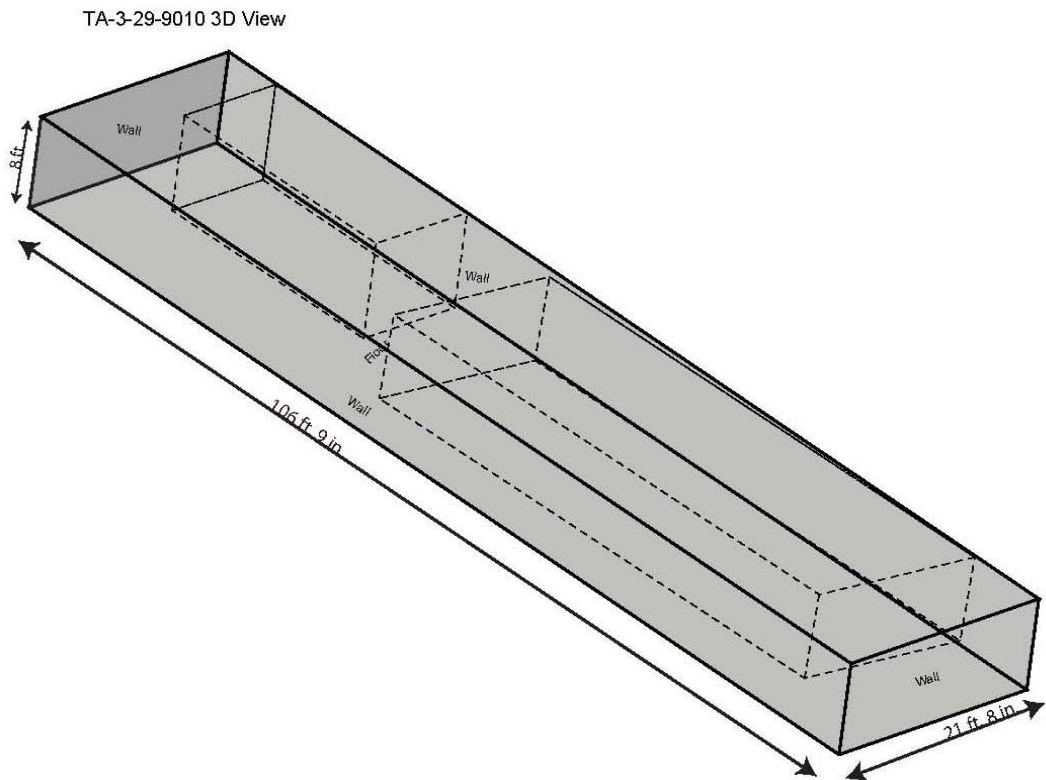
<sup>a</sup> For VOC and SVOC analysis, if blank shows detectable levels of any common laboratory contaminant (e.g., methylene chloride, acetone, 2-butanone, toluene, and/or any phthalate ester), sample must exhibit that contaminant at a level 10 times the quantitation limit to be considered detectable.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




<sup>b</sup> Collected only if reusable sampling equipment used.

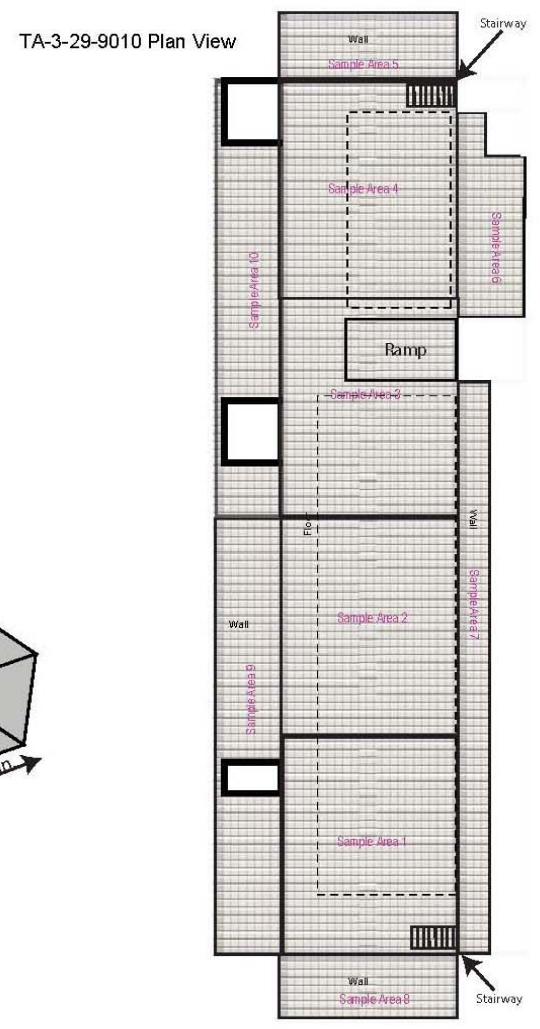
QC = quality control

VOC = volatile organic compound

SVOC = semi-volatile organic compound



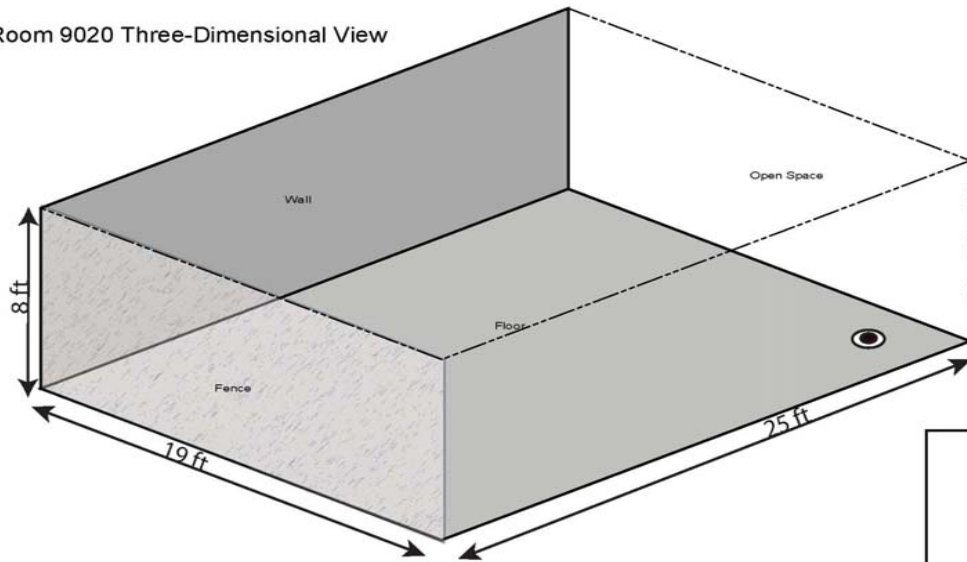
-  Storage Area Surface
-  Clean Up Verification Sample Area
-  Outline of enclosure



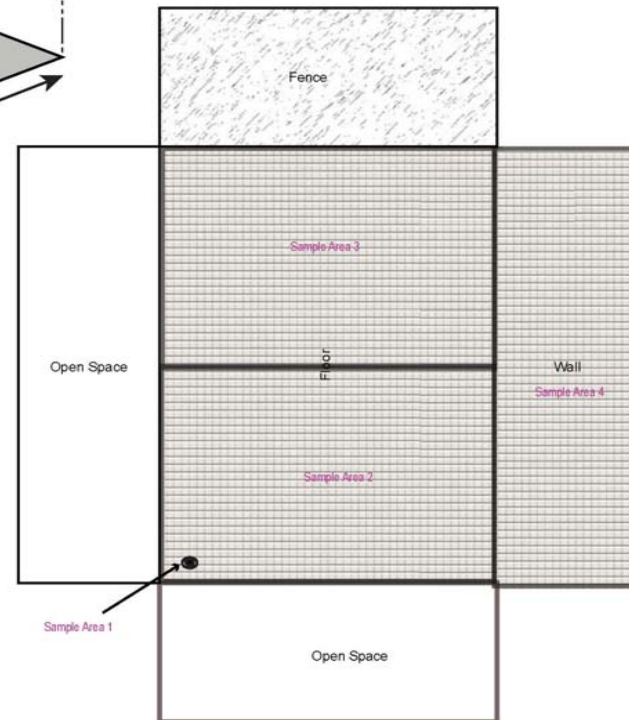
Not to scale

**Figure G.1-1**  
**Technical Area 3, Building 29, Room 9010**  
 51

Room 9020 Three-Dimensional View



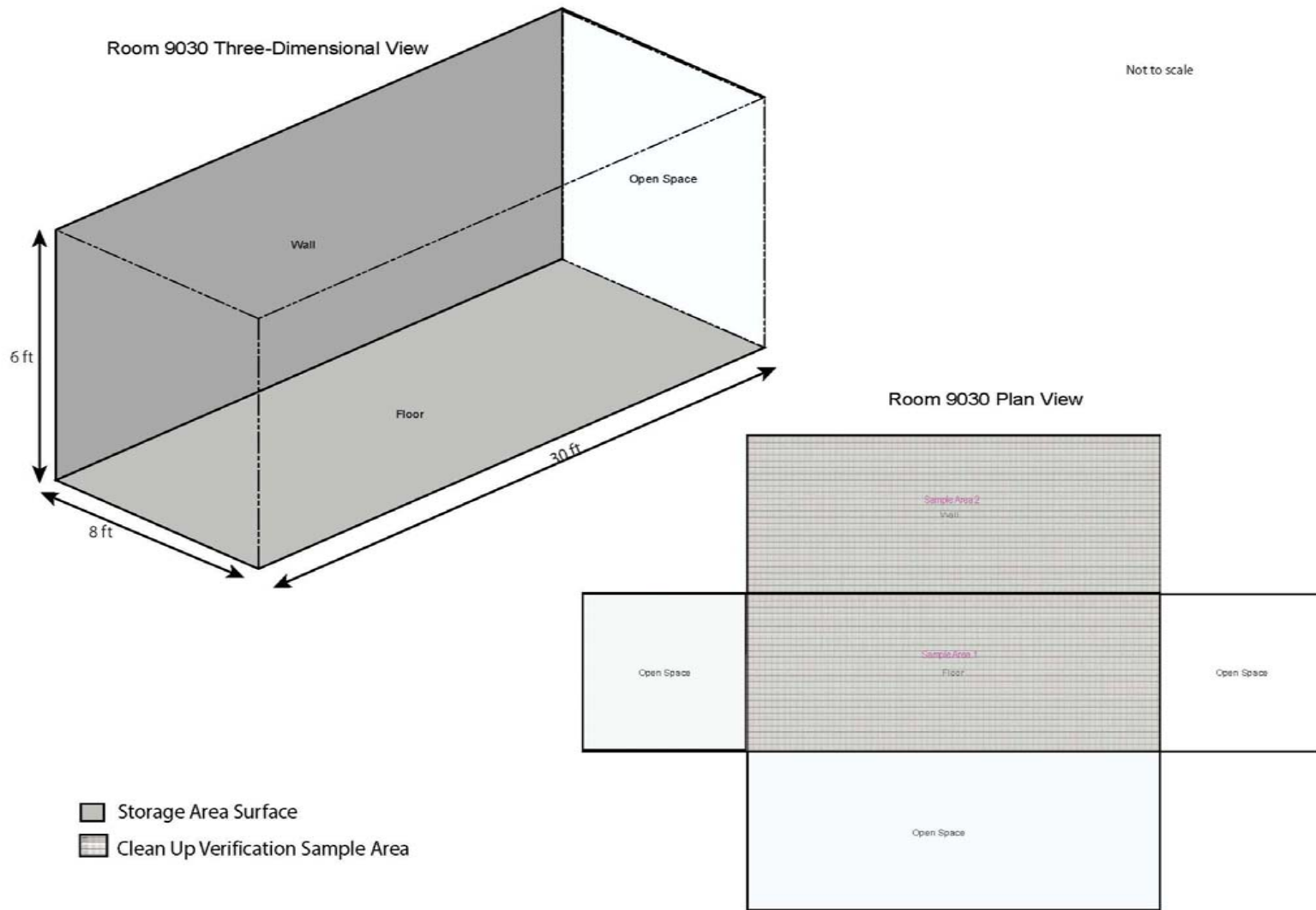
Room 9020 Plan View



-  Storage Area Surface
-  Clean Up Verification Sample Area
-  Chainlink fence
-  Drain

Not to scale

**Figure G.1-2**  
**Technical Area 3, Building 29, Portion of Room 9020**



**Figure G.1-3**  
**Technical Area 3, Building 29, Portion of Room 9030**

**Figure G.1-4**  
**Closure Progression for the Technical Area 3, Building 29, Permitted Unit**

