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MDA-B SAMPLING AND ANALYSIS PLAN

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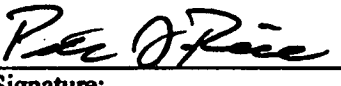
Pete Rice		06/15/2010
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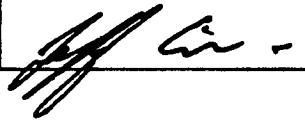
Jeff Erickson		06/15/2010

This document fully satisfies the requirements of P300, Integrated Work Management, in order to systematically describe the work activity, the associated hazards, and the controls that MUST be employed to mitigate the risks.

REVISION HISTORY

Document No./Revision No.	Issue Date	Action	Description
TA21-MDAB-PLAN-00017/ Rev 0	06/15/2010	New Plan	This plan describes the methods, **procedures, frequencies, and rational for** samples collected to support the investigation/remediation and waste management efforts at MDA-B.

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ACRONYMS

AK	acceptable knowledge
AL	action level
DIF	Definitive Identification Facility
DOE	U.S. Department of Energy
DQA	data quality assessment
DQO	data quality objective
DR	decision rule
DS	decision statement
EPA	U.S. Environmental Protection Agency
ESH&Q	environmental, safety, health, and quality
HAZCAT	hazard categorization
IDW	investigation derived waste
IWRP	Investigation/Remediation Work Plan
IWD	integrated work document
LANL	Los Alamos National Laboratory
LLW	low-level waste
MAR	material at risk
MDA B	Material Disposal Area B
NMSW	New Mexico special waste
NTS	Nevada Test Site
PCB	polychlorinated biphenyl
PPE	personal protective equipment
PSQ	principal study question
QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
RCT	radiological control technician
RPP	Radiation Protection Program
SAP	sampling and analysis plan

SOP	standard operating procedure
SOW	statement of work
SSHASP	Site-Specific Health and Safety Plan
SVOC	semivolatile organic compound
SWMU	solid waste management unit
TA	Technical Area
TAL	target analyte list
TCLP	toxicity characteristic leaching procedure
TPH	total petroleum hydrocarbon
TRU	transuranic
TSDF	treatment, storage, and disposal facility
VOC	volatile organic compound
WAC	waste acceptance criteria
WIPP	Waste Isolation Pilot Plant

2. INTRODUCTION

Material Disposal Area (MDA) B is an inactive subsurface disposal site located at Technical Area 21 (TA-21) on the Delta Prime (DP) Mesa between Los Alamos Canyon and DP Canyon. The site occupies approximately 6 acres and was the first common disposal site for contaminated (chemical and radiological) materials at the Los Alamos National Laboratory (LANL). The MDA-B disposal site is undergoing investigation/remediation under LA-UR-06-6918, EP2006-0783, *Investigation/Remediation Work Plan for Material Disposal Area B, Solid Waste Management Unit 21-015, at Technical Area 21* (IWRP), which was approved by NMED on 1-31-07. This work plan was written pursuant to the March 1, 2005 Compliance Order on Consent (Consent Order). This investigation/remediation effort includes the removal of all buried waste and confirmation that any residual concentrations of contaminants in the surrounding soil and tuff are below their respective residential cleanup levels.

3. PURPOSE

The purpose of this Sampling and Analysis Plan (SAP) is to describe the methods, procedures, frequencies, and rational for samples collected to support the investigation/remediation and waste management efforts at MDA-B. The main text of the SAP provides the general requirements for all sampling activities at MDA-B. The SAP Attachments A – H provide the detailed material/media (i.e., overburden, contaminated soil, porous debris) specific sampling requirements. This SAP combined with the associated Waste Characterization Strategy Forms (WCSFs), and the TA21-MDAB-PLAN-00014, *MDA-B Waste Management Plan (WMP)* are intended to meet the Characterization Plan requirement specified in the MDAB-ABD-1005, *Facility Safety Plan (FSP).*

4. SCOPE

This SAP has been specifically prepared to support the principal objectives of the IWRP:

- Direct excavation of the MDA-B disposal trenches.
- Characterize the types of waste contained in the trenches to facilitate the removal and containerization of waste items/materials from the disposal trenches.
- Collect confirmation samples to characterize the radiological, organic chemical and inorganic chemical concentrations in the soil and rock adjacent to the disposal trench sides and bottoms and in the deeper subsurface beneath the site.

Collect data to support the evaluation of the potential risk to human health and the environment associated with any residual contamination remaining at MDA-B after the waste is removed.

A detailed description of this scope is provided and amended by the following documents:

- LA-UR-06-6918, *EP2006-0783, Investigation/Remediation Work Plan for Material Disposal Area B, Solid Waste Management Unit 21-015, at Technical Area 21, Revision1*
- NMED 1/31/07, *Approval with Modifications for the Investigation/Remediation Work*

Plan for Material Disposal Area B, Solid Waste Management Unit 21-015, at Technical Area 21, Revision1, Los Alamos National Laboratory

- ENV-RCRA: 07-223, *Request for Approval of an Area of Contamination for the Investigation of Solid Waste Management Unit 21-015, Material Disposal Area B, at Technical Area 21, Los Alamos National Laboratory.*
- NMED 10/2/07, *Approval of An Area of Contamination for the Investigation and Remediation of SWMU 21-015, Material Disposal Area B, at Technical Area 21, Los Alamos National Laboratory*

5. BACKGROUND

The MDA-B disposal site is designated as solid waste management unit (SWMU) 21-015. It served as a contaminated waste disposal facility for a variety of Manhattan Project operations that occurred from 1944 to 1948. The site is located parallel to DP road and south of the businesses located in that area as shown on Figure 1. There are 8 disposal trenches at MDA-B, of which, the majority are 300-ft long, 50-ft wide, and 15-ft deep. Like many disposal sites of this time period, material disposal documentation for waste tracking, segregation, and waste placement was not rigorous (LA-UR-07-2379).

From 1944 until 1948, the Laboratory's primary waste producing operations at TA-21 were located at DP East and DP West. The LANL research and development mission during that time period focused on the purification, machining, and recovery of plutonium, uranium, and their daughter products. By the fall of 1944, the Laboratory's Chemistry Division had developed several separation techniques to recover plutonium from residues. Solids from incinerator reduction operations were dissolved in nitric and hydrofluorous acid to recover trace amounts of plutonium (Merrill 1990, 11721). During the Early 1940's, plutonium recovery was conducted until the maximum concentration of plutonium in the solution was 10 - 4 g/L. Once this concentration was reached, the solution was discarded. These processes are described to provide an overview of the materials that were potentially disposed of at MDA-B.

The chemicals disposed of at MDA-B included old bottles of organic compounds (i.e., perchlorate, ethers, and solvents). A 1987 DOE document also stated that lecture bottles, mixtures of spent chemicals, old chemicals, and corrosive gases may be in the trenches at the east end of MDA B (DOE 1986, 08657). Other materials identified in the process history include:

- Concentrated acids (i.e., nitric, hydrochloric, hydrofluoric, sulfuric, and trichloroacetic acid).
- Organic solvents (i.e., trichloroethene (TCE) and benzene).
- Compressed gas cylinders containing an array of inert and reactive materials (i.e., helium, nitrogen, and nickel carbonyl).

- Oxidizers, reactives, and/or other toxic chemicals (i.e., caustic soda, potassium hydroxide, hydrogen peroxide, perchloric acid, metal fluorides, nitro-aromatics/nitro-amines, cyanide, ethylene glycol, asbestos as powder, and asbestos-containing building materials).
- Cutting oils and other lubricants used in machining processes.
- Select process-related metals (i.e., beryllium, lead, and magnesium).

The principal radioactive contaminants consist of the types of radioactive materials used at the time: plutonium, polonium, uranium, americium, curium, radioactive lanthanum, and actinium. Additionally, there could be waste products possibly contaminated with either uranium-235 or cesium-137 from the water boiler reactor (Meyer 1952, 28154). The majority of the radioactively contaminated waste consisted of paper, rags, rubber gloves, glassware, and small metal apparatuses placed in cardboard boxes by the waste originator and sealed with masking tape. The remainder of the material consisted of metal, such as air ducts and large metal apparatuses. The latter type of material was placed in wooden boxes or wrapped with paper (Meyer 1952, 28154). At least one truck contaminated with fission products from the Trinity test is believed to be buried in MDA B (DOE 1986, 08657).The complete operational history relevant to MDA B during the 1944 to 1948 time frame that MDA B was open is presented in LA-UR-06-3693, *MDA-B Historical Context.*

Lists of chemicals typically kept on hand at LANL research facilities from 1944–1948 are provided in Section 9.0 of LA-UR-07-2379, *Material Disposal Area B: Process Waste History*. It also provides details on historical processes and process-related chemicals employed during the Manhattan Project that may be found in the MDA B subsurface.

6. ROLES AND RESPONSIBILITIES

6.1 Sample Coordinator

- Reviews and approves this plan to ensure that it meets LANL waste characterization and certification requirements.
- Ensures that the sampling personnel are trained to perform sampling activities in accordance with this SAP.
- Ensures that sampling personnel follow the procedures identified in this SAP.
- Ensures that sampling personnel follow DOT regulations when transporting samples to analytical facilities.
- Ensures that QA records generated by sampling operations are maintained as described in this SAP.
- Coordinates sample analysis with analytical laboratory personnel.
- Maintains an adequate inventory of sample preservatives and ensures that they are properly stored and have not exceeded the labeled shelf-life.

6.2 Sample Technician

- Read, understand, and correctly execute the sampling procedures identified in this SAP.
- Provide accurate and legible QA records to the Sampling Coordinator.
- Resolve all safety concerns with the IHS-OS and/or an RP-1 RCT or Team Leader before initiating sampling activities.
- Report all spills that occur during sampling operations to the TA-21 Operations Center, WMC, and/or ENV-RCRA Representative and document the spill by preparing a spill report.
- Collect representative samples.
- Collect and prepare samples to comply with the analytical laboratory's requirements.
- Collect the appropriate number of duplicate and QC samples, if appropriate, for each sampling event.
- Preserve the samples according to EPA-SW-846 guidance to ensure that the samples retain the properties of the original waste except in circumstances where preservation might cause safety problems.
- Properly label samples and complete chain-of-custody forms to ensure that the sample can be tracked through the entire sampling process.
- Complete field logbooks.
- Promptly submit samples to the analytical laboratory to avoid exceeding sample holding times.

6.3 Quality Assurance/Quality Control Officer

- Reviews this plan and any revisions for QA and QC issues.
- Periodically assesses the sampling operations to ensure that QA and QC principles and practices established by this plan are implemented.
- Assists the Sampling Coordinator in determining the cause of nonconformance, initiating corrective actions, and verifying that corrective actions have been completed.
- Ensures that records are maintained as described in Section 18.0 of this plan.

6.4 Industrial Hygienist

- Determines the level of PPE that sampling personnel must wear.
- Performs periodic safety assessments of sampling operations.
- Provides personnel safety guidance to sampling personnel.
- Monitor work conditions for unsafe levels of chemicals or other changed site conditions.
- Perform personnel monitoring throughout field sampling activities.

6.5 Radiation Control Technician (RCT)

- Provide onsite monitoring for all field activities to ensure the work environment is safe for sampling personnel.
- Monitor conditions in the field to ensure that changing conditions do not warrant additional PPE or evacuation of the site because of an unsafe work environment.
- Coordinatedaily, at a minimum, with the ES&H coordinator to ensure all field sampling activities are being performed in accordance with project and program requirements.
- Provide field radiological screening during sample collection, providing basic field screening information to laboratory personnel as an initial screening tool on radioactivity levels prior to sample inspections.
- Screen sample coolers daily or when they reach capacity to support sample transport and preparation for shipment to the analytical laboratory.
- Provide signed copies of survey data for DOT shipping purposes.

6.6 Waste Management Technician

- Open and close waste containers during sampling operations.
- Label waste containers.
- Provide assistance to sampling personnel.

6.7 Waste Management Coordinator (WMC)

- Submit sample event numbers to the data steward to ensure that an automatic waste determination is initiated.
- Advise Video Camera Operator regarding waste identification and segregation.

6.8 ENV-RCRA Representative/Environmental Generalist

- Review and Approve Waste Characterization Strategy Forms.
- Review automatic waste determinations to ensure accuracy and determine appropriate EPA waste codes.
- Advise Video Camera Operator regarding waste identification and segregation.

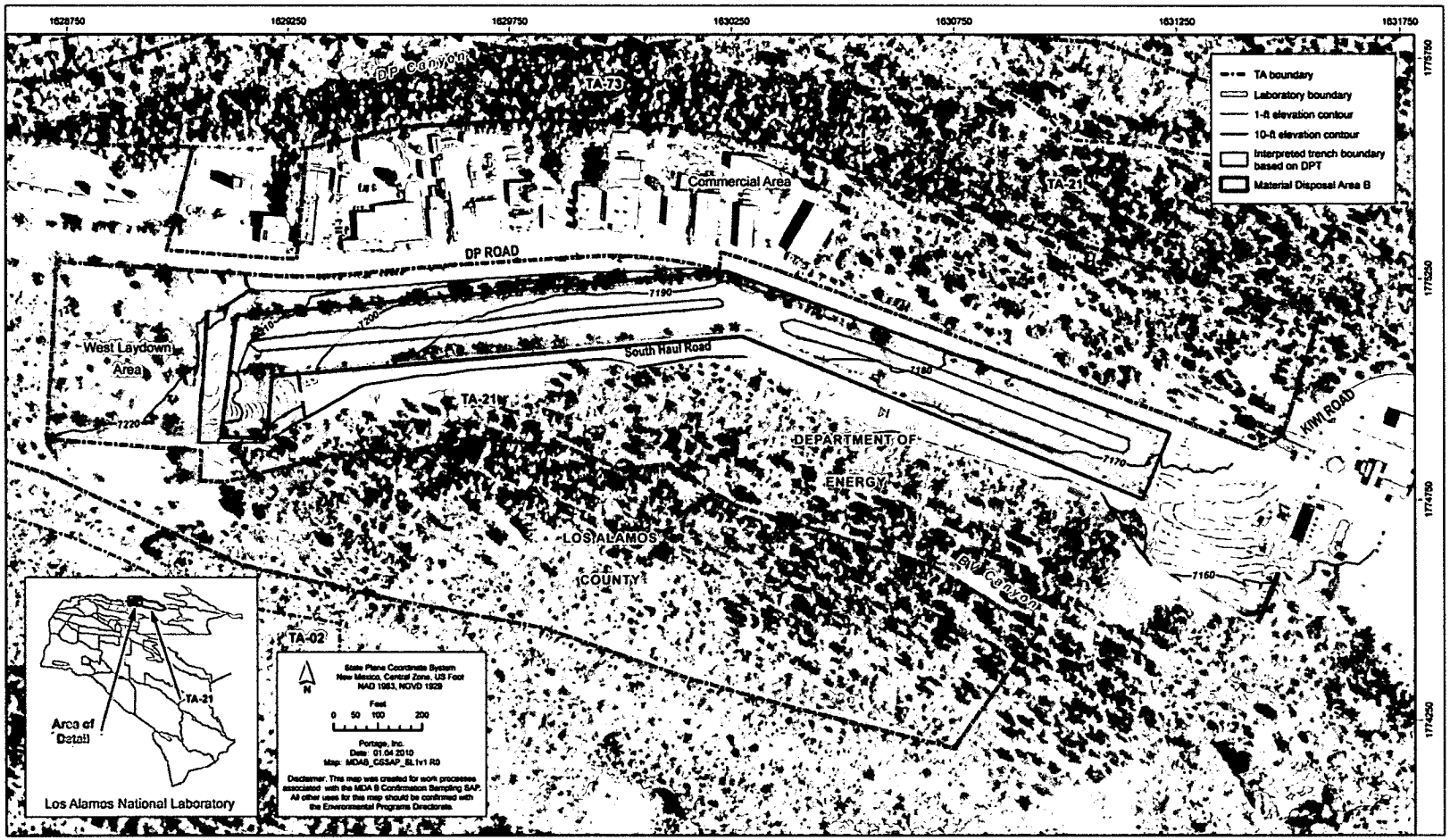

Figure 1: MDA-B Site Location Map

7. DATA QUALITY OBJECTIVES

The Data Quality Objectives (DQO) process prescribed by EPA QA/G-4, *Guidance for the Data Quality Objectives Process* will be employed for samples to confirm or refute a waste stream being assigned to a specific waste type (i.e., LLW, MLLW, Hazardous). The DQOs will be used as a tool to provide in-depth evaluation of analytical needs, uncertainties, requirements, expectations, and quality. The following sections provide a set of generic DQOs that will apply to most of the materials/media (i.e., the waste) sampled at MDA-B. If media specific DQOs are necessary they are provided in Attachments A – H along with the other media specific sampling requirements.

7.1 Problem Definition

The radioactive inventory and chemical and radiochemical composition of the waste materials/media excavated from MDA B are predominantly unknown due to limited waste management and disposal documentation from that time period. Historical records suggest waste and/or contamination are distributed heterogeneously; and while available disposal patterns have been used to estimate the radioactive inventory and to identify potential chemical contaminants at the site, the lack of subsurface data results in significant uncertainty concerning the concentration and distribution of potential contaminants. These materials/media must be characterized to meet the Waste Acceptance Criteria of various off-site disposal facilities and U.S. Department of Transportation requirements.

7.2 Decision Statement

The following Principal Study Question (PSQ), Alternative Actions (AA), and decision statement (DS) are applicable:

PSQ: What is the chemical and/or radiological contaminant composition of waste materials/media excavated from MDA-B?

AA1: Material/media that is NOT RCRA-regulated and meets the definition of Class A radioactive waste will be will be disposed of as LLW. This also includes LLW contaminated with polychlorinated biphenyls (PCBs).

AA2: Material/media that is RCRA-regulated and meets the definition of Class A radioactive waste will be treated and/or disposed of as MLLW.

AA3: RCRA regulated and non-RCRA regulated material/media that exceeds a total alpha activity concentration of 100 nanocuries per gram (nCi/g) (transuranic [TRU] waste) will be disposed of as MTRU or TRU, respectively.

AA4: RCRA regulated and non-RCRA regulated material/media that exceeds the Class A criteria but is not TRU will be treated and disposed of as MLLW or LLW, respectively.

AA5: Material/media that is non-radioactive RCRA regulated waste will be treated and/or disposed of as Hazardous Waste.

AA6: Material/media that meets the definition of a solid waste, is nonhazardous, and nonradioactive but still requires unique handling, transportation, or disposal, will be disposed of as New Mexico special waste (NMSW).

AA7: Material/media that is NOT Hazardous Waste, LLW, TRU, MLLW, or NMSW, will be disposed of as Industrial Waste.

DS: The waste material/media will be disposed of as Industrial Waste, LLW, Hazardous Waste, MLLW, or TRU Waste at an appropriate off-site facility.

7.3 Decision Inputs

The following decision inputs are applicable:

DI1: Acceptable Knowledge, in the form of visual examination during excavation used to identify the material/media as a specific item with a known composition (e.g., batteries, PCB Ballast, fluorescent light tube, mercury pump, mercury thermometer).

DI2: Characterization data for radionuclides (by alpha and gamma spectroscopy); isotopic plutonium, uranium, americium, and tritium.

DI3: Characterization data for PCB.

DI4: Characterization data for hazardous chemicals (e.g., total metals, beryllium, volatile organic compounds (VOC), and semi-volatile organic compounds (SVOC), perchlorate) (used to determine presence ONLY).

DI5: Analytical results from samples collected and analyzed for TAL metals; radionuclides (by alpha and gamma spectroscopy); isotopic plutonium, uranium, americium, and tritium; VOCs; and SVOCs. The analysis may also include PCB (e.g., transformers, ballasts) and/or asbestos as needed.

DI6: Analytical results from liquids, residues, sludges, and/or solids collected and analyzed in accordance with Attachment G and H of this SAP, respectively.

NOTE: The decision inputs provided above can be used in any combination to make a waste determination.

The action levels (AL) are:

AL1: Regulatory threshold concentrations as specified by RCRA in 40 CFR 261.24.

AL2: Characteristic properties (ignitability, corrosivity, and reactivity) as specified by RCRA in 40 CFR 261.21 – 23.

AL3: Land Disposal Restriction (LDR) treatment standards in 40 CFR 268.40.

AL4: Regulatory threshold concentrations for classification of radioactive waste 10 CFR 61.55.

AL5: P930-1, *LANL Waste Acceptance Criteria.*

AL6: The WAC for the Nevada Test Site (NTS).

AL7: The WAC for the treatment facilities at Bear Creek and Perma-Fix.

AL8: The WAC for Energy *Solutions* Bulk Waste Facility at Clive, Utah.

AL9: The WAC for Clean Harbors.

7.4 Study Boundaries

The next step is to define the spatial and temporal boundaries of the study. The spatial boundaries define the physical extent of the study area, while the temporal boundaries define the duration of the study or specific parts of the study. Once defined, the practical constraints that may affect the study are discussed.

6.4.1 Spatial

MDA B occupies approximately 6 acres and, based on recently completed geophysical surveys, consists of 10 trenches/disposal cells. The site dimensions are estimated as follows:

- Length: ~ 1,950 ft
- Width range: ~ 75 ft to 300 ft
- Waste depths range: ~ 3 ft to 15 ft
- Overburden/layback: ~ 0 – 3 ft

Additional detail with respect to environmental setting, location, and size of MDA B are provided in LA-UR-06-6918, *Investigation/Remediation Work Plan for Material Disposal Area B, Solid Waste Management Unit 21-015, at Technical Area 21, Los Alamos National Laboratory.*

6.4.2 Temporal

The current schedule for the start of MDA B waste excavation is the June 2010 with completion of December 2010. Waste disposal operations at the site are expected to complete the middle of 2011.

6.4.3 Practical Constraints

The following practical constraints are applicable:

- Material excavated from MDA-B will be raked, screened, and/or sifted, as necessary, to segregate larger waste items/materials from the bulk soil prior to being containerized.
- Materials with AK that can be visibly confirmed do not have to be sampled (e.g., lead gloves, glass/plastic labware that does not contain residuals).
- Equipment/non-porous waste may be characterized based upon the analytical results of any liquid, residue, sludge, and/or solid that it contains.
- Unknown conditions in the MDA B subsurface present difficulties in quantifying the necessary safety measures.
- The exact boundaries of the MDA B waste trenches are unknown. This includes the exact depth and extent of overburden/layback.

7.5 Decision Rules

Decision rules (DRs) are specified to define the parameter(s) that characterize the population of interest. The following summarizes the parameters of interest for the PSQ and defines the decision pathway once they are characterized.

DR1: IF the characterization results indicate the material is NOT RCRA regulated and is Class A LLW, THEN it will be disposed of at an approved federal or commercial Treatment, Storage, and Disposal Facility (TSDF).

DR2: IF the characterization results indicate the material is RCRA regulated and the total alpha activity is less than Class A activity, THEN the waste will be disposed of at an approved federal or commercial TSDF.

DR3: IF the characterization results for a given lot of debris indicates that it is RCRA or Non-RCRA regulated TRU waste (exceeding Class A activity), THEN the waste will be packaged in accordance with the LANL QAC and transferred to TA-54 for disposal at the Waste Isolation Pilot Plant (WIPP).

DR4: IF the characterization results indicate that the material is RCRA regulated, exceeds Class A limits (but the waste is not TRU), THEN the waste will be packaged and transported to an approved treatment facility prior to disposal at an approved federal or commercial TSDF.

DR5: IF the characterization results indicate that the material is nonradioactive RCRA regulated waste, THEN the waste will be treated and/or disposed of at an approved federal or commercial TSDF.

DR6: IF the characterization results indicate that the material is a solid waste that is NOT RCRA regulated and nonradioactive but still requires unique handling, transportation, or disposal (e.g., hydraulic fluid or motor oil), THEN the waste may be disposed of as NMSW.

DR7: IF the characterization results indicate that the material is not Hazardous waste, PCB waste, LLW, TRU waste, mixed waste, or NMSW; THEN the waste will be disposed of as Industrial Waste.

7.6 Decision Error Limits

Decision error limits are specified, whenever possible, to minimize data uncertainty. This is managed by specifying tolerable limits on decision errors that are used to establish performance goals for the sampling design. However, waste determination depends on many different characteristics of the waste, none of which are statistical in nature. Therefore, it is not appropriate to identify statistical hypotheses or error rates.

8. GENERAL INSTRUCTIONS FOR SAMPLING PERSONNEL

The general instructions in this section highlight information about equipment and supplies; sample collection, preservation, packaging, and shipping; decontamination procedures; and documentation. By following these instructions sampling personnel will ensure that the sample acquired is representative of the waste, thus providing scientifically valid and legally defensible analytical data. Sampling personnel will review these general guidelines and the media/material specific sampling guidelines provided in Attachments A – I prior to each sampling event.

8.1 Preparation

Preparation for sampling activities requires organizing the sample container(s), sample label(s), and documentation in an orderly, systematic manner that promotes consistency and traceability of all data. Sampling personnel will perform the following activities before each sampling event.

- Identify personnel to collect samples.
- Consult with the Sample Management Office (SMO) and this SAP regarding sample containers, labels, paperwork, analytical needs, preservatives, and hold times.
- Obtain and validate paperwork (i.e., COC, sample labels) from SMO.
- Consult with MDA-B Operations, Industrial Hygiene, and Radiation Control to determine PPE, monitoring, and/or other safety concerns.
- Identify applicable IWD for the sampling event, verify with MDA-B Operations, Industrial Hygiene, and Radiation Control that conditions at the sample location are within the limitations of the IWD.
- If the IWD is no longer applicable and/or an IWD does not exist prepare a new IWD for the sampling event.
- Provide a copy of the applicable IWD to RP-1 Team Leader to initiate an RWP.
- Review and discuss procedures and QA/QC concerns applicable to each sampling event.
- Assemble sample containers, documentation, equipment and other necessary supplies as identified in Attachments A – H.
- Prepare and conduct a pre-job briefing in accordance with P300.

8.2 Performance

Sampling personnel will expeditiously collect, label, preserve (if appropriate), package, store, and transport samples collected at MDA-B to ensure that holding times are not exceeded. This includes the following:

- Preserving, handling, packaging, and transporting samples in accordance with this SAP and the associated implementing procedures.
- Labeling of samples and waste items/containers to prevent sample misidentification.
- Decontamination of sampling equipment (if applicable) between samples.
- Changing gloves between samples.
- Completion of sampling documentation including the field logbook and chain of Custody (COC) forms/records.
- Affixing integrity seal(s) to the sample container(s)/coolers prior to transportation.
- Accountability for the sample at all times until the sample is relinquished to analytical personnel. Sampling personnel maintain custody of filled sample bottles (with integrity seal affixed) by keeping them in their possession, within view, locked or sealed to prevent tampering, or bring them into an area under lock and key with controlled access.
- Verification/Validation that all sample bottles have been correctly identified and labels have sample number, preservatives, date, and time. This includes a cross-check between label information for filled sample bottles against information recorded in the field logbook.

8.3 Post-Sampling/Decontamination

Sample technicians/personnel will conduct post sampling/decontamination activities. This includes:

- All sampling equipment leaving the sampling site (referred to as the exclusion zone) must be decontaminated. Decontamination methods include physical removal, chemical inactivation, or a combination of physical and chemical means.
- Coordination with the assigned WMC to package and disposal of waste generated during sampling operations.
- Preparation of samples for transport to analytical facilities in compliance with applicable DOT regulations.
- Ensuring that an RCT has completed a radiological survey tag for all sample containers/coolers to release them for transport to the analytical laboratory.
- Obtain a copy of the radiological survey tag for the sampling records.
- Transportation of samples to the analytical laboratory and/or Sample Management Office (SMO).

9. CHARACTERIZATION/IDENTIFICATION STRATEGY

The characterization and identification of waste materials generated due to the remediation operations at MDA-B and the excavation of the waste from the disposal trenches and cells will be completed using the following:

- Acceptable Knowledge (AK).
- Environmental/Field Screening and/or Sampling Data (e.g., instrumentation readings to determine Material and Risk).
- Process Knowledge/Existing Documents Associated with the Remediation, and Waste Characterization Efforts (e.g., MSDS for Dust Suppression).
- HazCat® field analysis to identify unknowns and determine chemical compatibility for waste packaging.
- Direct Sampling for both radiological and chemical contaminants.

9.1 Acceptable Knowledge

Acceptable knowledge (AK) generally consists of historical and analytical documentation that provides sufficient data to characterize and item or material for waste disposal. The AK data/documentation that is available for MDA-B is limited and will be used as follows:

- Waste Materials/Items with a composition that is known to be hazardous (e.g., batteries, thermometers, pumps with mercury seals, leaded glass, lead bricks, lead shielding, asbestos insulated furnaces). These items do not have to be sampled to be characterized as hazardous. They do require characterization for radiological composition to meet the WAC of the treatment and/or disposal facility.
- Unspent chemicals from sealed (never opened) containers with readable labels.
- Consistent/homogeneous waste streams (e.g., concrete from the same area that is relatively homogenous).
- Waste materials/items with liquids and/or residues that can be sampled. In this case the analytical results from the liquid and/or residue can be used as AK to support treatment and/or disposal of the material/item that it originally came from.
- Contact waste streams (e.g., PPE, DIF sampling equipment) characterized based on the contaminated waste stream it came into contact with.

AK in these cases does not always apply to both the chemical and radiological components. The appropriate waste management and compliance personnel will be consulted if there is question on legitimacy of AK for a waste determination.

9.2 Field Screening

Field surveys for detection of radioactivity will include direct measurements of surface areas (direct scans) and removable surface measurements of surface areas (smear surveys) performed by an RCT. Other measurements include in situ gamma field measurements and field scanning measurements. The in situ gamma field measurements will determine gamma radioactivity to provide characterization data and an assessment of MAR until analytical laboratory results are received. These measurements will be used to provide semi-quantitative information about the extent of concentrations of residual radioactivity. These measurements will also tentatively identify items/containers that are transuranic (TRU).

Field screening will also include industrial hygiene instrumentation to monitor IDLH, toxic gases, dust, and other parameters that could present a hazard to personnel who must enter the enclosures periodically to sort/segregate waste items, collect samples, label waste containers, and close waste containers.

9.3 HazCat® Identification

The excavation of waste from the disposal trenches/cells at MDA-B are expected to generated anomalies, unknowns, and chemicals that must be segregated into compatibility groups and identified to determine the appropriate off-site waste treatment and/or disposal facility to which it will be shipped. Sampling personnel will utilize HazCat® Kits (or equivalent) to perform field sampling and testing to categorize and identify anomalies, unknowns, and chemicals using common reagents, logic charts, and simple tests (e.g., pH paper). Identification of materials using HazCat methods will generally be performed at the DIF but may also be performed inside the excavation enclosures under limited conditions.

9.4 Direct Sampling

Direct sampling will be performed to provide analytical data to meet off-site Waste Acceptance Criteria, assess overburden/layback compliance with residential contaminant levels, assess adequate clean up of the trenches to residential contaminant levels, and to determine the extent of contamination beyond the trench boundaries, if any.

Samples will be collected using Environmental Protection (EP) directorate procedures and/or IWDs. The most recent versions (as posted on the ADEP website) of the following EP sampling procedures will be used:

- SOP-06.09, Spade and Scoop Method for Collection of Soil Samples
- SOP-06.10, Hand Auger and Thin Wall Tube Sampler
- SOP-06.15, COLIWASA Sampler for Liquids and Slurries
- SOP-5194, Chip Sampling of Porous Surfaces

If an EP procedure is not adequate to collect the necessary sample(s) of any given waste stream, an IWD will be prepared that is specific to that sampling event. The IWD and variance from this SAP will be documented in the field logbook.

10. SAMPLE MANAGEMENT

The following sections identify the management requirements that will be following to collect samples for material and waste characterization.

10.1 Sample Collection/Handling

Sampling personnel must minimize contamination of the collected samples by using sampling equipment that is uncontaminated. When necessary, sampling personnel must decontaminate the sampling equipment used for collecting solids, soils, sludge's, or sediments. All samples will be collected carefully and sampling personnel will change gloves between each sample to avoid contaminating clean equipment or cross contaminating samples.

10.1.1 Procedures

Samples will be managed in accordance with EP Directorate procedures. The most recent versions (as posted on the ADEP website) of the following EP sampling procedures will be used:

- SOP-5056, Sample Containers and Preservation
- SOP-5057, Handling, Packaging, and Transporting Field Samples
- SOP-5058, Sample Control and Field Documentation
- SOP-5059, Field Quality Control Samples
- SOP-5061, Field Decontamination of Equipment

10.1.2 Sample Numbering

10.1.3 Samples Collected

Samples collected at MDA-B will be assigned unique, sequential, and specific sample ID numbers by the SMO prior to the sampling event. The SMO will also provide the associated paperwork, sample containers, and labels. Sample Labels and Seals

Sampling personnel will ensure that all samples are labeled to prevent sample misidentification. Preprinted sample labels ensure that sampling personnel do not omit necessary information. Sampling personnel must attach a sample label to each sample they collect. Sample labels may be filled out before collection to minimize handling of the sample containers. Sample labeling will also include a container ID label so that individual samples can be traced back to the container/waste item it came from.

Sampling personnel attach the sample label to the sample container at the time of sample collection and are required to track samples from collection to analysis and to correlate the analytical results to the original waste stream. The sample label includes the sample number, the preservatives added, the date and time sampled, and the sampler's initials. Personnel who sample hazardous materials and PCBs or who sample materials that have been in a radiological controlled area can encounter materials with known or unknown radioactive constituents. A RCT must complete a survey tag for this material before personnel can accept any radioactive wastes or suspect radioactive material.

After attaching the sample label, sampling personnel must attach an integrity seal to the sample container. The integrity seal indicates if any person tampers with the container or if its integrity is in any way impaired.

10.1.4 Container Identifier Labels

Sampling personnel will place a container identifier label on the original waste container (i.e., the container from which the sample was collected). This label is vital to ensuring that analytical results are applied to the correct container of waste. Sampling personnel write the following information on the container identifier label:

- Sample date
- Sampling personnel
- Sampling group and sampling group phone number
- Constituents for which the waste was sampled (i.e., VOC, SVOC, metals)
- Sample reference number

After collecting the samples and properly labeling and sealing the sample bottles, sampling personnel will complete the container identifier label and affix it to the container. If the container is located inside the enclosure, sampling personnel will give the label to excavation personnel who will affix it to the container prior to moving it into storage pending analysis. Sampling personnel must make all entries on all records with indelible, blue or black ink. All entries should be legible, consistent, direct, and succinct. Sampling personnel must ensure the records are identifiable, retrievable, and protected against damage, deterioration, and loss.

10.2 Sample Inspection, Preparation, Analysis

10.2.1 Hold Times and Preservation

Sampling personnel must deliver samples to the analytical laboratory as soon as possible after collection to ensure that established sample holding times are not exceeded. The holding time is the maximum amount of time the sample can be held before analysis, and begins the date and time the sample is collected. If sample holding times are exceeded, the analytical data may be considered invalid because an important QA element has not been met. Sampling personnel must ensure proper completion of the Chain of Custody (COC) form upon collecting the sample and relinquishing it to analytical personnel. This ensures that sample holding times can be determined.

Sampling personnel must follow guidance for sample preservation procedures, using premeasured ampoules of recommended preservatives as appropriate. The sample must retain the properties of the original waste from the time of sampling to analysis. Degradation or alteration of the sample through exposure to air, excessive heat or cold, microorganisms, or contaminants from the container must be avoided. Volatilization, loss of acidic gases, and biodegradation can be reduced by storing and transporting the samples at a reduced temperature, approximately 4°C. Sample hold times and perseveration requirements are provided in Attachments A – H.

10.2.2 Analysis

10.3 Sample Documentation and Management

Sampling personnel will complete and maintain records that document the sampling and analysis of waste streams to assure quality. These records also ensure that the analytical results can be traced back to the waste that was sampled. Records pertinent to the waste sampling program include all field and laboratory records generated by the activities performed in accordance with this plan and are listed below.

- Field logbook
- COC
- Sampling equipment maintenance and calibration forms.
- Written requests and approvals for any temporary modifications to sample collection procedures.

Access to sampling documentation must be controlled. Personnel making changes to a document will do so by drawing a single line through the original information so it remains legible, writing the correct information adjacent to the original information, and initialing and dating the change.

10.3.1 Field Logbook

Field logbooks are documents that serve as the written record for all field data gathered, field observations, field equipment calibrations, samples collected for laboratory analysis, and sample custody. Logbooks are maintained to ensure that field activities are properly documented as they relate to site safety meetings and that site work is conducted in accordance with the health and safety procedures. The field logbook(s) for sampling at MDA-B will be a spine-bound notebook with pre-numbered consecutive pages, containing all information pertinent to the sampling operation. The field logbook will remain in the custody of sampling personnel at all times while in the field and will be locked up at the end of the day.

All entries to field logbooks will be made using permanent ink pens or markers, and any entry error will be amended by drawing a single line through the entry and initialing and dating the correction by the person making the entry. The creation and use of field logbooks will be performed in accordance with SOP-5058, *Sample Control and Field Documentation*. This will include the following information:

- Sampling date and time
- Collector's name(s)
- Possible sample hazards
- Weather conditions

9.3.1 Field Logbook (continued)

- Unique sample number
- Sample type and volume
- Analysis requested
- Remarks (see below)
  - Field observations and measurements
  - Deviations from or anomalies in the sampling procedures
  - Lot number and expiration date of preservatives (if applicable)
  - Preservation method used (if applicable)
  - Waste characteristics (category, matrix, homogenous/heterogeneous, solid/liquid)
  - Sample container and tool types
  - pH of the waste (if applicable)
  - Sample point location
  - Sampling strategy
  - Sample identification (duplicate, field blank, etc.)
  - Physical condition of the original waste container (if applicable0

10.3.2 Chain-of-Custody Record

The chain-of-custody (COC) procedures will begin immediately after collection of the first sample in accordance with SOP-5058, Sample Control and Field Documentation. All samples collected will remain in the custody of a sample technician/team member until transported offsite. Each time a sample is transferred from the custody of sampling personnel to analytical personnel, the person relinquishing the sample must complete the required information on a COC Record.

This record allows the sample to be tracked throughout the analytical process, assuring control over tracking of the sample and its corresponding analytical results. If discrepancies are noted, immediate corrective action will be sought with the sampling team member(s) identified on the sample label and/or COC forms as the originator of the sample. If discrepancies cannot be corrected with the sampling team members, the Sample Coordinator will be sought to correct sample labeling or COC discrepancies prior to transporting samples offsite.

The Sample Coordinator will retain a copy of the signed COC form prior to the samples being shipped. The COC forms will also be included with the data assessment packages. The original COC form will be provided as part of the laboratory-generated data package and will become part of the project administrative record. The COC form provided with the data package will correspond to the sample locations for which data are reported therein.

11. QUALITY CONTROL

Sampling personnel will prepare field QC samples as specified in the Attachments A- F of this SAP and SOP-5059, *Field Quality Control Samples*. These samples will include blanks, duplicates, and splits (as requested by the NMED) to ensure that minimum precision and accuracy are obtained for sampling activities at MDA-B. Table 10.1 identifies the QC samples that will be required during overburden/layback sampling and the appropriate frequency.

Table 1

Quality Control Samples

QC Sample Type	Frequency	Purpose
Field Duplicate	1 sample/day OR 1 sample for every 20 Sample Suites Collected	To evaluate reproducibility of the sampling technique
Equipment Rinseate Blank	1 sample/day OR 1 sample for every 20 Sample Suites Collected	To evaluate decontamination procedures
Trip Blank	1 sample/day OR 1 sample for every 20 Sample Suites Collected (when VOC and SVOC samples are collected)	To determine contamination during storage and transportation

11.1 Blank Samples

Sampling personnel will prepare, containerize, preserve and handle blank samples to verify the quality control associated with sampling activities. The data obtained from blank samples will be used to identify contamination introduced during the sampling and transportation activities.

- ***Trip Blank*** - A trip blank contains laboratory-grade distilled or deionized water or some other analyte-free media (obtained from the analytical laboratory) that is measured into a sample container in the analytical laboratory. The trip blank containers should be of the same lot and type as those in which the waste samples will be placed. Sampling personnel carry the trip blank through the entire sampling event and sample transportation. The trip blank is used to document any contamination attributable to field handling and shipping procedures. Sampling personnel label the trip blank with a sequential number similar to waste samples and designate it as a trip blank in the field logbook. Trip blank samples are only collected when VOC and SVOC samples are collected.
- ***Field Blank*** - Sampling personnel prepare the field blank during the sampling event with laboratory-grade distilled or deionized water or analyte-free media. In preparing the field blank, sampling personnel must open the container, introduce media (and preservative if added to the samples), and close the container using the same sequence followed for each waste sample. Sampling personnel must label the field blank with a sequential number similar to waste samples and designate it as a field blank in the field logbook. Sampling personnel seal, label, package and transport the field blank the same as waste samples. Analysis of the field blank provides data on potential container, preservative, or media contamination.
- ***Field Soil Blank*** - When there is extensive soil sampling, sampling personnel prepare soil blanks in the field during the sampling event. Field soil blanks can be prepared from washed silica sand. In preparing the field soil blank, sampling personnel must open the container, introduce media (and preservative, if added to the samples), and close the container using the same sequence used for each waste sample. Sampling personnel label the field soil blank with a sequential number similar to waste samples and designate it as a field soil blank in the field logbook. Sampling personnel seal, label, package, and transport the field soil blank the same as waste samples. Analysis of the field soil blank provides data on potential container, preservative, or distilled or deionized water contamination to evaluate potential contamination as a result of field handling procedures or shipping.
- ***Equipment Rinsate Blank*** – Equipment rinsate blanks will be collected using organic/analyte-free water placed in contact with the decontaminated sampling equipment under field conditions to evaluate the effectiveness of equipment decontamination or to detect sample cross contamination.

11.2 Duplicate Samples

Sampling personnel will collect duplicate samples at the same time, from the same location in the container, with the same apparatus, and place the duplicate samples into identical containers prepared in the same way and filled to the same volume. Sampling personnel preserve and handle all duplicate samples identically. Sampling personnel label duplicate samples with a sequential number similar to other waste samples, and designate them as duplicate samples in the field logbook. The analysis of duplicate samples using the same procedure and instrument verifies the reproducibility of the analytical data.

11.3 Split Samples

Split samples will ONLY be collected at the request of the New Mexico environment Department (NMED) and/or MDA-B Project Manager. A split sample is a sample that is divided into equal portions that are analyzed by different accepted analytical techniques or by separate laboratories. They are typically collected to validate data obtained from different analytical methods or analytical laboratories. Sampling personnel must collect these samples with great care to ensure that each portion has the same composition. If the split sample is requested by NMED they will send sampling personnel to collect the sample.

12. ANALYTICAL LABORATORY REQUIREMENTS

Materials and wastes requiring characterization will be analyzed by LANL-approved laboratories.

12.1 Analytical Results Reports

Analytical personnel will generate a report of the analytical results for each sample submitted. The following information must be included in each report:

- Analytical request number
- Unique sample number (provided by sample collector)
- Unique sample number assigned by the analytical laboratory (if applicable)
- Date the sample was received by analytical personnel
- Date of analysis
- Name of the analyst (or initials)
- Analytical parameters requested
- Analytical results for each parameter
- Analytical methods used for each parameter
- Data from QC samples (e.g., replicates, matrix spikes, and surrogates) introduced by the analytical laboratory into the sample analysis stream

12.2 **Analytical Results Reports** (continued)

The analytical reports will be submitted to the Sampling Coordinator and/or QC Coordinator, who will review the reports and determine that the data package is complete. The data will then be mailed to the Environmental Engineer, Environmental Generalist, and WMC for evaluation against the MDA-B Work Plan requirements and off-site Waste Acceptance Criteria (WAC).

12.3 Analytical Data

The following sections outline the procedures to be employed in evaluating the quality of MDA B sample data. These sections include discussions on data management, the LANL-specific procedures to be used for validating project data, and the procedure for completion of the DQA on Phase I results.

12.3.1 Data Management

The contract laboratory will manage copies of all data generated for the sampling project along with all original documentation that accompanies the data. Laboratory logbooks, other internal documentation, corrective action measures, and data packages will be retained by the laboratory for 5 years or until such time as directed by the SM that the project can be closed out. All electronic deliverables and associated instrument and computer backups will also be retained for this period to ensure that data can be reproduced if necessary. The laboratory shall maintain electronic and hard-copy records sufficient to recreate each analytical event conducted pursuant to the laboratory SOW, the analytical method requirements, and this SAP.

Through its capture in the MDA B database, data generated in the FL will be retained as part of the administrative record for the project. Following certification by the QA designee of field results, they will be imported into the project database where they will remain in perpetuity as part of the permanent project record.

12.3.2 Data Validation

Data validation will be completed in accordance with the following LANL data validation procedures:

- SOP-5161, Routine Validation of Volatile Organic Compound Analytical Data
- SOP-5162, Routine Validation of Semivolatile Organic Compound Analytical Data
- SOP-5165, Routine Validation of Metals Analytical Data
- SOP-5166, Routine Validation of Gamma Spectroscopy, Chemical Separation Alpha Spectrometry, Gas Proportional Counting, and Liquid Scintillation Analytical Data
- SOP-5168, Routine Validation of General Chemistry Analytical Data.

11.3.2 Data Validation (continued)

All (100%) of the contract laboratory data will undergo data validation to ensure that it meets the DQOs. The data validators will complete a validation package that complies with the listed SOPs and submit it for review to the PQO. The PQO will identify any inaccuracies, typographical errors, or items requiring additional effort to the data validator. After corrections have been made, the data validator will submit the revised report to the PQO, who will perform a final review of the report. Upon approval, both the validator and the PQO will sign the report cover page. Once complete, the data will be provided to the DQA team for use in data evaluation.

12.3.3 Data Quality Assessment

The DQA process is used to determine whether the collected data meet the project DQOs. The DQA for the MDA B characterization activities will be completed in accordance with the ***Data Quality Assessment: A Reviewer's Guide*** (EPA 2006b) and *Data Quality Assessment: Statistical Tools for Practitioners* (EPA 2006c). To complete the DQA, the data usability will be applied to the assumptions made in preparing this SAP. Once the data are adequately examined, appropriate statistical methods will be selected and employed to determine whether project goals were achieved to provide the appropriate inputs (e.g., 95% UCL) to the waste determinations. The degree of confidence with which conclusions can be drawn will then be quantified and discussed in the DQA.

13. TRANSPORTATION OF SAMPLES OFFSITE

Transportation of samples will be performed in accordance with SOP-5057, *Handling, Packaging, and Transporting Field Samples*. Samples will typically be secured in a cooler as they are collected at the excavation enclosures and/or the DIF. When the cooler has reached capacity, two copies of the completed chain-of-custody form will be placed in a sealable plastic bag and taped to the inside surface of cooler lid. The RCT will perform external radiation surveys of the sample containers to determine whether samples can be moved from the site for shipment to the analytical laboratory or more rigorous sample packing is required.

Shipping personnel will package and label samples, as appropriate, in accordance with U.S. Department of Transportation shipping requirements. Upon completion of radiation surveys, the survey forms will be added to the sealable plastic bag containing the chain-of-custody form; the cooler will be resealed, and custody seals will be affixed to the sample cooler to ensure the integrity of sample custody between MDA B and analytical laboratory.

14. DECONTAMINATION OF SAMPLING EQUIPMENT

The sampling equipment employed is likely to be contaminated during sampling activities. To prevent cross-contamination between sample locations, the equipment will undergo decontamination. Most of the sampling equipment will be single-use disposal equipment, such as scoops, spoons, and shovels to the extent possible to minimize decontamination waste and to prevent cross contamination between samples. If use of disposable equipment is not possible, the sample equipment (such as hand augers) will be decontaminated as described in SOP-5061, Field Decontamination of Drilling and Sampling Equipment.

15. VARIANCES

Variances from this SAP will be documented in the sampling logbook.

16. HEALTH AND SAFETY

MDA-B is a less than Hazard Category 3 or Radiological and Low Chemical Hazard Site, which is posted as a Radiation Control Area. Identified and anticipated hazards associated with the MDA B FSP and the TA21-MDAB-PLAN-00015, *Site Specific Health And Safety Plan (SSHASP) TA-21 MDA-B, Investigation & Remediation Project* and task-specific integrated work documents (IWDs). These documents contain details related to job-specific hazards and the provisions for safeguarding field team members against hazards. To ensure all members of the field team are aware of job safety hazards, they will be discussed among the field team during daily pre-job briefings. These briefings will include a discussion of known hazards and any change in site conditions that may result in additional hazards. Each field team member must fully understand the SSHASP and IWDs, and each member must have the appropriate level of training relative to site-specific hazards prior to participating in field sampling activities.

17. WASTE MANAGEMENT

Sampling personnel will make every effort to minimize the amount of waste generated due to sampling. This will include decontaminating equipment for reuse and removing excess packaging from sampling materials before entering the radiological control area at MDA-B. Waste that is generated during sampling will be managed in accordance with the following:

- EP2010-0203, WCSF: MDA-B Excavation.
- EP2010-0207, WCSF: MDA-B Anomalies, Unknowns, and Chemicals
- TA21-MDAB-PLAN-00014, Waste Management Plan for Material Disposal Area (MDA) B

18. TRAINING

Sample technicians/personnel must be qualified prior to collecting waste characterization samples. This includes training to this SAP, the SSHASP, applicable sampling procedures and the following minimum requirements:

- 40 Hour HAZWOPER
- Radiological Worker II
- RCRA Personnel Training

RCRA Refresher Training

All sample technicians/personnel will also be required to complete the required reading that is associated with the use of the EP SOPs referenced in this SAP. The Sample Coordinator will maintain a binder with training records (or copies) and the associated plans/procedures to ensure that personnel are qualified prior to each sampling event.

19. RECORDS

Table 2 identifies all of the records that will be generated by this plan.

Table 2

Quality Assurance Records

Identification	Record Type	Protection/Storage Methods	Processing Instructions
Field Log Book	QA Record	Records SHALL have a reasonable level of protection to prevent loss and degradation. Records SHALL be maintained in a fire-rated file cabinet when not in use.	When records are ready for final disposition, they are transferred to TA21-Document Control in accordance with TA21-PLAN-00001
Sample Log Book			
Chain of Custody Forms			
Request for Analysis Forms			
Analytical Data			

20. REFERENCES

LA-UR-06-6918, *EP2006-0783, Investigation/Remediation Work Plan for Material Disposal Area B, Solid Waste Management Unit 21-015, at Technical Area 21*, Revision 1.

ENV-RCRA: 07-223, Request for Approval of an Area of Contamination for the Investigation of Solid Waste Management Unit 21-015, Material Disposal Area B, at Technical Area 21, Los Alamos National Laboratory.

TA21-MDAB-PLAN-00015, *Site Specific Health And Safety Plan (SSHASP) TA-21 MDA-B, Investigation & Remediation Project*

EP2010-0203, *WCSF: MDA-B Excavation.*

EP2010-0207, *WCSF: MDA-B Anomalies, Unknowns, and Chemicals*

TA21-MDAB-PLAN-00014, *Waste Management Plan for Material Disposal Area (MDA) B*

SOP-5194, *Chip Sampling of Porous Surfaces*

SOP-5056, *Sample Containers and Preservation*

SOP-5057, *Handling, Packaging, and Transporting Field Samples*

SOP-5058, *Sample Control and Field Documentation*

SOP-5059, *Field Quality Control Samples*

SOP-5061, *Field Decontamination of Equipment*

Meyer 1952, 28154. Meyer, D.D. January 31, 1952, *Location of Contaminated Waste Burial Pits (Area A, B, and C)*, Los Alamos Scientific Laboratory memorandum for D.D. Meyer, H-1, to S.E. Russon, ENG-3, Los Alamos, New Mexico.

DOE 1986, 08657. DOE, October 1986. *Comprehensive Environmental Assessment and Response Program Phase I: Installation Assessment, Los Alamos National Laboratory.*

Merrill 1990, 11721. Merrill, E.S., March 1990, *A History of Waste Disposal at Technical Area 21 1943 – 1978,*" prepared for the U.S. Department of Energy.

NMED 1/31/07, Approval with Modifications for the Investigation/Remediation Work Plan for Material Disposal Area B, Solid Waste Management Unit 21-015, at Technical Area 21, Revision1, Los Alamos National Laboratory

NMED 10/2/07, Approval of An Area of Contamination for the Investigation and Remediation of SWMU 21-015, Material Disposal Area B, at Technical Area 21, Los Alamos National Laboratory

SOP-06.10, *Hand Auger and Thin Wall Tube Sampler*

SOP-06.09, *Spade and Scoop Method for Collection of Soil Samples*

SOP-06.15, *COLIWASA Sampler for Liquids and Slurries*

LA-UR-07-2379, *Material Disposal Area B: Process Waste History*, Los Alamos National Laboratory, Los Alamos, New Mexico, 2007.

LA-UR-06-3693, *MDA-B Historical Context*, Los Alamos National Laboratory, Los Alamos, New Mexico, 2006.

ATTACHMENT A
OVERBURDEN/LAYBACK

A.1 MATERIAL DESCRIPTION

Overburden/layback consists of fill, base course, and soil used to cover and/or grade the trenches/waste cells during historical operations or during site preparation activities for remediation at Material Disposal Area B (MDA-B).

A.2 OBJECTIVE

The purpose of this attachment is to ensure that representative samples are collected from the overburden/layback excavated from inside the enclosures. The analytical data obtained from these samples will be used to support reuse of the soil as fill. The conditions under which the overburden/layback can be reused at MDA-B are as follows:

- It is not in contact with waste from the trench/disposal cell.
- Analytical data for every 50 cubic yards (yd^3) (radiological and chemical) that indicate the material is NOT hazardous and that contaminants are below residential cleanup levels (NMED 1/31/07).
- Material is reused ONLY at the bottom of the excavated trench (NMED 1/31/07).

If the conditions specified above cannot be met, the soil will be packaged and disposed of at an appropriate off-site facility for the waste stream (i.e., Industrial, low-level waste [LLW], or mixed low-level waste [MLLW]).

A.3 PROCEDURES

- SOP-06.10, *Hand Auger and Thin-Wall Tube Sampler*
- SOP-06.09, *Spade and Scoop Method for Collection of Soil Samples.*
- SOP-5056, *Sample Containers and Preservation*
- SOP-5057, *Handling, Packaging, and Transporting Field Samples*
- SOP-5058, *Sample Control and Field Documentation*
- SOP-5059, *Field Quality Control Samples*
- SOP-5061, *Field Decontamination of Equipment*

A.4 EQUIPMENT

- 5-gallon bucket
- Gloves (nitrile or latex)
- Trowels/Shovels
- Dry Decontamination Materials
- Sample Labels, Container Labels, and Tamper Seals
- Logbook
- Pen and Permanent Marker
- Chain-of-Custody (COC) Form/Request for Analysis Form(s)
- Sample containers and preservatives as specified in Table A.1.

A.5 PRECAUTIONS AND LIMITATIONS

- A minimum of two persons are required to perform sampling activities for safety during sampling activities.
- Sampling personnel must not eat, drink, smoke, apply lip balm, chew tobacco, or gum while sampling or while in the work area.
- The person(s) collecting samples and filling sample containers must change gloves between samples.
- Sampling personnel must dispose of used, disposable equipment and gloves; used ampules and wipes; contaminated containers; and any other waste generated during sampling operations in the appropriate waste container on site.
- When adding preservatives or other solutions (e.g., acids, bases, or water) to materials being sampled, dangerous chemical reactions might occur.

A.6 DATA QUALITY OBJECTIVES

A.6.1 Problem Definition

There are several thousand cubic yards of overburden and/or layback (fill, base course, soil) that were used to cover and/or grade the trenches/waste cells at MDA-B during both historical operations and more recent site preparation activities for remediation. This material may be reusable as fill at the site, however, NMED 1-31-07 requires the collection of one sample for every 50 yd^3 of overburden material intended for use as backfill , in order to confirm that the material is nonhazardous (NOT Resource Conservation and Recovery Act [RCRA] regulated) and meets the residential cleanup levels (chemical and radiochemical contaminants).

A.6.2 Decision Statement

The following Principal Study Question (PSQ), Alternative Actions (AA), and decision statement (DS) are associated with sampling of overburden/layback:

PSQ: Can the overburden/layback be reused as fill at MDA-B?

AA1: Overburden/layback that has waste (i.e., aspalt, debris, visible staining, glass, cardboard, personal protective equipment [PPE]) in contact with it WILL NOT be stockpiled and reused.

AA2: Overburden/layback that is NOT RCRA regulated and is below residential screening levels for radiological and chemical contaminants can be stockpiles for reuse as fill per NMED 1-31-07.

AA3: Overburden/layback that is RCRA regulated waste will be packaged and disposed of as Hazardous Waste.

AA4: Overburden/layback that is RCRA regulated and is above residential screening levels for radiological contaminants will be packaged and disposed of as Mixed Low-Level Waste.

AA5: Overburden/layback that is NOT RCRA regulated and is above residential screening levels for radiological contaminants will be disposed of as LLW.

AA6: Overburden/layback that is NOT RCRA Regulated, is above residential screening levels for chemical contaminants, and is below residential screening levels for radiological contaminants will be disposed of as industrial waste.

DS: The overburden/layback will either be stockpiled for reuse as fill or disposed of as an appropriate waste type (Industrial, Hazardous, MLLW, LLW).

A.6.3 Decision Inputs

The following decision inputs are applicable:

DI1: One sample collected for every 50 yd^3 of overburden/layback to be reused as fill at the bottom of the MDA-B trenches.

DI2: Analytical results for each sample that include Total/TAL metals, Radionuclides (by alpha and gamma spectroscopy), isotopic uranium, isotopic plutonium, tritium, strontium-90, Volatile organic compounds (VOCs), Semi-volatile organic compounds (SVOCs), dioxins/furans, polychlorinated biphenyls (PCBs), explosive compounds, perchlorate, nitrate, cyanide, Pesticides/Herbicides.

The action levels (AL) are identified in LA-UR-06-6918, *Investigation/Remediation Work Plan for Material Disposal Area B, Solid Waste Management Unit 21-015, at Technical Area 21, Los Alamos National Laboratory* as follows:

AL1: Regulatory threshold concentrations as specified by RCRA in 40 CFR 261.24.

AL2: Characteristic properties (ignitability, corrosivity, and reactivity) as specified by RCRA in 40 CFR 261.21 – 23.

AL4: Residential soil screening levels (SSLs) for chemicals specified by EPA Region 6 and EP2006.1080).

AL5: Residential screening action levels (SALs) for radionuclides in soil specified by DOE 5400.5 and EP2006.1080.

A.6.4 Decision Rules

Decision rules (DRs) are specified to define the parameter(s) that characterize the population of interest. The following summarizes the parameters of interest for the PSQ and defines the decision pathway once they are characterized.

- **DR1:** If waste (i.e., asphalt, debris, containers, visible staining) is found in the overburden/layback the material must be handled as contaminated soil (see Attachment B).
- **DR2:** If the analytical results for the overburden/layback samples indicate that it is NOT RCRA regulated and is below residential screening levels (SSLs and SALs), it will be stockpiled for reuse as fill at the bottom of the MDA-B trenches/disposal cells.
- **DR3:** If the analytical results for the overburden/layback samples indicate that it is Hazardous, MLLW, LLW, or Industrial Waste it will be disposed of at an appropriate off-site facility.

A.7 PREREQUISITES

- Excavation personnel have confirmed that the overburden/layback to be sampled was not mixed with waste materials from the MDA-B trenches/disposal cells.
- IH and RCT personnel have confirmed that the overburden/layback does not present a hazard to sampling personnel (i.e., high radiological, IDLH, Corrosive).
- Sampling conditions are within the specifications of the associated IWD.

A.8 SAMPLING RATIONALE/FREQUENCY

The frequency and rationale for sampling of overburden/layback is specified by the LA-UR-06-6918 and amended by the corresponding approval letter NMED 1/31/07. These documents require the collection of one sample (suite) for every 50 yd^3 of overburden/layback intended for use as backfill, in order to confirm that the material is nonhazardous, meets the residential cleanup levels, or both. The samples will at a minimum be analyzed for the following:

- Total/TAL metals
- Radionuclides (by alpha and gamma spectroscopy), isotopic uranium, isotopic plutonium, tritium, strontium-90
- VOCs
- SVOCs
- Dioxins/furans
- Perchlorate
- Nitrate
- Cyanide
- Pesticides/Herbicides
- High Explosives (HE) Field Screening

Several other constituents will be analyzed for, as necessary, due to the site conditions and preliminary sample/screening results. This includes the following:

- If the analytical results for TAL metals indicate contaminates near regulated levels, the analysis for TCLP Metals will also be performed.
- If HE field screening results are positive, the soil will be sampled and analyzed for explosive compounds.
- Soil that is observed to have staining will be analyzed for total petroleum hydrocarbons (TPH) and polychlorinated biphenyls (PCBs).

Table A.1 provides the analytical methods and identifies the containers, preservatives, and hold times that are applicable to each.

Table A.1 – Methods, Containers, Preservatives, and Hold Times – Overburden/Layback

Parameter	Method No.	Container	Preservative	Hold Time	Rationale[a]
Total Metals: Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Ti, V, Zn	EPA 6010-B	500 mL Glass Jar	4°C	180 Days	Required by LA-UR-06-6918
Total Metals: Hg	EPA 7471A			28 Days	
TCLP Metals: As, Ba, Cd, Cr, Pb, Hg, Se, Ag,	EPA 1311/6010-B	500 mL Glass Jar	None	180 Days	Required ONLY if Totals are close to 20 times rule.
Total Cyanide	EPA 9012-A	125 mL Glass Jar	4°C	14 Days	Required by LA-UR-06-6918
Perchlorates	EPA 6850	4 oz Wide-Mouth Jar	4°C	28 Days	Required by LA-UR-06-6918
Nitrates/Nitrites	EPA 300.09	250 mL Glass Jar	4°C	28 Days	Required by LA-UR-06-6918
Volatile Organic Compounds	EPA 8260-B	4 X 40 mL Glass Vial	4°C, 2 Vials Na HSO4, 1 Vial CH3OH, 1 Vial None	14 Days	Required by LA-UR-06-6918
Semi-volatile Organic Compounds	EPA 8270-C	500 mL Glass Jar	4°C	14 Days	Required by LA-UR-06-6918
Organic Pesticides	EPA 8081-A	500 mL Glass Jar	4°C	14 Days	Required by LA-UR-06-6918
Organic Herbicides	EPA 8151-A				
PCBs	EPA 8082	250 mL Glass Jar	4°C	14 Days	Required by LA-UR-06-6918
High Explosives	EPA 8330/8321-A	Amber Glass/Teflon Lined Cap	4°C	14 Days	Required by LA-UR-06-6918
Dioxins/Furans	EPA 1613B	250 mL Glass Jar	4°C	30 Days	Required by LA-UR-06-6918
Total petroleum hydrocarbon (TPH)-GRO/DRO	EPA 8015-M	4 x 40mL Glass Vial	4°C, 2 Vials NaHSO4, 1 Vial CH3OH, 1 Vial None	14 Days	Required ONLY if the soil is stained, greasy, or discolored.
Tritium (liquid scintillation)	EPA 906.0	1 L Glass Jar	None	180 Days	Required by LA-UR-06-6918
Gamma spectroscopy	EPA 901.1	1 L Glass Jar	None	180 Days	Required by LA-UR-06-6918
Isotopic plutonium	HASL-300			180 Days	Required by LA-UR-06-6918
Isotopic uranium	HASL-300			180 Days	Required by LA-UR-06-6918
Total uranium	EPA 6020			180 Days	Required by LA-UR-06-6918
Strontium-90	EPA 905			180 Days	Required by LA-UR-06-6918
Americium-241	HASL-300			180 Days	Required by LA-UR-06-6918

a. LA-UR-06-6918, *Investigation/Remediation Work Plan for Material Disposal Area B, Solid Waste Management Unit 21-015, at Technical Area 21, Los Alamos National Laboratory.*

A.9 FIELD METHODOLOGY

Representative samples will be collected from the overburden/layback as follows:

1. The excavator will dump a bucket of overburden/layback on the edge of the trench and run its tines through it to verify that that waste is not present in the soil. Verification will typically be performed visually using cameras.
2. IH and RCT personnel will evaluate the material for high radiological content, IDLH, and other key remote monitoring criteria.
3. Overburden/layback that is confirmed to meet IH/RCT screening criteria and is waste free will then be containerized in an IP-1 roll off box (16 -18 yd^3).
4. Excavation will be halted when a minimum of 2 or maximum of 3 IP-1's are 95% full.
5. IH and RCT personnel will evaluate the safety conditions in the enclosure and allow entry of excavation personnel for the collection of composite samples.
6. A representative composite sample of material from each IP-1 will be collected into a single 5-gallon bucket using SOP-06.09, *Spade and Scoop Method for Collection of Soil Samples.* One bucket/composite sample for at least every 3 IP-1s (48 - 54 yd^3) will be collected.
7. An RCT will evaluate the 5-gallon bucket for release from the enclosure and it will be passed to sampling personnel outside the enclosure.
8. Sampling personnel will collect the sample suites and QC samples as specified by this SAP, SOP-5059, *Field Quality Control Samples*, and SOP-5056, *Sample Containers and Preservation.*
9. Sampling personnel will complete the appropriate sample documentation and label the sample containers in accordance with SOP-5058, *Sample Control and Field Documentation.*
10. Sampling personnel will decontaminate sampling equipment between samples in accordance with SOP-5061, *Field Decontamination of Equipment.*
11. Sampling personnel will package the samples in accordance with SOP-5057, *Handling, Packaging, and Transporting Field Samples.*
12. An RCT will screen the samples and transportation containers for radiological contamination prior to their transport to the Sample Management Office (SMO).
13. Sampling personnel will transport the samples to the SMO or laboratory in accordance with SOP-5057, *Handling, Packaging, and Transporting Field Samples.*
14. Excess material, if any, in the bucket will be handed back to the excavation personnel in the enclosure and placed back into one of the containers.
15. Containers will be closed by waste management personnel, screened for release from the enclosure by the RCTs, and moved to a temporary accumulation area pending analytical results.

ATTACHMENT B
CONTAMINATED SOIL

B.1 MATERIAL DESCRIPTION

Contaminated soil will consist of fill, base course, and soil that is mixed with small quantities of waste (i.e., glass, deteriorated card board, vials, stoppers, bits of plastic, personal protective equipment [PPE]) or was in direct contact with waste materials from the Material Disposal Area B (MDA-B) trenches/disposal cells.

B.2 OBJECTIVE

The purpose of this attachment is to ensure that representative samples are collected from contaminated soil excavated from inside the enclosures. The analytical data obtained from these samples will be used to support characterization, packaging, and disposal at an appropriate off-site facility.

B.3 PROCEDURES

- SOP-06.10, *Hand Auger and Thin-Wall Tube Sampler*
- SOP-06.09, *Spade and Scoop Method for Collection of Soil Samples*
- *SOP-5056, Sample Containers and Preservation*
- *SOP-5057, Handling, Packaging, and Transporting Field Samples*
- SOP-5058, *Sample Control and Field Documentation*
- SOP-5059, *Field Quality Control Samples*
- SOP-5061, *Field Decontamination of Equipment*

B.4 EQUIPMENT

- 5-gallon bucket
- Gloves (nitrile or latex)
- Trowels/Shovels
- Dry Decontamination Materials
- Sample Labels, Container Labels, and Tamper Seals
- Logbook
- Pen and Permanent Marker
- Chain-of-Custody (COC) Form/Request for Analysis Form(s)
- Sample containers and preservatives as specified in Table B.1.

B.5 PRECAUTIONS AND LIMITATIONS

- A minimum of two persons are required to perform sampling activities for safety during sampling activities.
- Sampling personnel must not eat, drink, smoke, apply lip balm, chew tobacco, or gum while sampling or while in the work area.
- The person(s) collecting samples and filling sample containers must change gloves between samples.
- Sampling personnel must dispose of used, disposable equipment and gloves; used ampules and wipes; contaminated containers; and any other waste generated during sampling operations in the appropriate waste container on site.
- When adding preservatives or other solutions (e.g., acids, bases, or water) to materials being sampled, dangerous chemical reactions might occur.

B.6 DATA QUALITY OBJECTIVES

The data quality objectives for materials/media sampled using this attachment are provided in Section 6.0 of this SAP.

B.7 PREREQUISITES

- IH and RCT personnel have confirmed that the contaminated does not present a hazard to sampling personnel (i.e., high radiological, IDLH, Corrosive).
- Sampling conditions are within the specifications of the associated IWD.

B.8 SAMPLING RATIONALE/FREQUENCY

The frequency and rationale for sampling of contaminated soil is determined from the Waste Acceptance Criteria (WAC) of the potential off-site disposal sites, the waste materials the soil was in contact with (i.e., high explosives, polychlorinated biphenyl contaminated equipment). All contaminated soil samples will at a minimum be sampled and analyzed for the following:

- Total/TAL metals
- Radionuclides (by alpha and gamma spectroscopy), isotopic uranium, isotopic plutonium, tritium, strontium-90
- Volatile Organic Compounds (VOC)
- Semi-Volatile Organic Compounds (SVOC)
- Pesticides/Herbicides
- High Explosives Field Screening

Several other constituents will be analyzed for, as necessary, to meet the WAC of the disposal facility and/or due to conditions and preliminary sample/screening results. This includes the following:

- If the analytical results for TAL metals indicate contaminates near regulated levels, the analysis for TCLP Metals will also be performed.
- If HE field screening results are positive, the soil will be sampled and analyzed for explosive compounds.
- Soil that is observed to have staining will be segregated, sampled, and analyzed for total petroleum hydrocarbons (TPH) and PCBs.
- Soil excavated from an area where a fire has occurred during excavation and/or a historical fire is evident will be sampled and analyzed for dioxins/furans.)
- Soil observed to be in contact with PCB contaminated materials will be sampled and analyzed for PCBs.

Table B.1 provides the analytical methods and identifies the containers, preservatives, hold times, and rationale that are applicable to each.

B.9 FIELD METHODOLOGY

Representative samples will be collected from the overburden/layback as follows:

1. The excavator will dump a bucket of excavated material/soil on the edge of the trench and run its tines through it to segregate waste from the soil. The excavator may also use a screen to segregate larger waste items from the soil. Verification will typically be performed visually using cameras.
2. IH and RCT personnel will evaluate the material for high radiological content, IDLH, and other key remote monitoring criteria.
3. Soil that is stained/discolored, contained spilled or broken containers, and/or is associated with readings from IH monitoring instrumentation that indicates elevated VOCs/SVOCs will be segregated (i.e., set aside, separate container) by the excavator for biased sampling.
4. Soil that is confirmed to meet IH/RCT screening criteria will then be containerized in IP-1 roll off boxes (20 -35 yd^3 filled to 80%).
5. The excavator will set aside portions of the soil (small stockpile) as the IP-1's are filled for composite sampling.

Table B.1 – Methods, Containers, Preservatives, Hold Times, and Rationale – Contaminated Soil

Parameter	Method No.	Container	Preservative	Hold Time	Rationale
Total Metals: Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Ti, V, Zn	EPA 6010-B	500 mL Glass Jar	4°C	180 Days	Required to meet WAC for disposal facilities.
Total Metals: Hg	EPA 7471A			28 Days	
TCLP Metals: As, Ba, Cd, Cr, Pb, Hg, Se, Ag,	EPA 1311/6010-B	500 mL Glass Jar	None	180 Days	Collect the sample and archive. If the Totals are close to 20 times rule limits send the sample for analysis.
Volatile Organic Compounds	EPA 8260-B	4 X 40 mL Glass Vial	4°C, 2 Vials Na HSO4, 1 Vial CH3OH, 1 Vial None	14 Days	Required to meet WAC for disposal facilities.
Semi-volatile Organic Compounds	EPA 8270-C	500 mL Glass Jar	4°C	14 Days	Required to meet WAC for disposal facilities.
Organic Pesticides	EPA 8081-A	500 mL Glass Jar	4°C	14 Days	Required to meet WAC for disposal facilities.
Organic Herbicides	EPA 8151-A				
Tritium (liquid scintillation)	EPA 906.0	1 L Glass Jar	None	180 Days	Required to meet WAC for disposal facilities.
Gamma spectroscopy	EPA 901.1	1 L Glass Jar	None	180 Days	Required to meet WAC for disposal facilities.
Isotopic Plutonium, Uranium, Americium-241	HASL-300				
Total Uranium	EPA 6020				
Strontium-90	EPA 905				
High Explosives	EPA 8330/8321-A	Amber Glass/Teflon Lined Cap	4°C	14 Days	Collect sample ONLY if field screening is positive for HE.
PCBs	EPA 8082	250 mL Glass Jar	4°C	14 Days	Collect sample ONLY if the soil is stained, greasy, discolored or in contact with PCB contaminated items (i.e., transformers, light ballasts).

Parameter	Method No.	Container	Preservative	Hold Time	Rationale
Dioxins/Furans	EPA 1613B	250 mL Glass Jar	4°C	30 Days	Collect sample ONLY if the soil was collected from an area where a fire occurred during excavation and/or a historical fire is evident.
Total petroleum hydrocarbon (TPH)-GRO/DRO	EPA 8015-M	4 x 40mL Glass Vial	4°C, 2 Vials Na HSO4, 1 Vial CH3OH, 1 Vial None	14 Days	Collect sample ONLY if the soil is stained, greasy, or discolored.

6. Prior to sampling, IH and RCT personnel will evaluate the safety conditions in the enclosure and allow entry of personnel for the collection of samples.
7. A representative composite sample of material from each IP-1 will be collected into a single 5-gallon bucket using SOP-06.10, *Hand Auger and Thin-Wall Tube Sampler* or SOP-06.09, *Spade and Scoop Method for Collection of Soil Samples.* One bucket/composite sample for a given lot of containers (e.g., by drift, containing similar waste materials) up to 6 IP-1s (96 - 168 yd^3) will be collected.
8. Soil, if any, that has been set aside or containerized for biased sampling will be collected into a separate 5-gallon bucket using SOP-06.10, *Hand Auger and Thin-Wall Tube Sampler* or SOP-06.09, *Spade and Scoop Method for Collection of Soil Samples.*
9. An RCT will evaluate the 5-gallon bucket(s) for release from the enclosure and the bucket(s) will be passed to sampling personnel outside the enclosure.
10. Sampling personnel will collect the sample suites and QC samples as specified by this SAP, SOP-5059, *Field Quality Control Samples*, and SOP-5056, *Sample Containers and Preservation.*
11. Sampling personnel will complete the appropriate sample documentation and label the sample containers in accordance with SOP-5058, *Sample Control and Field Documentation.*
12. Sampling personnel will decontaminate sampling equipment between samples in accordance with SOP-5061, *Field Decontamination of Equipment.*
13. Sampling personnel will package the samples in accordance with SOP-5057, *Handling, Packaging, and Transporting Field Samples.*
14. An RCT will screen the samples and transportation containers for radiological contamination prior to their transport to the Sample Management Office (SMO).
15. Sampling personnel will transport the samples to the SMO or laboratory in accordance with SOP-5057, *Handling, Packaging, and Transporting Field Samples.*
16. Excess material, if any, in the bucket(s) will be handed back to the excavation personnel in the enclosure and placed back into the appropriate containers.
17. Containers will be closed by waste management personnel, screened for release from the enclosure by the RCTs, and moved to a temporary accumulation area pending analytical results.

ATTACHMENT C

POROUS DEBRIS/ASBESTOS CONTAINING MATERIAL/LAB DEBRIS

C.1 MATERIAL DESCRIPTION

Debris materials from the excavation of MDA-B consists of wood, metal, concrete, asphalt, wall material, ceiling, roofing, stucco, wiring, insulation, window caulking, tiles, siding, woven material, paper, plastic, cardboard, gloves, leaded gloves, booties, wipes, swipes, laboratory coats, beakers, pipettes, and rubber hoses. These materials will typically be separated from the bulk soil and segregated by visual inspection into the following waste streams:

- Porous C&D Debris (e.g., concrete, asphalt, roofing material, wood, cardboard, paper)
- Asbestos Containing Material (e.g., wiring, insulation, linoleum tile, woven material)
- Laboratory Debris (e.g., gloves, leaded gloves, booties, wipes, swipes, laboratory coats, beakers, pipettes, and rubber hoses)

C.2 OBJECTIVE

The purpose of this attachment is to ensure that representative samples are collected from debris waste to support waste characterization and disposal.

C.3 PROCEDURES

- SOP-5194, *Chip Sampling of Porous Surfaces*
- SOP-5056, *Sample Containers and Preservation*
- SOP-5057, *Handling, Packaging, and Transporting Field Samples*
- SOP-5058, *Sample Control and Field Documentation*
- SOP-5059, *Field Quality Control Samples*
- SOP-5061, *Field Decontamination of Equipment*

C.4 EQUIPMENT

- 5-gallon bucket (plastic or metal)
- Gloves (nitrile or latex)
- Trowels/Shovels
- Hammer & Chisel; Drill; and/or Hole Saw
- Sissors and/or Utility Knife
- Dry Decontamination Materials (paper towels, Fantastik®)
- Sample Labels, Container Labels, and Tamper Seals
- Logbook
- Pen and Permanent Marker
- Chain-of-Custody (COC) Form/Request for Analysis Form(s)
- Sample containers and preservatives as specified in Table C.1.

C.5 PRECAUTIONS AND LIMITATIONS

- A minimum of two persons are required to perform sampling activities for safety during sampling activities.
- Sampling personnel must not eat, drink, smoke, apply lip balm, chew tobacco, or gum while sampling or while in the work area.
- The person(s) collecting samples and filling sample containers must change gloves between samples.
- Sampling personnel must dispose of used, disposable equipment and gloves; used ampules and wipes; contaminated containers; and any other waste generated during sampling operations in the appropriate waste container on site.
- When adding preservatives or other solutions (e.g., acids, bases, or water) to materials being sampled, dangerous chemical reactions might occur.

C.6 DATA QUALITY OBJECTIVES

The data quality objectives for materials/media sampled using this attachment are provided in Section 6.0 of this SAP.

C.7 PREREQUISITES

- IH and RCT personnel have confirmed that the contaminated does not present a hazard to sampling personnel (i.e., high radiological, IDLH, Corrosive).
- Sampling conditions are within the specifications of the associated IWD.

C.8 SAMPLING RATIONALE/FREQUENCY

The frequency and rationale for sampling of porous debris, suspect ACM and/or laboratory debris will be determined based upon the various WACs for the disposal facilities, the consistency/location of the waste as it is excavated, and IH/RCT instrument readings as the waste is raked, screened, and/or sifted from the surrounding bulk soil, as applicable. The samples will at a minimum be analyzed for the following:

- Radionuclides (by alpha and gamma spectroscopy)
- Isotopic plutonium, uranium, americium, and tritium.

If the debris is stained with oil or grease the analysis will also include:

- PCB
- TCLP Metals
- VOC
- SVOC

Debris that is suspected to be ACM or ACM contaminated will also be analyzed for asbestos. Table C.1 provides the analytical methods and identifies the containers, preservatives, hold times, and rationale that are applicable to each.

Table C.1 – Methods, Containers, Preservatives, and Hold Times

Parameter	Method No.	Container	Preservative	Hold Time	Rationale [a]
TCLP Metals: As, Ba, Cd, Cr, Pb, Hg, Se, Ag,	EPA 1311/6010-B	250 mL Glass Jar	None	180 Days	Required ONLY if debris is stained with oil or grease.
Volatile Organic Compounds	EPA 8260-B	4 X 40 mL Glass Vial	4°C, 2 Vials Na HSO4, 1 Vial CH3OH, 1 Vial None	14 Days	Required ONLY if debris is stained with oil or grease.
Semi-volatile Organic Compounds	EPA 8270-C	500 mL Glass Jar	4°C	14 Days	Required ONLY if debris is stained with oil or grease.
Asbestos	EPA -600/M4	500 mL Glass Jar	None	None	Required ONLY if debris is suspected to be asbestos.
PCBs	EPA 8082	250 mL Glass Jar	4°C	14 Days	Required ONLY if debris is stained with oil or grease.
Tritium (liquid scintillation)	EPA 906.0	1 L Glass Jar	None	180 Days	Required to meet WAC for disposal facilities.
Gamma spectroscopy	EPA 901.1	1 L Glass Jar	None	180 Days	Required to meet WAC for disposal facilities.
Isotopic Plutonium, Uranium, Americium-241	HASL-300				
Total Uranium	EPA 6020				
Strontium-90	EPA 905				

Debris with a composition that is known to be hazardous (e.g., leaded gloves, asbestos insulation) do not have to be sampled to be characterized as hazardous/ACM but may require sampling for radiological composition to meet the WAC of the treatment and/or disposal facility.

C.9 METHODOLOGY

Representative samples will be collected from the debris as follows:

1. The excavator will dump a bucket of excavated material on the edge of the trench and run its tines through it to segregate debris waste from the soil. The excavator may also use a screen to segregate larger waste debris items from the soil. Segregation of the debris will typically be performed visually using cameras and the excavator to containerize the material.

2. If the camera operator identifies a potential TRU waste item, the excavation will be halted so that this item can be characterized and handled immediately. Potential TRU items include:
    - Glove Boxes
    - 1 gallon metal cans
    - Furnaces
    - Lead Bricks
    - Machining Equipment
    - Items that set off CAM alarms and/or give high radiation readings.
    - Residues in plastic/metal containers
    - Unknown liquids
3. If the camera operator does not identify any TRU waste items, the debris will be segregated into rough waste types (i.e., suspect ACM, concrete, roofing material).
4. The IH and RCT personnel will evaluate all excavated material for high radiological content, IDLH, and other key remote monitoring criteria using instrumentation located inside the enclosure and on the excavator.
5. Debris that is stained/discolored and/or is associated with readings from IH monitoring instrumentation that indicates elevated VOCs/SVOCs will be segregated (i.e., set aside, separate container) by the excavator for biased sampling.
6. The excavator will set aside portions of the debris (small stockpile) as the waste containers are filled for composite sampling.
7. Prior to sampling, IH and RCT personnel will evaluate the safety conditions in the enclosure and allow entry of personnel for the collection of samples.
8. A representative composite sample (e.g., chunks of cement, pieces of PPE, pieces of suspect ACM) from each IP-1 will be collected into 5-gallon buckets using. One bucket/composite sample for a given lot of containers (e.g., by drift, containing similar waste materials) up to 6 IP-1s (96 - 168 yd^3) will be collected.
9. Debris, if any, that has been set aside or containerized for biased sampling will be collected into a separate 5-gallon buckets.
10. An RCT will evaluate the 5-gallon bucket(s) for release from the enclosure and the bucket(s) will be passed to sampling personnel outside the enclosure.
11. Sampling personnel will collect the sample suites and QC samples as specified by this SAP, SOP-5194, *Chip Sampling of Porous Surfaces*, SOP-5059, *Field Quality Control Samples*, and SOP-5056, *Sample Containers and Preservation.*
12. Sampling personnel will complete the appropriate sample documentation and label the sample containers in accordance with SOP-5058, *Sample Control and Field Documentation.*

13. The waste containers will also be labeled by waste management personnel in the enclosure to ensure that the sampled can be linked back to a set or containers or a specific container.
14. Sampling personnel will decontaminate sampling equipment between samples in accordance with SOP-5061, *Field Decontamination of Equipment.*
15. Sampling personnel will package the samples in accordance with SOP-5057, *Handling, Packaging, and Transporting Field Samples.*
16. An RCT will screen the samples and transportation containers for radiological contamination prior to their transport to the Sample Management Office (SMO).
17. Sampling personnel will transport the samples to the SMO or laboratory in accordance with SOP-5057, *Handling, Packaging, and Transporting Field Samples.*
18. Excess material, if any, in the bucket(s) will be handed back to the excavation personnel in the enclosure and placed back into the appropriate containers.
19. Containers will be closed by waste management personnel, screened for release from the enclosure by the RCTs, and moved to a temporary accumulation area inside the AOC pending analytical results.

ATTACHMENT D

NON-POROUS DEBRIS

D.1 MATERIAL DESCRIPTION

Non-porous debris and equipment excavated from MDA-B will typically be separated from the bulk soil (raked, screened, sifted) and segregated by visual inspection into containers as the following waste streams:

- Equipment (e.g., ductwork, hoods, fans, pumps, scales, gloveboxes)
- PCB Contaminated Debris/Equipment (capacitors, transformers, ballasts)
- Mercury Contaminated Equipment (fluorescent light tubes, incandescent light bulbs, thermostats, switches, pumps, thermometers)
- Batteries

D.2 OBJECTIVE

The purpose of this attachment is to ensure that representative samples are collected to support waste characterization and disposal.

D.3 PROCEDURES

- NIOSH Method 7102
- NIOSH Method 9100
- ASTM and EPA 8082
- SOP-5056, *Sample Containers and Preservation*
- SOP-5057, *Handling, Packaging, and Transporting Field Samples*
- SOP-5058, *Sample Control and Field Documentation*
- SOP-5059, *Field Quality Control Samples*
- SOP-5061, *Field Decontamination of Equipment*

D.4 EQUIPMENT

- Sterile gauze/wipes
- Drill; and/or Hole Saw
- Sissors and/or Utility Knife
- 100 cm^2 templates
- Gloves (nitrile or latex)
- Dry Decontamination Materials
- Sample Labels, Container Labels, and Tamper Seals
- Logbook
- Pen and Permanent Marker
- Chain-of-Custody (COC) Form/Request for Analysis Form(s)
- Sample containers and preservatives as specified in Table D.1.

D.5 PRECAUTIONS AND LIMITATIONS

- A minimum of two persons are required to perform sampling activities for safety during sampling activities.
- Sampling personnel must not eat, drink, smoke, apply lip balm, chew tobacco, or gum while sampling or while in the work area.
- The person(s) collecting samples and filling sample containers must change gloves between samples.
- Sampling personnel must dispose of used, disposable equipment and gloves; used ampules and wipes; contaminated containers; and any other waste generated during sampling operations in the appropriate waste container on site.
- When adding preservatives or other solutions (e.g., acids, bases, or water) to materials being sampled, dangerous chemical reactions might occur.

D.6 DATA QUALITY OBJECTIVES

The data quality objectives for materials/media sampled using this attachment are provided in Section 6.0 of this SAP.

D.7 PREREQUISITES

- IH and RCT personnel have confirmed that the contaminated does not present a hazard to sampling personnel (i.e., high radiological, IDLH, Corrosive).
- Sampling conditions are within the specifications of the associated IWD.

D.8 SAMPLING RATIONALE/FREQUENCY

The nonporous debris that is excavated from MDA-B will typically fall into three categories:

1. **Acceptable Knowledge (AK) Identifiable Non-Porous Debris** – This category of non-porous debris will consist of things that can be identified either via the remote camera during excavation or during hand sorting by waste management personnel. It includes structural steel, rebar, batteries, light bulbs, switches, thermometers, and other items with a known chemical/hazardous composition. These items will need to be characterized for radiological contamination ONLY either by sampling or by RCT personnel in accordance with the WCSF.
2. **Unknown Contaminant Non-Porous Debris** – This category of non-porous debris will consist of items/things that cannot be visually, either by camera or hand sorting, characterized. It includes fume hoods, pumps, tanks, piping, ductwork, and glove boxes. This category may also include potential TRU items and equipment containing unknown liquids. The visual AK and the historical documentation for disposal operations at MDA-B are insufficient to make a waste determination for these items so they will be sampled to determine both the chemical and radiological contamination for waste disposal. Sampling may consist of wipe samples, alpha, beta, gamma spectroscopy, radiological swipes, surveys, and/or core sampling as determined by the WMC and the ENV-RCRA Representative.

3. **Equipment Containing Liquid, Residue, Sludge, and/or Solids –** This category of non-porous debris will consist of items that are found to contain liquids (aqueous or otherwise). It includes tanks, piping, and pumps. The AK for both the equipment service and visual examination is not sufficient to make a waste determination so the equipment/item that the liquid came from will be characterized based upon the analytical results of the liquid.

Non-porous debris items will, typically, be wrapped in plastic and moved out of the excavation enclosure to the Definitive Identification Facility (DIF) for characterization sampling. There are two exceptions. The first exception is for oversized items that require size reduction to package. These items will be sampled inside the enclosure under a Site/Item-Specific IWD that addresses the hazards. The second exception is for items that are suspected or known to be TRU or MTRU. These items will be characterized and packaged under a recovery plan. Table D.1 provides the analytical methods and identifies the containers, preservatives, hold times, and rationale for non-porous debris waste.

Table D.1 – Methods, Containers, Preservatives, and Hold Times – Non-porous Debris

Parameter	Method No.	Container	Preservative	Hold Time	Rationale [a]
CORE SAMPLES					
Total Metals: Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Ti, V, Zn	EPA 6010-B	250 mL Glass Jar	None	180 Days	To meet WAC for disposal facilities.
Total Metals: Hg	EPA 7471A	250 mL Glass Jar	4°C	28 Days	To meet WAC for disposal facilities.
TCLP Metals: As, Ba, Cd, Cr, Pb, Hg, Se, Ag,	EPA 1311/6010-B	250 mL Glass Jar	None		Collect the sample and archive. If the Totals are close to 20 times rule limits send the sample for analysis.
Volatile Organic Compounds	EPA 8260-B	4 X 40 mL Glass Vial	4°C, 2 Vials Na HSO4, 1 Vial CH3OH, 1 Vial None	14 Days	To meet WAC for disposal facilities.
Semi-volatile Organic Compounds	EPA 8270-C	250 mL Glass Jar	4°C	14 Days	To meet WAC for disposal facilities.
PCBs	EPA 8082	250 mL Glass Jar	4°C	14 Days	To meet WAC for disposal facilities.
Tritium (liquid scintillation)	EPA 906.0	1 L Glass Jar	None	180 Days	To meet WAC for disposal facilities.
Gamma spectroscopy	EPA 901.1	1 L Glass Jar	None	180 Days	To meet WAC for disposal facilities.
Isotopic plutonium, americium, uranium	HASL-300				
Strontium-90	EPA 905				
Americium-241	HASL-300				
WIPE SAMPLES					
Metals: Pb, Be, As, Cd, Cr, Ni	NIOSH 9100 & EPA 6010-B	Cotton Gauze Pads, 100 cm^2, 250 mL Glass Jar	DI water, Isopropyl Alcohol, ethanol, methanol, or hexane	180 Days	Collect to determine presence ONLY.
Organics	NIOSH 9100 & EPA 8260-B	Cotton Gauze Pads, 100 cm^2, 250 mL Glass Jar	Isopropyl Alcohol	14 Days	Collect to determine presence ONLY.
PCBs	ASTM & EPA 8082	Cotton Gauze Pads, 100 cm^2, 250 mL Glass Jar	Hexane or Isooctane	14 Days	Collect to determine presence ONLY.

D.9 METHODOLOGY

Representative samples will be collected from the debris as follows:

1. The excavator will dump a bucket of excavated material on the edge of the trench and run its tines through it to segregate debris waste from the soil. The excavator may also use a screen to segregate larger waste debris items from the soil. Segregation of the debris will typically be performed visually using cameras and the excavator to containerize the material.
2. If the camera operator identifies a potential TRU waste item, the excavation will be halted so that this item can be characterized and handled immediately under a recovery plan. Potential TRU items include:

    - Glove Boxes
    - 1 gallon metal cans
    - Furnaces
    - Lead Bricks
    - Machining Equipment
    - Items that set off CAM alarms and/or give high radiation readings.

3. If the camera operator does not identify any TRU waste items, the IH and RCT personnel will evaluate all excavated material for high radiological content, IDLH, and other key remote monitoring criteria using instrumentation located inside the enclosure and on the excavator.
4. The debris will be segregated into waste types (i.e., structural steel, suspect PCB, transformers.). This may be performed by the excavator or by hand sorting.
5. Debris that is stained/discolored and/or is associated with readings from IH monitoring instrumentation that indicates elevated VOCs/SVOCs will be segregated (i.e., set aside, separate container) by the excavator for biased sampling.
6. The debris will either be containerized into IP-1 roll off boxes (16 -18 yd^3), wrapped in plastic for characterization sampling at the DIF, or sampled inside the enclosure prior to size reduction and packaging.
7. Excavation will be halted when there is no longer room to segregate and package waste inside the enclosure.
8. IH and RCT personnel will evaluate the safety conditions in the enclosure and allow entry of waste management or sampling personnel for the collection of samples.
9. Sampling personnel will collect wipe samples (from items identified by the WMC) using NIOSH Method 9100 procedure for lead and/or the NIOSH Method 7102 for Beryllium. PCB wipes will be collected using the ASTM procedure.

10. Sampling personnel will collect core samples (from items identified by the WMC) using SOP-5194, *Chip Sampling of Porous Surfaces*, SOP-5059, *Field Quality Control Samples* or an item specific IWD and SOP-5056, *Sample Containers and Preservation.*
11. Sampling personnel will complete the appropriate sample documentation and label the sample containers in accordance with SOP-5058, *Sample Control and Field Documentation.*
12. The waste containers will also be labeled by waste management personnel in the enclosure to ensure that the sampled can be linked back to a set or containers or a specific container.
13. Sampling personnel will decontaminate sampling equipment between samples in accordance with SOP-5061, *Field Decontamination of Equipment.*
14. Sampling personnel will package the samples in accordance with SOP-5057, *Handling, Packaging, and Transporting Field Samples.*
15. An RCT will screen the samples and transportation containers for radiological contamination prior to their transport to the Sample Management Office (SMO).
16. Sampling personnel will transport the samples to the SMO or laboratory in accordance with SOP-5057, *Handling, Packaging, and Transporting Field Samples.*
17. Excess material, if any, in the bucket(s) will be handed back to the excavation personnel in the enclosure and placed back into the appropriate containers.
18. Containers will be closed by waste management personnel, screened for release from the enclosure by the RCTs, and moved to a temporary accumulation area inside the AOC pending analytical results.

ATTACHMENT E

AQUEOUS LIQUIDS

E.1 MATERIAL DESCRIPTION

Aqueous liquids consist of water/water based solutions that have come into contact with potentially contaminated soil due to excavation operations at MDA-B. This includes the following:

- Liquids generated due to the decontamination of excavation, waste handling, and/or sampling equipment.
- Liquids generated due to decontamination contaminated personnel.
- Storm-water run-on/runoff collected within enclosures, retention/detention basins, and/or excavations.
- Dust suppression water (e.g., CaCl solution) that has spilled or has collected into pools, retention/detention basins, and/or excavations.

These liquids may be stored, collected, and/or found in retention/detention basins, secondary containment areas, drums, and/or various sized tanks at MDA-B.

E.2 OBJECTIVE

The purpose of this attachment is to ensure that representative samples are collected from aqueous liquids. The analytical data obtained from these samples will be used to support characterization and disposal at either the TA-50 Radioactive Liquid Waste Treatment facility (RLWTF) or the TA-46 Sanitary Waste Water System (SWWS), as appropriate.

E.3 PROCEDURES

- SOP-06.15, *COLIWASA Sampler for Liquids and Slurries.*
- SOP-06.19, *Weighted Bottle Sampler for Liquids and Slurries in Tanks*
- SOP-5056, *Sample Containers and Preservation*
- SOP-5057, *Handling, Packaging, and Transporting Field Samples*
- SOP-5058, *Sample Control and Field Documentation*
- SOP-5059, *Field Quality Control Samples*
- SOP-5061, *Field Decontamination of Equipment*

E.4 EQUIPMENT

- COLIWASA (plastic or glass) – Used to sample containers < 5-ft deep.
- Weighted Bottle Sampler (plastic or glass) – Used to sample storage tanks, wells, sumps, and containers > 5-ft deep.
- Gloves (nitrile or latex)
- Dry Decontamination Materials
- Sample Labels, Container Labels, and Tamper Seals
- Logbook
- Pen and Permanent Marker
- Chain-of-Custody (COC) Form/Request for Analysis Form(s)
- Sample containers and preservatives as specified in Table E.1.

E.5 PRECAUTIONS AND LIMITATIONS

- A minimum of two persons are required to perform sampling for safety during sampling activities.
- Sampling personnel must not eat, drink, smoke, apply lip balm, chew tobacco, or gum while sampling or while in the work area.
- The person(s) collecting samples and filling sample containers must change gloves between samples.
- Sampling personnel must dispose of used, disposable equipment and gloves; used ampules and wipes; contaminated containers; and any other waste generated during sampling operations in the appropriate waste container on site.
- When adding preservatives or other solutions (e.g., acids, bases, or water) to materials being sampled, dangerous chemical reactions might occur.

E.6 DATA QUALITY OBJECTIVES

E.6.1 Problem Definition

The contaminant composition of aqueous liquids that have come into contact with potentially contaminated soils at MDA-B is unknown. This material must be characterized to support compliance with the Waste Acceptance Criteria for disposal at either the TA-50 RLWTF or the TA-46 SWWS, as appropriate.

E.6.2 Decision Statement

The following Principal Study Question (PSQ), Alternative Actions (AA), and decision statement (DS) are associated with sampling of aqueous liquids:

PSQ: What is the contaminant composition of aqueous liquids that have come into contact with potentially contaminated soils at MDA-B?

AA1: Aqueous liquids that meet the WAC for the RLWTF will be shipped to TA-50 for treatment and disposal as radioactive liquid LLW.

AA2: Aqueous liquids that meet the WAC for the SWWS will be shipped to TA-46 for treatment and disposal as sanitary waste.

AA3: Aqueous liquids that do not meet the WAC for the RLWTF or the SWWS will be adsorbed and disposed of as Hazardous, MLLW, or LLW waste based upon the contaminant composition.

DS: Aqueous liquids will be disposed of as radioactive liquid LLW, liquid sanitary waste or as solid Hazardous, MLLW, or LLW based upon the contaminant composition.

E.6.3 Decision Inputs

The following decision inputs are applicable:

DI1: Representative samples analyzed for a minimum of Total/TAL metals; radionuclides (by alpha and gamma spectroscopy); isotopic uranium, plutonium, americium, tritium, strontium-90; volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), PCBs, Pesticides/Herbicides, perchlorate, nitrate/nitrite, total cyanide, Total Petroleum Hydrocarbon (TPH), Total Suspended Solids (TSS)/Total Dissolved Solids (TDS), and Chemical Oxygen Demand (COD).

DI2: Representative samples analyzed for Oil and Grease, Microtox, and Total Nitrogen/Total Phosphorous if the waste is destined for disposal at SWWS.

DI3: Results from characteristic tests to determine reactivity, ignitability, and corrosivity (i.e., pH).

The action levels (AL) are:

AL1: The RLWTF WAC provided in P930-1, Attachment 1.

AL2: The SWWS WAC provided in P930-1, Attachment 16.

AL3: Regulatory threshold concentrations as specified by RCRA in 40 CFR 261.24.

AL4: Characteristic properties (ignitability, corrosivity, and reactivity) as specified by RCRA in 40 CFR 261.21 – 23.

E.6.4 Decision Rules

Decision rules (DRs) are specified to define the parameter(s) that characterize the population of interest. The following summarizes the parameters of interest for the PSQ and defines the decision pathway once they are characterized.

DR1: IF the analytical results indicate that the aqueous liquid meets the SWWS WAC THEN the material will be disposed as sanitary waste.

DR2: IF the analytical results indicate that the aqueous liquid meets the WAC for the RLWTF THEN the material will be disposed as radioactive liquid LLW.

DR3: IF the analytical results indicated that the aqueous liquids does not meet the WAC for the RLWTF or the SWWS THEN the material will be adsorbed and disposed of as Hazardous, MLLW, or LLW at an approved federal or commercial Treatment, Storage, and Disposal Facility..

E.7 PREREQUISITES

- IH and RCT personnel have confirmed that the aqueous liquid does not present a hazard to sampling personnel (i.e., high radiological, IDLH, Corrosive).
- Sampling conditions are within the specifications of the associated IWD.
- Aqueous liquids may be sampled at its temporary storage location, inside the DIF, and/or at the point of generation.

E.8 SAMPLING RATIONALE/FREQUENCY

The frequency and rationale for sampling of aqueous liquids is determined by P930-1, *LANL Waste Acceptance Criteria* (WAC) for the Radioactive Liquid Waste Treatment Facility (RLWTF) and the Sanitary Waste Water System (SWWS), and the location of the soil that it was in contact with. All aqueous samples will at a minimum be sampled and analyzed for the following:

- pH
- Total/TAL metals
- Radionuclides (by alpha and gamma spectroscopy); isotopic uranium, plutonium, americium, tritium, and strontium-90
- Total Toxic Organics (TTO) (Volatile organic compounds [VOCs] and Semi-volatile organic compounds [SVOCs])
- Pesticides/Herbicides/PCBs
- Perchlorate,
- Nitrate/Nitrite
- Total Cyanide
- Total Petroleum Hydrocarbon (TPH)
- Total Suspended Solids (TSS)/Total Dissolved Solids (TDS)
- Chemical Oxygen Demand (COD)

If the aqueous liquid will be disposed of at the SWWS the following additional samples must be collected and analyzed:

- Oil and Grease
- Microtox
- Total Nitrogen/Total Phosphorous

Table E.1 provides the analytical methods and identifies the containers, preservatives, hold times, and rationale that are applicable to each.

E.9 METHODOLOGY

E.9.1 Containers/Drums/Buckets

Aqueous liquids that have been collected into containers (i.e., 5-gallon buckets, 55-gallon drums, tanks < 5-feet deep) will be sampled as follows:

1. Inspect the container/drum/bucket to identify any leaks, damage, or indications that it is under pressure (i.e., bulging). Contact the TA-21 Operations if any of the above criteria are observed.
2. If the container/drum/bucket is acceptable for sampling, the waste management personnel will open the container by removing the lid and/or bung hole, as applicable.
3. The IH and RCT will then evaluate the open container to ensure that it is safe to approach for sampling.

Table E.1 – Methods, Containers, Preservatives, and Hold Times – Aqueous Liquids

Parameter	Method No.	Container	Preservative	Hold Time	Rationale [a,b]
Total Metals: Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Ti, V, Zn	EPA 200.7 and 200.8	500 mL Plastic	HNO3, pH <2	180 Days	Required by RLWTF and SWWS WAC
Total Metals: Hg	EPA 245.1	500 mL Plastic	HNO3 pH <2	28 Days	
Total Cyanide	EPA 335.1 and 335.3	1 L Plastic	4°C, NaOH, pH >12	14 Days	Required by RLWTF and SWWS WAC
Perchlorate	EPA 314.0, 9058	250 ML Plastic or Glass	4°C	28 Days	Required by RLWTF and SWWS WAC
TTO - Volatile Organic Compounds (VOC)	EPA 8260B	3X40 mL Glass Vial	4°C, HCl, pH <2	14 Days	Required by RLWTF and SWWS WAC
TTO - Semi-Volatile Organic Compounds	EPA 8270C	4 L Amber Glass	4°C	7 Days	Required by RLWTF and SWWS WAC
Organic Pesticides, PCBs, Organic Herbicides	EPA 8081A, 8082 and 8151A	4 L Amber	4°C	7 Days	Required by RLWTF and SWWS WAC
Total petroleum hydrocarbon (TPH)-GRO/DRO	EPA 1664	1 L Amber Glass	4°C, H2SO4 or HCl, pH<2	28 Days	Required by RLWTF and SWWS WAC
Tritium (liquid scintillation)	EPA 906.0	1L Glass	None	180 Days	Required by RLWTF and SWWS WAC
Gamma spectroscopy	EPA 901.1	1 L Plastic (2x2 L Preferred)	HNO3, pH<2	180 Days	Required by RLWTF and SWWS WAC
Isotopic plutonium	HASL-300				
Isotopic uranium	HASL-300				
Total uranium	EPA 6020				
Strontium-90	EPA 905				
Americium-241	HASL-300				

Table E.1 – Methods, Containers, Preservatives, and Hold Times – Aqueous Liquids (continued)

Parameter	Method No.	Container	Preservative	Hold Time	Rationale
Total Suspended Solids (TSS) and Total Dissolved Solids (TDS)	EPA 160.1	1 L Plastic	4°C	7 Days	Required by RLWTF and SWWS WAC
pH	EPA 904c	125 mL Plastic	4°C	24 Hours	Required by RLWTF and SWWS WAC
Chemical Oxygen Demand (COD)	EPA 410.4	250 mL Glass	4°C, H2SO4, pH<2	28 Days	Required by RLWTF and SWWS WAC
Nitrate/Nitrite	EPA 343.2	1 L Plastic	4°C, 1M Boric Acid	48 Hours	Required by RLWTF WAC
Oil and Grease	EPA 1664 or 9070/9071	1 L Glass	4°C, H2SO4, or HCl, pH <2	28 Days	Required by SWWS WAC
Microtox	SM 8050	1 L Glass	4°C	24 Hours	Required by SWWS WAC
Total Nitrogen/Total Phosphorous	EPA 365.4 and 350	1 L Plastic	4°C; H2SO4; pH <2	28 Days	Required by SWWS WAC

a. RLWTF WAC is located in P930-1, Attachment 1.
b. SWWS WAC is located in P930-1, Attachment 16.

4. Sample personnel will collect the sample suit (see Table E.2) from the container using SOP-06.15, *COLIWASA Sampler for Liquids and Slurries*. One sample suit per container is required.
5. Sampling personnel will collect the sample suites and QC samples as specified by this SAP, SOP-5059, *Field Quality Control Samples*, and SOP-5056, *Sample Containers and Preservation.*
6. Sampling personnel will complete the appropriate sample documentation and label the sample containers in accordance with SOP-5058, *Sample Control and Field Documentation.*
7. Sampling personnel will decontaminate sampling equipment between samples in accordance with SOP-5061, *Field Decontamination of Equipment* or will use disposable sampling equipment.
8. Sampling personnel will package the samples in accordance with SOP-5057, *Handling, Packaging, and Transporting Field Samples.*
9. An RCT will screen the samples and transportation containers for radiological contamination prior to their transport to the Sample Management Office (SMO).
10. Sampling personnel will transport the samples to the SMO or laboratory in accordance with SOP-5057, *Handling, Packaging, and Transporting Field Samples.*
11. The container(s) sampled will be closed by waste management personnel and (if removed) returned to a temporary accumulation area inside the AOC pending analytical results.

E.9.2 Tanks

Aqueous liquids that have been collected into tanks >5-ft deep will be sampled as follows:

1. Inspect the tank to identify any leaks, damage, or indications that it is under pressure (i.e., bulging). Contact the TA-21 Operations if any of the above criteria are observed.
2. If the tank is acceptable for sampling, waste management personnel will open the vessel.
3. The IH and RCT will then evaluate the open vessel to ensure that it is safe to approach for sampling.
4. Sample personnel will collect the sample suit (see Table E.2) from the container using SOP-06.19, Weighted Bottle Sampler for *Liquids and Slurries in Tanks*. A minimum of one sample suit per container is required.
5. Sampling personnel will collect the sample suites and QC samples as specified by this SAP, SOP-5059, *Field Quality Control Samples*, and SOP-5056, *Sample Containers and Preservation.*
6. Sampling personnel will complete the appropriate sample documentation and label the sample containers in accordance with SOP-5058, *Sample Control and Field Documentation.*

7. Sampling personnel will decontaminate sampling equipment between samples in accordance with SOP-5061, *Field Decontamination of Equipment* or will use disposable sampling equipment.
8. Sampling personnel will package the samples in accordance with SOP-5057, *Handling, Packaging, and Transporting Field Samples.*
9. An RCT will screen the samples and transportation containers for radiological contamination prior to their transport to the SMO.
10. Sampling personnel will transport the samples to the SMO or laboratory in accordance with SOP-5057, *Handling, Packaging, and Transporting Field Samples.*
11. The tank sampled will be closed by waste management personnel and (if removed) returned to a temporary storage area inside the AOC pending analytical results.

E.9.3 Detention/Retention Basins

Aqueous liquids that have collect in detention/retention basins and/or the excavations, if collected into containers, will be sampled as described in Section E.9.1.

ATTACHMENT F

CONFIRMATION SAMPLES FROM THE TRENCH BOTTOM AND SIDEWALLS

F.1 MATERIAL DESCRIPTION

Post excavation confirmation sampling will consist of tuff and/or soil samples collected from the excavated waste trench/cell floor and sidewalls after all waste contents have been removed.

F.2 OBJECTIVE

The purpose of this attachment is to ensure that representative samples are collected from the excavated trench bottoms and two sidewalls. The analytical data obtained from these samples will be evaluated to determine the following:

- Confirmation that residential SSLs and SALs have been achieved in the excavated area.
- Support site backfill and restoration.
- Determine if residual contamination poses any unacceptable risk to human health or the environment.
- Provide a basis for additional site characterization/remediation if the residential SSLs and SALs have NOT been achieved.

The confirmation sampling requirements are specified by LA-UR-06-6918, *EP2006-0783, Investigation/Remediation Work Plan for Material Disposal Area B, Solid Waste Management Unit 21-015, at Technical Area 21, Revision 1.*

F.3 PROCEDURES

- SOP-06.10, *Hand Auger and Thin-Wall Tube Sampler* SOP-06.09, *Spade and Scoop Method for Collection of Soil Samples*
- SOP-06.09, *Spade and Scoop Method for Collection of Soil Samples.*
- SOP-5056, *Sample Containers and Preservation*
- SOP-5057, *Handling, Packaging, and Transporting Field Samples*
- SOP-5058, *Sample Control and Field Documentation*
- SOP-5059, *Field Quality Control Samples*
- SOP-5061, *Field Decontamination of Equipment*

F.4 EQUIPMENT

- 5-gallon bucket
- Gloves (nitrile or latex)
- Trowels/Shovels
- Dry Decontamination Materials
- Sample Labels, Container Labels, and Tamper Seals
- Logbook
- Pen and Permanent Marker
- Chain-of-Custody (COC) Form/Request for Analysis Form(s)
- Sample containers and preservatives as specified in Table F.1.

F.5 PRECAUTIONS AND LIMITATIONS

- A minimum of two persons are required to perform sampling activities for safety during sampling activities.
- Sampling personnel must not eat, drink, smoke, apply lip balm, chew tobacco, or gum while sampling or while in the work area.
- The person(s) collecting samples and filling sample containers must change gloves between samples.
- Sampling personnel must dispose of used, disposable equipment and gloves; used ampules and wipes; contaminated containers; and any other waste generated during sampling operations in the appropriate waste container on site.
- When adding preservatives or other solutions (e.g., acids, bases, or water) to materials being sampled, dangerous chemical reactions might occur.

F.6 DATA QUALITY OBJECTIVES

F.6.1 Problem Definition

The horizontal and vertical extent of contamination in the surrounding soils, sediments, and/or tuff at MDA-B is unknown. After the waste has been removed from the MDA B disposal trenches it is necessary to determine the following:

- Residual contamination, if any, in the disposal trenches has effectively been reduced such that soils, sediments, and/or tuff are below risk-based cleanup goals.
- Areas where contamination remains at concentrations equal to or greater than risk-based cleanup goals are identified for additional investigation and/or risk based anlaysis.

F.6.2 Decision Statement

The following Principal Study Question (PSQ), Alternative Actions (AA), and decision statement (DS) are associated with sampling of overburden/layback:

PSQ: What are the residual contaminants of potential concern (COPCs) in the tuff and/or soil at the bottom and within the sidewalls of the trenches after the waste has been removed from the MDA-B?

AA1: Confirmation samples with residual contamination below residential SSLs and SALs will be used to identify areas that to do NOT require additional excavation or characterization.

AA1: Confirmation samples with residual contamination at concentrations equal to or above the SSLs and SALs will be used to identify areas that require additional investigation, characterization, and/or excavation.

DS1: No further action is required.

DS2: Additional investigation, characterization, and/or excavation may be required for specific areas and/or locations at MDA-B.

F.6.3 Decision Inputs

The following decision inputs are applicable:

DI1: A minimum of 132 confirmation samples collected from the trench bottoms and sidewalls using a random-systematic grid pattern and locations identified by the use of GPS coordinates obtained when the samples are collected.

DI2: Analytical results for each sample that include a minimum of TAL metals, Radionuclides (by alpha, beta, and gamma spectroscopy), isotopic uranium, isotopic plutonium, americium-241, tritium, strontium-90, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), perchlorate, nitrate, cyanide, and pesticides/herbicides

DI3: Soil screening results at each sample location for explosive compounds. Analytical results for explosive compounds from a minimum of 20% of the total samples (26 samples) collected and for any areas where the screening results were positive.

DI4: Analytical results for dioxins/furans from a minimum of 20% of the total number of samples (26 samples to confirm that dioxins/furans are NOT present) collected and for any biased samples collected from areas where a fire has been identified to have occurred either historically or during excavation.

DI5: Analytical results for TPH and PCB from biased samples collected in stained soil.

The action levels (AL) are identified in LA-UR-06-6918, *Investigation/Remediation Work Plan for Material Disposal Area B, Solid Waste Management Unit 21-015, at Technical Area 21, Los Alamos National Laboratory* as follows:

AL1: Residential soil screening levels (SSLs) for chemicals specified by EPA Region 6 and EP2006.1080.

AL2: Residential screening action levels (SALs) for radionuclides in soil specified by DOE 5400.5 and EP2006.1080.

F.6.4 Decision Rules

Decision rules (DRs) are specified to define the parameter(s) that characterize the population of interest. The following summarizes the parameters of interest for the PSQ and defines the decision pathway once they are characterized.

DR1: IF the analytical results indicate COPC levels below residential SSLs and SALs, THEN no further action is required.

DR2: If the analytical results indicate COPC levels at or above residential SSLs and SALs, THEN the results will be used to identify areas/locations at MDA-B where additional investigation, characterization, and/or excavation may be performed.

F.6.5 Decision Error Limits

Decision error limits are specified, whenever possible, to minimize data uncertainty. This is managed by specifying tolerable limits on decision errors that are used to establish performance goals for the sampling design. The comparison of confirmation sample results to residential SSLs and SALs is not statistical in nature, therefore, decision error limits are not applicable.

F.7 PREREQUISITES

- Excavation personnel have confirmed that the overburden/layback to be sampled was not mixed with waste materials from the MDA-B trenches/disposal cells.
- IH and RCT personnel have confirmed that the overburden/layback does not present a hazard to sampling personnel (i.e., high radiological, IDLH, Corrosive).
- Sampling conditions are within the specifications of the associated IWD.

F.8 SAMPLING RATIONALE/FREQUENCY

The frequency and rationale for confirmation sampling is specified by LA-UR-06-6918 Sections 4.10 and 5.5 and consists of the following two scenarios:

- **Radom Sampling:** The random confirmation sampling at MDA-B will consist of a statistically valid number of samples systematically spaced throughout the trenches in both the horizontal and vertical plains based on the MDA B site wide 10-ft coordinate grid (Figure F.1). The approach is based on the random selection of the first three definitive sample locations on the 10-ft grid. From these randomly selected points, the remaining sample locations will be systematically located on 50-ft centers in both the vertical and horizontal directions. Each sample location will be recorded in the sample logbook and identified with GPS coordinates at the time it is collected. The result will be a total of 132 discrete samples collected across the extent of MDA-B.
- **Biased Sampling:** The biased sampling at MDA-B will consist of samples collected at areas where elevated field screening (for VOC, SVOC, and radiological components), visual staining, fractures, and/or areas of elevated moisture are observed. Each biased sample location will be recorded in the sample logbook and identified with GPS coordinates at the time it is collected. It is unknown how many biased sampled will be required at MDA-B.

The excavation of waste at MDA-B will typically occur in panels that are approximately 40 ft long by 20 ft wide by 15 ft deep. Sampling personnel will not be permitted to enter the excavated trench to collect the random and/or biased confirmation samples for safety reasons. The excavator will removed 1 – 2 ft of soil from the sample location and the sample material will be collected from the excavator bucket. The samples will at a minimum be analyzed for the following:

- Total/TAL metals
- Radionuclides (by alpha and gamma spectroscopy), isotopic uranium, isotopic plutonium, tritium, strontium-90
- Volatile organic compounds (VOCs)
- Semi-volatile organic compounds (SVOCs)
- Perchlorate
- Nitrate
- Cyanide
- Pesticides/Herbicides
- High Explosives Field Screening

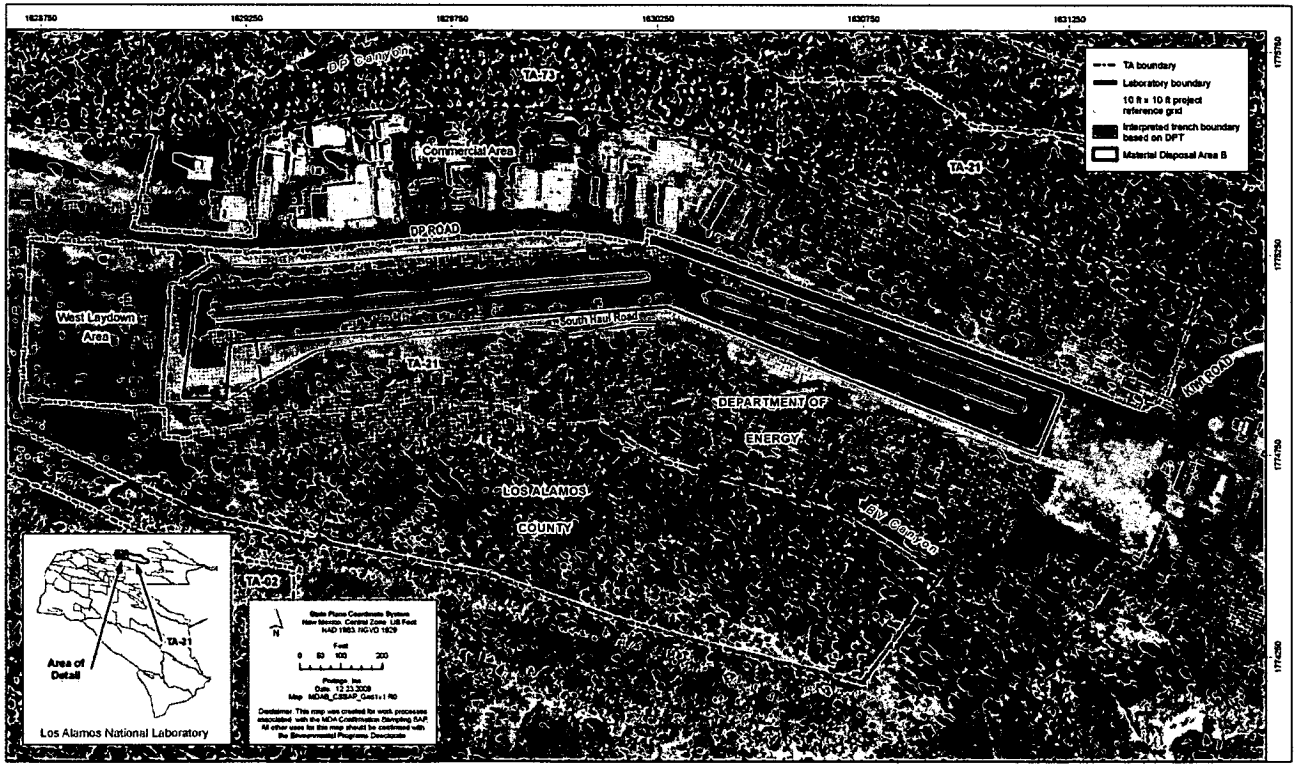

Figure 3 - MDA B Site Wide 10-ft Coordinate Grid

Several other constituents will be analyzed for, as necessary, due to the site conditions and preliminary sample/screening results. This includes the following:

- If the analytical results for TAL metals indicate contaminates near regulated levels, the analysis for TCLP Metals will also be performed.
- Explosive compounds from 20% of the total samples and from any sampled areas where field screening results are positive.
- Analytical results for dioxins/furans from a minimum of 20% of the total number of samples (26 samples) and for any biased samples collected from areas where a fire has been identified to have occurred either historically or during excavation.
- Soil that is observed to have staining will be analyzed for total petroleum hydrocarbons (TPH) and PCBs.

Table F.1 provides the analytical methods and identifies the containers, preservatives, hold times, and rationale that are applicable to each.

Table F.1 – Methods, Containers, Preservatives, and Hold Times

Parameter	Method No.	Container	Preservative	Hold Time	Rationale [a]
Total Metals: Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Ti, V, Zn	EPA 6010-B	250 mL Glass Jar	None	180 Days	Required by LA-UR-06-6918
Total Metals: Hg	EPA 7471A	250 mL Glass Jar	4°C	28 Days	Required by LA-UR-06-6918
TCLP Metals: As, Ba, Cd, Cr, Pb, Hg, Se, Ag,	EPA 1311/6010-B	250 mL Glass Jar	None		Collect the sample and archive. If the Totals are close to 20 times rule limits send the sample for analysis.
Total Cyanide	EPA 9012-A	125 mL Glass Jar	4°C	14 Days	Required by LA-UR-06-6918
Perchlorates	EPA 6850	4 oz Wide-Mouth Jar	4°C	60 Days	Required by LA-UR-06-6918
Nitrates/Nitrites	EPA 300.09	250 mL Glass Jar	4°C	48 Hours	Required by LA-UR-06-6918
Volatile Organic Compounds	EPA 8260-B	4 X 40 mL Glass Vial	4°C, 2 Vials Na HSO4, 1 Vial CH3OH, 1 Vial None	14 Days	Required by LA-UR-06-6918
Semi-volatile Organic Compounds	EPA 8270-C	250 mL Glass Jar	4°C	14 Days	Required by LA-UR-06-6918
Organic Pesticides	EPA 8081-A	250 mL Glass Jar	4°C	14 Days	Required by LA-UR-06-6918
Organic Herbicides	EPA 8151-A	250 mL Glass Jar	4°C	14 Days	Required by LA-UR-06-6918
PCBs	EPA 8082	250 mL Glass Jar	4°C	14 Days	Collect ONLY for samples from stained soil.
High Explosives	EPA 8330/8321-A	Amber Glass/Teflon Lined Cap	4°C	14 Days	Collect for 20% of the total number of samples (26) and if screening results are positive.
Dioxins/Furans	EPA 1613B	250 mL Glass Jar	4°C	30 Days	Collect for 20% of the total number of samples (26) and for biased samples collected from areas known to have had a fire.
Total petroleum hydrocarbon (TPH)-GRO/DRO	EPA 8015-M	4 x 40mL Glass Vial	4°C, 2 Vials Na HSO4, 1 Vial CH3OH, 1 Vial None	14 Days	Collect ONLY for samples from stained soil.

Table F.1 – Methods, Containers, Preservatives, and Hold Times

Parameter	Method No.	Container	Preservative	Hold Time	Rationale
Tritium (liquid scintillation)	EPA 906.0	1 L Glass Jar	None	180 Days	Required by LA-UR-06-6918
Gamma spectroscopy	EPA 901.1	250 mL Glass Jar	None	180 Days	Required by LA-UR-06-6918
Isotopic plutonium	HASL-300				
Isotopic uranium	HASL-300				
Total uranium	EPA 6020				
Strontium-90	EPA 905				
Americium-241	HASL-300				

a. LA-UR-06-6918, *Investigation/Remediation Work Plan for Material Disposal Area B, Solid Waste Management Unit 21-015, at Technical Area 21, Los Alamos National Laboratory.*

F.9 FIELD METHODOLOGY

Representative confirmation samples will be collected as follows:

1. The confirmation sample (both random and biased) interval will be collected from approximately 0–2 ft below ground surface (bgs) as judged by the excavator operator. The sample location will be identified by the Sample Coordinator, it will be located by GPS in the logbook , and then the excavator will collect it.
2. IH and RCT personnel will evaluate the excavated soil for high radiological content, IDLH, and other key remote monitoring criteria.
3. If radioactivity or VOCs are detected at levels three times background or greater, a second (contingency) sample will be collected immediately below the first confirmation sample. The depth interval of the contingency sample will be approximately 2–4 ft bgs as judged by the excavator operator. A contingency sample also will be collected if a specific area of fracturing or staining is noted.
4. IH and RCT personnel will evaluate the safety conditions in the enclosure and allow entry of personnel for the collection of confirmation samples.
5. A representative composite sample of material from the excavator bucket will be collected into a single 5-gallon bucket using SOP-06.09, *Spade and Scoop Method for Collection of Soil Samples.* A separate bucket will be used for contingency samples, if collected.
6. An RCT will evaluate the 5-gallon bucket for release from the enclosure and it will be passed to sampling personnel outside the enclosure.
7. Sampling personnel will collect the sample suites and QC samples as specified by this SAP, SOP-5059, *Field Quality Control Samples*, and SOP-5056, *Sample Containers and Preservation.*
8. Sampling personnel will complete the appropriate sample documentation and label the sample containers in accordance with SOP-5058, *Sample Control and Field Documentation.*
9. Sampling personnel will decontaminate sampling equipment between samples in accordance with SOP-5061, *Field Decontamination of Equipment.*
10. The excavator bucket will also be decontaminated in accordance with SOP-5061, Field Decontamination of Equipment.
11. Sampling personnel will collect the sample suites and QC samples as specified by this SAP, SOP-5059, *Field Quality Control Samples*, and SOP-5056, *Sample Containers and Preservation.*
12. Sampling personnel will complete the appropriate sample documentation and label the sample containers in accordance with SOP-5058, *Sample Control and Field Documentation.*
13. Sampling personnel will decontaminate sampling equipment between samples in

accordance with SOP-5061, *Field Decontamination of Equipment.*

14. Sampling personnel will package the samples in accordance with SOP-5057, *Handling, Packaging, and Transporting Field Samples.*
15. An RCT will screen the samples and transportation containers for radiological contamination prior to their transport to the Sample Management Office (SMO).
16. Sampling personnel will transport the samples to the SMO or laboratory in accordance with SOP-5057, *Handling, Packaging, and Transporting Field Samples.*
17. Excess material, if any, in the bucket will be handed back to the excavation personnel in the enclosure and placed back into the excavation.
18. Containers will be closed by waste management personnel, screened for release from the enclosure by the RCTs, and moved to a temporary storage area inside the AOC pending analytical results.

SAVE PRINT

ATTACHMENT 1: DOCUMENT ACTION REQUEST (DAR) FORM

Document Action Request (DAR) Form

Los Alamos NATIONAL LABORATORY EST 1943

Section #1 – Type of Request

Document Number:	Revision:	Title:
TA21-MDAB-PLAN-00017	0	MDA-B Sampling and Analysis Plan

Requestor Signature:	Print Name:	Phone:	Z Number:	Date:
[signature]	Randy Morgan	665-5446	236297	05/27/2010

Section #2 – Procedure Owner Approval for Processing

☑ New Document ☐ Major Revision ☐ Minor Revision ☐ Deactivation ☐ Cancellation

Periodic Review: 1 Year ☑ 2 Year ☐ 3 Year ☐ 4 Year ☐ 5 Year ☑ Rev 6/15/10

If new document, describe document type: Instructions

Provide a detailed description of the requested change. (Attach additional sheets if needed. Number all additional sheets.):

Purpose of this document is to describe the methods, procedures, frequencies, and rationale for samples collected to support the investigation/remediation and waste management efforts at MDA-B.

☑ Approved ☐ Disapproved (Return to originator) Priority: High

Procedure Owner Signature:	Print Name:	Date:
[signature]	Jeff Erickson	6/15/10

Section #3 – Review and Concurrence

Review and Concurrence: Obtain concurrence from all review organizations. (Enter N/A for not applicable.) Document all additional review organizations, if needed, on a continuation sheet. Cognizant System Engineer Program (CSE) approval is required for all technical procedures except minor revisions, and non-authorization-basis-related cancellations/ deactivations. CSE approval is always required for changes affecting safety-basis steps.

Reviewer	Print Name	Signature	Date
Subject Matter Expert	Jennifer Griffin	[signature]	6/15/10
QA Specialist	Larry Maassen	/s/ Larry Maassen	6-11-10
Responsible Line Manager	Jeff Erickson	[signature]	6/15/10
Other	Pete Rice	/s/ Pete Rice	6-14-10

CSE USQ Number (as applicable): NA 9PK 6-15-10

Authorized Derivative Classifier: ☑ Unclassified ☐ OUO ☐ UCNI ☐ Classified

Signature: [signature] JOSEPH LOWERY Date: 6/15/2010

Section #4 – Training Review

Training Required: ☐ Yes ☑ No ☐ Classroom/Briefing ☐ Just-in Time ☐ On the Job ☑ Required Reading

Training Representative Signature:	Print Name:	Course #:
Pamela Flores	Pamela Flores	54357

Section #5 – Final Approval by Procedure Owner

Validation Required: ☐ Yes ☑ No

Hazard Category: ☐ Low ☑ Med ☐ High

Is the document authorized to serve as Part I of the Integrated Work Document? ☐ Yes ☑ No

Approval Signature:	Print Name:	Phone:	Z Number:	Date:
[signature]	Jeff Erickson	500-6172	186627	6-15-10

/s/ is used to indicate that the signature is on file. The signature(s) or email(s) are part of the Document History File (DHF) JOR - 6/16/10

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Los Alamos NATIONAL LABORATORY EST. 1943

Section #1 – Type of Request

Document Number:	Revision:	Title:			
TA21-MDAB-PLAN-00017	0	MDA-B Sampling and Analysis Plan			
Requestor Signature:	**Print Name:** Randy Morgan		**Phone:** 665-5446	**Z Number:** 236297	**Date:** 05/27/2010

Section #2 – Procedure Owner Approval for Processing

☑ New Document ☐ Major Revision ☐ Minor Revision ☐ Deactivation ☐ Cancellation

Periodic Review: 1 Year ☐ 2 Year ☐ 3 Year ☐ 4 Year ☐ 5 Year ☑

If new document, describe document type: Instructions

Provide a detailed description of the requested change. (Attach additional sheets if needed. Number all additional sheets.):

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☐ Approved ☐ Disapproved (Return to originator) | Priority: High

Procedure Owner Signature:	Print Name: Jeff Erickson	Date:

Section #3 – Review and Concurrence

Review and Concurrence: Obtain concurrence from all review organizations. (Enter N/A for not applicable.) Document all additional review organizations, if needed, on a continuation sheet. Cognizant System Engineer Program (CSE) approval is required for all technical procedures except minor revisions, and non-authorization-basis-related cancellations/ deactivations. CSE approval is always required for changes affecting safety-basis steps.

Reviewer	Print Name	Signature	Date
~~Subject Matter Expert~~ OS-BSI	Glenn Siry	/s/ Glenn Siry	6/15/10
~~QA Specialist~~ REG-WS	Susan Ramsey	/s/ Susan Ramsey	6/15/10
~~Responsible Line Manager~~ ET-ER	Gerald Fordham	/s/ Gerald Fordham	6/11/10
~~Other~~ PMFS-DO	Mitch Goldberg	/s/ Mitch Goldberg	6/11/10
CSE USQ Number (as applicable):	Authorized Derivative Classifier: ☐ Unclassified ☐ OUO ☐ UCNI ☐ Classified Signature: _____ Date: _____		

Section #4 – Training Review

Training Required: ☐ Yes ☐ No	☐ Classroom/Briefing	☐ Just-in Time	☐ On the Job	☐ Required Reading
Training Representative Signature:		**Print Name:**		**Course #:**

Section #5 – Final Approval by Procedure Owner

Validation Required: ☐ Yes ☐ No	Hazard Category: ☐ Low ☐ Med ☐ High	Is the document authorized to serve as Part I of the Integrated Work Document? ☐ Yes ☐ No		
Approval Signature:	**Print Name:**	**Phone:**	**Z Number:**	**Date:**

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Section #2 – Procedure Owner Approval for Processing

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Periodic Review: 1 Year ☐ 2 Year ☐ 3 Year ☐ 4 Year ☐ 5 Year ☑

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Provide a detailed description of the requested change. (Attach additional sheets if needed. Number all additional sheets.):

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Reviewer	Print Name	Signature	Date
~~Subject Matter Expert~~ WES-WGS	Alicia Amerson	/s/ Alicia Amerson	6-14-10
~~QA Specialist~~ Industrial Safety	Henry Kana	Henry Kana	6-15-10
~~Responsible Line Manager~~ RP-1	Martin Peifer	/s/ Martin Peifer	6-11-10
~~Other~~ Waste Services	Don Allen	/s/ Don Allen	6-14-10
CSE USQ Number (as applicable):	Authorized Derivative Classifier: ☐ Unclassified ☐ OUO ☐ UCNI ☐ Classified Signature: _____ Date: _____		

Section #4 – Training Review

Training Required: ☐ Yes ☐ No	☐ Classroom/Briefing	☐ Just-in Time	☐ On the Job	☐ Required Reading
Training Representative Signature:		**Print Name:**		**Course #:**

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Approval Signature:	**Print Name:**	**Phone:**	**Z Number:**	**Date:**