EP-DIR-SOP-10021, R1

Characterization and Management of Environmental Programs Waste

Effective Date: 7/25/14

Procedure Owner:	Signature:	Date:
Andy Baumer	/s/Mike Alexander for Andy Baumer	7/25/14

REVISION HISTORY

Document No./Revision No.	Issue Date	Action	Description
EP-DIR-SOP-10021, R0	3/22/12	Major revisions; Total Rewrite	New document control number assigned; Supersedes SOP-5238
EP-DIR-SOP-10021, R1	7/25/14	Major revision	Added technical content to procedure pertaining to operational waste. Changed forms requirements in Section 5 and added WCATS.

TABLE OF CONTENTS

1. PURPOSE

This Standard Operating Procedure (SOP) delineates the process for characterizing and managing waste generated by the Environmental Programs Directorate (ADEP) at the Los Alamos National Laboratory (LANL or Laboratory). There are two main programs within ADEP that generate waste and each one has regulatory requirements unique to that program. The Corrective Action Program (CAP) performs environmental investigation, remediation, and decommissioning and demolition (D&D) activities that typically generate bulk volumes of water, soil and debris. The majority of the regulatory requirements for the CAP are found in the Compliance Order on Consent (Consent Order) and the NPDES Individual Permit (IP). The LANL Transuranic Waste Program (LTP) operates waste storage and remediation facilities for the Laboratory. The primary requirements documents for operational waste are DOE O435.1, Radioactive Waste Management, and the LANL Resource Conservation and Recovery Act (RCRA) Hazardous Waste Facility Permit (HWFP).

2. REFERENCES

This SOP shall be used in conjunction with the most recent revision of LANL documents, policies, or equivalent LANL-approved contactor waste procedures associated with waste management activities. These documents, policies, and procedures include, but are not limited to:

- ENV-RCRA-QP-010, Land Application of Groundwater
- ENV-RCRA-QA-011, Land Application of Drill Cuttings
- MAN-5001, User Manual for Waste Profile Charge Code Form
- MAN-5002, User Manual for the Waste Item Inventory (WII) Form
- MAN-5003, User Manual for The Waste Disposal Request (WDR) Form
- P101-14, Chemical Management
- P101-17, Excavation/Fill/Soil Disturbance
- P121, Radiation Protection Requirements
- P151-1, Packaging and Transportation
- P300, Integrated Work Management
- P313, Roles, Responsibilities, Authorities, and Accountabilities
- P330-6, Non-Conformance Reporting
- P322, Issues and Corrective Action Management
- P409, Waste Management
- P781-1, Conduct of Training Manual
- P930-1, LANL Waste Acceptance Criteria
- P930-2, Waste Certification Program
- P930-3, Offsite Shipment of Chemical, Hazardous, or Radioactive Waste
- EP-DIR-AP-10003, Records Management Procedure for ADEP Employees
- SOP-5181, Notebook and Logbook Documentation for Environmental Directorate Technical and Field Activities
- EP-DIR-QAP-0001-Quality Assurance Plan for the Environmental Programs Directorate

2. References, cont.

- EP-ERSS-SOP-5056, Sample Containers and Preservation
- EP-ERSS-SOP-5057, Handling, Packaging, and Transporting Field Samples
- EP-ERSS-SOP-5058, Sample Control and Field Documentation
- EP-ERSS-SOP-5059, Field Quality Control Samples
- EP-ERSS-SOP-5061, Field Decontamination of Equipment
- EP-ERSS-SOP-5029, Drilling Plan Development
- SOP-12.01, Field Logging, Handling, and Documentation of Borehole Materials
- SOP-06.09, Spade and Scoop Method for Collection of Soil Samples
- SOP-06.10, Hand Auger and Thin-Wall Tube Sampler
- TL-007/TL-008/TL-112, Acceptable Knowledge Guidance
- TL-001, Waste Profile Form Guidance
- TL-003, Chemical Waste Disposal Request Guidance
- EP-AREAG-WO-AP-1157, LTP Low-Level/Mixed Low-Level Waste Data Verification/Reclassification

3. BACKGROUND AND PRECAUTION

The Consent Order is an enforcement document signed by the New Mexico Environment Department (NMED), the New Mexico Attorney General, Department of Energy (DOE), and the University of California on March 1, 2005, that prescribes the requirements for corrective action at the Laboratory. The Consent Order contains specific requirements for management of investigation-derived waste (IDW) generated by the Laboratory in the course of corrective action, investigation, and remediation, which are typically implemented through work plans that are prepared by the Laboratory and approved by the NMED.

Other non-Consent Order, waste-generating activities conducted by CAP include D&D activities and those driven by the LANL HWFP, such as RCRA permitted unit closures. LTP activities that generate waste include waste repackaging, decontamination, size reduction, characterization, storage and shipping. In addition, routine facility operations and maintenance activities also generate waste.

Wastes generated by ADEP programs include hazardous waste, New Mexico special waste (NMSW), polychlorinated biphenyls (PCB) waste, low level radioactive waste (LLW), transuranic waste (TRU), mixed waste (MW) (MLLW & MTRU), and industrial and municipal solid waste. Environmental media (e.g., soil, tuff, and groundwater) and other IDW may fall into any of these regulatory classifications. Documentation and characterization requirements beyond those described in this procedure may exist for waste intended for disposition at off-site Treatment, Storage, and Disposal Facilities (TSDFs).

4. DEFINITIONS

NOTE: *A glossary of definitions associated with P409, Waste Management, is available at:* https://policy.lanl.gov/pods/policies.nsf/MainFrameset?ReadForm&DocNum=P409&FileName=P409.pdf. *Waste management-specific definitions not included in the glossary are provided in this section. Other definitions were modified as needed to clarify the requirements of this procedure.*

Accumulation Start Date — The term "accumulation start date" is the date in which the waste becomes regulated and subject to an accumulation start date. The accumulation start date for various types of wastes is:

- PCB Waste: the date that generator receives data that identifies it as a PCB-regulated waste.
- NMSW: the date that the waste container is sealed and ready for transport.
- Radioactive Waste (does not include mixed waste): the date the waste is packaged for storage or transport. If the material is to be land applied, the accumulation start date does not occur until the determination has been made that the material cannot be land applied and data are available to determine that it is radioactive waste.
- RCRA Waste (hazardous waste and mixed waste): the day the waste was first managed in a <90-day storage area or a permitted unit, unless it is managed within a drill pit or an SAA. For RCRA waste in drill pits, the accumulation start is the day the waste is removed from the drill pit. For wastes originating in an SAA, the accumulation start date is the day the waste is removed from the SAA and stored in a <90-day storage area. If the waste is moved from an SAA to a permitted storage or treatment unit, the accumulation start date is the date the waste was received at the permitted unit. If the waste is moved from a <90-day storage area to a permitted storage or treatment unit, the accumulation start date is reset to the date the waste was received at the permitted unit.
- Returned Samples: the day the waste generator receives the returned sample.

NOTE: ***For making a waste determination, see "Generation Date".***

Area of Contamination — A discrete area of generally dispersed contamination, which is considered to be equivalent to a RCRA unit. Because an Area of Contamination is equated to a RCRA unit, movement within, consolidation of waste within, or in-situ treatment within the Area of Contamination does not create a new point of hazardous waste generation for purposes of RCRA (EPA Office of Solid Waste and Emergency Response, Publication 530-F-98-026).

Contact Waste — Contact waste is material that may have come into contact with contaminated media or debris. Contact Waste includes spent personal protective equipment, contaminated sampling supplies, plastic, dry decontamination and other material that may have come in contact with contaminated media or debris.

Contained-In — Environmental Media and debris contains hazardous waste when:

- It exhibits a characteristic of a hazardous waste; or it is contaminated with concentrations of hazardous constituents that originated from listed hazardous waste.

4. Definitions, cont.

- Environmental Media and debris is considered to no longer contain hazardous waste when it no longer exhibits a characteristic of hazardous waste or the regulatory agency determines that concentrations of hazardous constituents from listed hazardous waste are below health-based levels based on data submitted by the facility.

Debris — Debris is defined in 40 CFR 268.2 (g) as a "solid material exceeding a 60 mm particle size that is intended for disposal and that is: A manufactured object; or plant or animal matter; or natural geologic material.

Drill Cuttings — Drill Cuttings—Borehole cuttings and core, soil, and rock sediments produced during the drilling, development, and rehabilitation of wells or boreholes.

Data Quality Objectives (DQO) Process —The DQO process addresses the planning cycle for a project from problem statement through the data collection design to make decision about whether or not regulatory thresholds are exceeded.

Environmental Media — Borehole cuttings and core, soil, rock, sediments, surface water, and groundwater that are displaced during corrective action.

Generation Date — For making a waste determination, the term "generation date", is the date the material is generated. This does not include waste generated in drill pits, or Areas of Contamination. For drill pits, the generation date begins when the waste is removed from the drill pit. For Areas of Contamination, the generation date begins when the waste is removed from the boundaries of the Area of Contamination.

Hazardous Constituent (hazardous waste constituent) — (1) a constituent that causes the administrative authority to list the hazardous waste in 40 CFR Part 261, Subpart D, or a constituent listed in Table 1 of 40 CFR Part 261.24; (2) According to the March 1, 2005, Compliance Order of Consent (Consent Order), any constituent identified in Appendix VIII of Part 261, Title 40 CFR (incorporated by 20.4.1.200 New Mexico Administrative Code [NMAC] or any constituent identified in 40 CFR 264, Appendix IX (incorporated by 20.4.1.500 NMAC).

Hazardous Waste — 1) solid waste (as defined in 40 CFR 261.2 and incorporated by 20.4.1.200 NMAC) that is not excluded from regulation as a hazardous waste and is a listed hazardous waste (as provided in 40 CFR Part 261, Subpart D, incorporated by 20.4.1.200 NMAC) or a waste that exhibits any of the characteristics of hazardous waste (i.e., ignitability, corrosivity, reactivity, or toxicity, as provided in 40 CFR Part 261, Subpart D, incorporated by 20.4.1.200 NMAC; or is a mixture of solid waste and one or more hazardous wastes listed in 40 CFR Part 261, Subpart D (also see P409).

Industrial Waste — Solid waste generated by manufacturing or industrial processes that is not hazardous waste regulated under Subtitle C of RCRA or radioactive waste (also see P409).

4. Definitions, cont.

Investigation-derived waste (IDW) — Solid or hazardous waste that was generated as a result of investigation and/or characterization corrective action activities. IDW may include drilling fluids, cuttings and purge water from test pit and well installation; purge water, soil, and other materials from collection of samples; residues from testing of treatment technologies and pump and treat systems; contaminated PPE; and solutions (aqueous or otherwise) used to decontaminate non- disposable PPE (EPA Office of Solid Waste and Emergency Response, Publication 9345.3-03FS, January 1992) (also see P409).

Land Application — The placement of drill cuttings, drilling water, purge water, or development water onto land in compliance with ENV-RCRA-QP-10, Land Application of Groundwater and ENV-RCRA-QP-11, Land Application of Drill Cuttings or the reuse of environmental media as described in NMED-approved documents.

New Mexico Special Waste (NMSW) — Solid waste identified in the New Mexico Solid Waste Management Regulations (20.9.1.105. BZ) as requiring unique handling, transportation, or disposal to assure protection of the environment and the public health, welfare, and safety. NMSW includes treated formerly characteristic hazardous waste, asbestos waste, ash, infectious waste, sludge, industrial solid waste, spill of a commercial chemical product, dry chemicals that become characteristic hazardous waste when wetted, and petroleum-contaminated soil.

NOTE: *P409 contains specific requirements for managing special waste*

Operational Waste — Waste generated during the operation and maintenance of facilities. Some examples of operational waste though not all inclusive include repackaged waste from other facilities, empty drums, sump water and job waste i.e. plastic tape, gloves, Personal Protective Equipment (PPE), work control.

Pending land application — ENV has approved the land application package and the materials are awaiting placement onto land.

Polychlorinated biphenyl (PCB) — Any chemical substance that is limited to the biphenyl molecule that has been chlorinated to varying degrees or any combination of substances which contains such substance. (40 CFR §761.3).

PCB Waste — PCB waste is defined at 40 CFR 761.3 as those PCBs and PCB items that are subject to the disposal requirements found at Subpart D, "Storage and Disposal," of 40 CFR Part 761.

PCB Remediation Waste — PCB remediation waste encompasses soil, rags, and other debris generated as a result of any PCB spill not cleaned up under Subpart G but cleaned up under 40 CFR 761.61 (including materials from "old spills") or from other unauthorized disposal. Such waste includes, but is not limited to; Bulk PCB Remediation Waste, Non-Porous Surfaces, Porous Surfaces, Liquid PCB Remediation Waste, Cleanup Waste (also see P409).

4. Definitions, cont.

- Bulk PCB Remediation Waste: Bulk PCB remediation waste includes, but is not limited to, the following non-liquid materials which are contaminated with PCBs: soil, sediments, dredged materials, mud sewage sludge, and industrial sludge [40 CFR 761.61(a)(4)(i)].
- Non-Porous Surfaces: Non-porous surfaces means a smooth, unpainted surface that limits penetration of liquid containing PCBs beyond the immediate surface. Some examples are as follows: smooth uncorroded metal, smooth glass, smooth glazed ceramics, and high-density plastic that do not absorb organic solvents.
- Porous Surfaces: Unlike non-porous surfaces, porous surfaces do not prevent or minimize penetration of PCBs beyond the immediate surface. Examples are concrete, cement, corroded metal, asphalt, plaster, paint or coating on metal, paper, cardboard.
- Liquid PCB Remediation Waste: Liquid PCB remediation waste [40 CFR 761.61(a)(4)(iv) and (a)(5)(iv)] includes but is not limited to water removed from dewatering of bulk PCB remediation waste, aqueous decantate from sediment, leachate collected from on-site storage of bulk PCB remediation waste, and run-off from fire suppression involving PCBs.
- Cleanup Wastes: Cleanup wastes [40 CFR 761.61(a)(5(v)] include non-liquid cleaning materials and personal protective equipment waste at any concentration. Examples are rags, gloves, booties, and other disposable items. Cleaning solvents, abrasives, and equipment used in cleanup constitute a subcategory of cleanup wastes.

Radioactive Waste — Low-level radioactive waste is radioactive waste that is not high-level radioactive waste, spent nuclear fuel, transuranic waste, byproduct material (as defined in Section 11e (2) of the Atomic Energy Act of 1954, as amended), or naturally occurring radioactive material.

Use or Reuse — A material that is either employed as an ingredient in an industrial process to make a product or employed in a particular function or application as an effective substitute for a commercial product.

Waste Generator (WG) — LANL individuals whose act or process produces hazardous waste or whose act first causes a hazardous waste to become subject to regulation. (40 CFR **§260.10; Title 20** of the New Mexico Administrative Code, Chapter 4, Part 1, Section 100 (20.4.1 .100 N MAC)) (also see P409).

Waste Management Coordinator (WMC) — The individual responsible for coordinating waste management activities on behalf of waste generators, line managers, facility managers, field project leaders, waste management groups, and other Laboratory organizations. This individual also coordinates resolution of waste management issues on behalf of his/her waste-generating organization and reviews documents pertaining to the management of waste.

Waste Acceptance Criteria (WAC) — Criteria established by the receiving facility that must be met before a waste is accepted for treatment, storage, or disposal. Waste acceptance criteria may involve the physical form of a waste, a waste's container, its radioactivity, packaging, labeling, etc. (also see P409).

4. Definitions, cont.

Waste Compliance and Tracking System (WCATS) – A software application that has been specifically designed to manage LANL's waste from cradle-to-grave. The system provides the proper support needed for characterization, generation, processing, and shipment of all waste created at LANL.
REQUIRED DOCUMENTS AND FORMS.

Descriptions of commonly used forms required to document waste management activities are listed below. Forms and guidance can be found at http://int.lanl.gov/environment/waste/flst/full_list.shtml

- **Land Application Data Certification Sheet.** This form is required by ENV-RCRA-QP-10. It must be completed by the Generator or their designee and approved by ENV prior to land application of drilling, development, rehabilitation, and sampling purge waters to ensure the requirements of the NMED-approved NOI Decision Tree, *Land Application of Drilling, Development, Rehabilitation, and Sampling Purge Water,* can be met.

- **Land Application Field Certification Sheet.** This form is required by ENV-RCRA-QP-10. It must be completed by the Generator or their designee after land application certifying that all procedural requirements for land application of drilling, development, rehabilitation, and sampling purge waters were met.

- **Post Land Application Field Certification Sheet.** This form is required by ENV-RCRA-QP-11. It must be completed by the Generator, Project Manager, STR, or their designee at the time of land application of drill cuttings to certify that all procedural requirements were met. Any deviations from the Request for Land Application of Drill Cuttings Form must be documented on the Field Certification Sheet and approved by ENV prior to land application.

- **Request for Land Application of Drill Cuttings Form.** This form is required by ENV-RCRA-QP-11. It must be completed by the Generator or their designee and approved by ENV prior to land application of drill cuttings. It is used to ensure requirements of the NMED-approved NOI Decision Tree, *Land Application of IDW Solids Form Construction of Wells or Boreholes,* can be met.

- **Uniform Hazardous Waste Manifest**. The manifest is used to track hazardous waste shipped from a generator's site to the site of its disposition.

- **Waste Characterization Strategy Form (WCSF)**. The WCSF is a planning and implementation document to be prepared before certain waste-generating activities are undertaken. The WCSF is required for Consent Order work but may be prepared for other ADEP work as necessary. The WCSF documents planned field activities and the characterization approach for each waste stream expected to be managed. The WCSF is used to implement the IDW requirements of the work plan.

5. CORRECTIVE ACTION PROGRAM WASTE

Some steps in the following process must be completed by LANL personnel while others may be completed by subcontractors. When a subcontract activity will generate waste, the Exhibit D or Exhibit F must specify which waste management functions in the procedure will be performed by subcontractor, as well, as whether the subcontractor will complete some of the documentation required by this procedure.

5.1 Area of Contamination Policy

1. Where appropriate, establish an Area of Contamination (AOC) in accordance with this procedure at least 30 days prior to waste generation in the project area. The AOC designation must be approved by NMED prior to implementation.

   NOTE*: The AOC Policy allows certain discrete areas of generally dispersed contamination to be considered RCRA Land Disposal Units and, thus, movement and in-situ treatment of hazardous waste is allowed without triggering land disposal restrictions or minimum technology requirements. However, NMED has not supported establishing an AOC during investigation, remediation or corrective measures projects unless they have specifically approved its use.*

   Investigation and remediation activities will not create a new point of hazardous waste generation if carried out within the NMED-approved AOC. Therefore, the 90-day clock for hazardous waste generation will not be triggered as long as the waste remains inside the AOC boundary. The AOC Policy applies to any hazardous remediation waste (including non-media waste) that is in or on the land. It does not apply to non-hazardous wastes, such as LLW, PCB remediation waste, TRU, and NMSW, etc. Each of these wastes must be managed in accordance with their specific accumulation requirements.

2. To request an AOC designation, provide the following information to the ENV-CP Rep:
   - A schematic showing the boundaries of the AOC (include roads if it will assist in transporting wastes within the AOC).
   - The types and forecasted volumes of wastes that will be managed under the policy.
   - How the wastes will be managed within the AOC boundaries (e.g., in piles with best management controls, in containers, etc.).
   - Whether some of the environmental media will be reused and how the decision will be made for its reuse (e.g., it meets residential soil screening levels).

3. The ENV Rep prepares the request for AOC designation and submits to NMED for approval. Distribute copies to the Waste Generator (WG), PM and Waste Management Coordinator (WMC).

5.1 Area of Contamination Policy, cont.

NOTE*: For Consent Order-driven work, NMED requires that the AOC designation request be submitted at least 15 days prior to initiation of field activities*.

5.2 Preparation of the Waste Characterization Strategy Form (WCSF)

1. The WMC assigned to the waste generating activity prepares the WCSF.

2. Before preparing the WCSF, the WMC shall:

- Identify all waste streams that are anticipated to be generated by the work.
- Working with the subcontractor, identify probable off-site TSDFs for the waste anticipated to be generated. Identified waste streams should align with probably TSDFs waste profiles whenever possible.
- Identify requirements specified in the work plan, closure plan, or other approved work documents.
- Review available data and source information for the planned work sites to determine how to initially manage wastes (e.g., hazardous, non-hazardous, LLW, etc.). Reference appropriate documents and data that support the initial handling decisions in the WCSF.
- Determine whether existing data meets the requirements for acceptable knowledge (AK), as specified in ENV-RCRA-TOOL-112.0, *Acceptable Knowledge,* for hazardous or radiological constituents. If there is reliable, relevant, and traceable information based on AK, document the AK in the WCSF. If necessary, develop a strategy for sampling and analysis that will complete the characterization for the waste stream.
- If there is no reliable information concerning hazardous or radiological constituents, develop a strategy for sampling and analysis that will identify and quantify all chemicals of potential concern in the waste stream and document in the WCSF.
- Review the most recent waste acceptance criteria (WAC) for potential receiving TSDFs to ensure that analytical suites identified in the WCSF meet the receiving facilities' WAC.
- The waste generator shall ensure that any radioactive and mixed wastes anticipated to be generated are covered by an approved Radioactive Waste Management Basis (RWMB). If not, request that the RWMB report preparer update the RWMB.
- If the waste is a category that can be land applied (drilling fluids, purge water, development water, or drill cuttings), review the land application procedures to ensure that the analytical suites identified in the WCSF are appropriate for land application.

5.3 Review and Approve the Completed WCSF

1. Initiate the review, approval, and tracking of the draft WCSF in accordance with procedure SOP-4066, Document Development and Deliverables Compliance Process. Typically, allow a two-week minimum for the review and approval process.

5.3 Review and Approve the Completed WCSF, cont.

2. The PM, ENV Rep, WMC, and WG shall review and confirm that the draft WCSF is consistent with the approved work plan along with any "contained in" determinations, Area of Contamination designations, Due Diligence reports, or other provisions approved by ENV- and/or the NMED. All shall provide comments on the WCSF.
3. The PM, ENV Rep, and WMC shall approve and sign the final WCSF when comments have been resolved and incorporated into draft WCSF.
4. The WMC and PM shall ensure all field operations personnel are briefed on, and agree to comply with, the WCSF requirements. Briefing documented by attendance signature page.

5.4 Amendment of the WCSF

1. In the event a WCSF Amendment must be prepared, the author shall ensure that a WCSF prepared under previous versions of this procedure is amended as needed to meet current procedural requirements.

2. The author should amend the approved WCSF under the following conditions:
   - when an unanticipated waste is generated,
   - when an approved strategy for management of a waste stream significantly changes, or
   - when a selected TSDF changes necessitating a change to WAC compliance.

3. When a correction to the approved form is necessary, complete the WCSF Amendment Form (Attachment 1).

4. Submit the WSCF Amendment to the original reviewers, as appropriate, for review and comment.

5. The author shall obtain resolution to all comments and incorporate them into the WCSF Amendment.

6. The original signatories shall approve and sign the WSCF Amendment.

5.5 Waste Management and Documentation

1. Obtain appropriate waste containers with requisite certification and documentation. If the project contract stipulates the subcontractor provide the waste containers, the subcontractor shall provide the WMC with copies of requisite documentation.

   - Personnel will be trained on proper container closure and all packages will be closed according to the manufacturers' instructions.

5.5 Waste Management and Documentation, cont.

- Inspect containers in accordance with DOT standing inspection requirements before use. If the containers have been previously used, ensure they are adequately decontaminated before re-use.
- Ensure containers are properly marked and labeled and/or meet LANL requirements for free release.
- Do not use compromised or otherwise damaged containers for waste packaging.

2. If WCSF identifies direct offsite disposal of Radioactive Waste to a Non-DOE TSDF, verify with LANL WPS-LLWD that there is an approved Exemption Request in place. If an approved Exemption Request is not in place, supply the required data to WPS-LLWD in accordance with ENV-RCRA-TOOL-602.

3. Establish appropriate areas for accumulating/storing waste (e.g., <90 day accumulation area, SAA, Universal Waste Area, Used Oil Area, NMSW Area, radioactive waste staging or storage area) in accordance with P409, Waste Management. Register regulated waste storage areas and provide Site ID Number(s) to the FWMT, WMC, and WG.

   - RCRA waste accumulation site registration (http://hsr-web2.lanl.gov/~esh19/databases/hwts_form.html)
   - Radioactive Waste Staging/Storage registration (http://hsr-web2.lanl.gov/~esh19/databases/rad_registrationform.shtml).

4. Verify that the registered waste area is properly posted, managed, and inspected, as necessary.

5. Store wastes in new, unused containers, unless specifically permitted to use reusable containers. Reusable containers must have documented radiological survey results showing the container is not contaminated and has been released.

6. Perform all necessary inspections, recordkeeping, and reporting requirements for accumulation, staging, or storage areas in accordance with P409, *Waste Management* and the LANL Hazardous Waste Facility Permit.

7. Participate in periodic LANL and regulatory agency waste management compliance inspections.

8. If the waste(s) requires sampling for characterization, the Subcontract Technical Representative (STR) shall inform the FWMT and WMC of the intent to sample.

5.5 Waste Management and Documentation, cont.

9. Collect representative waste samples in accordance with EPA guidance (EPA, 1986. SW-846, Chapter 9 (Sampling Plan) http://www.epa.gov/epawaste/hazard/testmethods/sw846/pdfs/chap9.pdf or an approved LANL and/or Subcontractor sampling plan.

10. Manage samples in accordance with LANL procedures (EP-ERSS-SOP-5056, Sample Containers and Preservation, EP-ERSS-SOP-5058, Sample Control and Field Documentation).

11. Establish waste management requirements for returned samples, if applicable, based on the approved work plan, WCSF, or waste characterization plan.

12. The Waste Services Manager should perform independent audits of waste management. Inform the WG of any waste management issues.

13. Disposition waste in compliance with regulatory time limits. If regulated waste cannot be dispositioned within required time limits, notify the PM and the ENV Rep at least 10 days prior to the time limit expiration.

14. Ensure all wastes, materials, or equipment are dispositioned, and not left on-site at the end of project field-work without the prior approval of the appropriate ADEP Program Director.

5.6 Waste Determinations and Documentation

1. Provide the waste Event Numbers and Sample Numbers to the LANL or project data steward.

2. The data steward shall track the analytical or characterization data from sample ID or Event Number.

3. Sample analysis turnaround must be appropriate to meet regulatory accumulation time limits.

4. ADESH-OIO performs data validation.

5. The data steward may request Automated Waste Determinations (AWDs), as appropriate, and provide analytical data to the WMC for waste determination. The data steward may provide radiological analytical results to waste characterization engineers for LLW waste determination.

5.6 Waste Determinations and Documentation, cont.

6. MCs shall make waste determinations/characterization within 30 days of the date of waste generation unless otherwise specified in the WCSF. ENV-may provide assistance in making waste determination, if necessary or requested.

7. If a "No Longer Contained-In" determination is needed (see Section 2.8), request that ENV initiate the "No Longer Contained-In" request when waste determinations are complete but no later than day 70 of the accumulation time limit or 15 working days before the end of the accumulation time limit, whichever time is less.

8. For wastes in <90-day areas:

   - For wastes in a <90-day area, if a waste determination cannot be made within 30 days, submit a WEF to LANL Waste Services before day 30 of the waste accumulation time limit.

   - If a waste determination is not complete by day 70 or 15 working days before the end of the accumulation time limit (whichever is shorter), request that ENV determine whether there is justification to request a <90 day accumulation time limit extension from the NMED. Note that extensions can only be granted if there are extenuating circumstances, which do not include failure to make a waste determination. However, providing NMED with time to review a "contained-in" request is a valid reason for requesting a <90 day accumulation time limit extension. Concurrently, begin contingency planning in the event that the extension request is not granted.

   - At Day 80 of the <90 day clock, if the request for a <90 Day extension is not granted by NMED, prepare to ship as regulated waste prior to expiration of the <90 day clock.

9. Determine whether existing Waste Profile Forms (WPFs) that are still active can be used for newly-generated wastes. If not, prepare a new WPF in WCATS. If a "contained-in" determination or due diligence review applies to the waste, upload the appropriate document to the WPF. Ensure that required signatures have been obtained on the EP Document Signature Form from ENV-CP.

10. Submit the WPF through WCATS.

5.6 Waste Determinations and Documentation, cont.

11. Obtain and complete the offsite TSDF's WPF, and obtain TSDF approval for the off-site WPF, if applicable.

12. WCATS will notify the WMC that an approved LANL WPF is in place for waste shipment. Notify the WG and WMC that an approved off-site TSDF WPF is in place for waste shipment, if applicable.

5.7 Using the "Contained-in" Definition for Wastes

1. Where appropriate, ENV will implement the "Contained-in Policy" in accordance with this procedure.

    - Waste that contains a characteristic hazardous waste can only become non-characteristic if it is treated. Some types of treatment may occur on-site but restrictions apply. Coordinate with the ENV Rep and obtain documentation confirming the activity is currently allowed under the LANL HWFP before treating any wastes. Determination that a waste is no longer characteristic requires no formal approval by NMED. Land Disposal Restrictions (LDR) will still apply to the de-characterized waste (i.e., waste must meet LDR treatment standards before disposal).

    - Regulatory agency approval is required to declare that waste that contains hazardous constituents originating from listed hazardous waste sources (F-, K-, P-, or U-listed) is no longer listed. NMED makes this determination after reviewing data submitted by LANL that shows that the concentrations of hazardous constituents are below health-based levels, such as EPA Drinking Water Standards or NM WQCC groundwater standards.

2. When environmental media and/or debris are contaminated with hazardous constituents from listed hazardous waste, the WMC shall submit all applicable data and site information to the ENV Rep for assistance in determining whether concentrations of the hazardous constituents are below health-based levels.

3. If contaminant concentrations are below health-based levels, ENV will prepare and submit a request for a No Longer Contained-In approval to NMED on behalf of the project, requesting that NMED determine that the media/debris no longer contains listed waste.

5.7 **Using the "Contained-in" Definition for Wastes**

4. ENV will provide a copy of the letter requesting "contained-in" approval and the NMED letter approving the 'contained-in" to the WG, and WMC.

5. Ensure the "No Longer Contained-In" determinations approved by NMED are implanted as part of the project's waste management activities. Upload the "No Longer Contained-In" request and approval letter to applicable WPF in WCATS.

5.8 Minimization and/or Recycling of Waste

1. Reduce the volume of waste generated by as much as is technically, legally, and economically feasible.

   - Evaluate environmental media (soil, rock, and well drilling development, rehabilitation, and purge water) for land application, in accordance with ENV-RCRA-QP-010, *Land Application of Groundwater*.

2. Evaluate use of Green is Clean (GIC). GIC waste generated in radiological control areas includes all non-regulated waste that has been actively segregated as "clean" (that is, non-radioactive) through the use of waste-generator AK. Environmental program waste meeting the requirements should be considered for GIC: paper products and cardboard, pieces of low-density wood small enough to fit into the approved containers (e.g., GIC green-striped bags, 2-cubic foot cardboard boxes with or without plastic lining, or other plastic bags or cardboard boxes as approved by the GIC Operations systems engineer);
   plastic products including common Personal Protective Equipment (PPE); and/or cloth or rags, including nylon and other low-density synthetic fabrics. Small amounts of high-density material such as dirt, dust, or other debris incidentally associated with low-density GIC waste are acceptable. However, dirt and dust contain natural radioactivity that may prevent the waste from passing the verification check. Packaging, barcoding, restrictions and weight requirements for Green Is Clean can be found in the LANL WAC, P930-1, Attachment 12.

3. Report waste minimization and/or recycling efforts to the WG at the end of field operations and in Consent Order-required IDW reports.

   NOTE: *This information is included in an annual report, the Hazardous Waste Minimization Report, which is a requirement of Permit Section 2.9 of the LANL HWFP.*

5.9 Generator Treatment of Wastes On-Site Prior to Disposal

Certain types of treatment can be conducted in <90 day accumulation areas or in-situ in an Area of Contamination. Treatment in these areas does not require a RCRA permit but must be documented by ENV. Contact ENV before any on-site treatment is conducted.

5.10 Waste Packaging and Transport

1. Verify a LANL Waste Profile Form is active for the waste to be shipped.

2. Verify that an off-site waste profile has been completed and is approved and active for the waste to be shipped, if being disposed in an approved non-DOE TSDF in accordance with P930-3, Off-Site Shipment of Chemical, Hazardous, or Radioactive Waste.

3. Complete the WDR and submit WDRs as required for each waste type in accordance with P930-1, *Waste Acceptance Criteria:*

   NOTE: *Waste generators may request exemptions from or exceptions to the LANL WAC by using Form 1973, Waste Acceptance Criteria Exception Form (WEF). Exemptions or exceptions are requested when a generator cannot comply with a specific WAC or certification requirement, or when a requirement is not applicable.*

4. Notify the WMC and WG when the WDR and Uniform Hazardous Waste Manifest, if required, have been approved.

5. The transporters shall transport wastes in accordance with the off-site receiving facilities' WAC and DOT requirements.

   NOTE: *For wastes managed in a <90-day accumulation or NMSW areas, the WMC must arrange for shipment at Day 80, identified as a compliance driven **RUSH** to Waste Management Services. At Day 90 of the <90 day clock, if regulated waste is not shipped from the <90 day area, notify the ENV representative and support any actions required by ENV.*

6. Ensure all waste transportation containers for chemical and radiological hazards are labeled in accordance with DOT requirements and P121, *Radiation Protection*

7. Ensure that the DOT rating for maximum container weight is observed.

5.10 Waste Packaging and Transport, cont.

8. For radioactive waste stored in supersacks to be shipped off-site:

   - Personnel shall be trained in the correct closure of supersacks and all supersacks will be closed in accordance with manufacturers' instructions.
   - Supersacks should be stored on plastic sheeting in a slightly or gently sloped area that will allow precipitation or other moisture to drain. In situations where the WG, WMC and/or PM anticipate the supersacks being stored for three months or more, or during snow or rain events, the supersacks should be stored under tarpaulins or other cover.
   - The WG, WMC, and PM shall determine whether the supersack should be overpacked.
   - Each supersack shall receive a visual inspection to ensure labels are attached and legible, and that the supersack is secure and shows no signs of degradation. Lifting straps and the associated stitching used to attach the straps to the supersacks shall be inspected for integrity.
   - Original LANL Item ID numbers shall remain on the original supersack.
   - All DOT labels shall be applied to the outer overpack.
   - Prior to loading into the overpack, a radiological survey of the outside surface of the supersack shall be performed.
   - Prior to loading onto the truck, a radiological survey of the outside surface of the overpack shall be performed.

9. Ensure the waste to be shipped is in compliance with the approved waste profile.

10 If the waste is going to NNSS or a commercial disposal facility that requires containers to be "sealed" by the generator prior to shipment, record the date the container was sealed in the project notebook.

11. Coordinate waste transportation with the disposal facility in accordance with P930-3, *Offsite Shipment of Chemical, Hazardous, or Radioactive Waste.*

    NOTE: *Transportation shall be by an approved carrier in accordance with DOE's Motor Carrier Qualification Program (MCEP approved).*

12. Notify the WG, WMC, and LANL Transportation Coordinator of scheduled ship/pickup date of waste.

13. Inspect waste containers prior to shipment, and document the evaluation in the project notebook.

14. HMPT personnel complete off-site shipment DOT inspection per DOT checklist.

5.10 Waste Packaging and Transport, cont.

15. Verify that all shipping containers are secured by the carrier prior to transportation per DOT checklist.

6. OPERATIONAL WASTE

6.1 Waste Planning

Operational Waste is waste generated during the operation and maintenance of facilities within Environmental Programs (EP). Some examples of operational waste though not all inclusive include repackaged waste from various facilities, empty drums, sump water and job waste. Since operational waste encompasses a wide variety of waste matrices, a cradle to grave disposal strategy should be mapped out identifying preliminary characterization requirements before waste generation or repackaging. The goal of the waste generation organization is to understand the packaging and disposal requirements before waste generation in order to facilitate waste minimization and eliminate rework due to non-compliant waste.

Characterization of operational waste is to be completed using documentation from the generating organization prior to handoff of data to the Waste Management Coordinator (WMC). The WMC is responsible for entering the applicable data into WCATS. The WMC verifies a current LANL waste profile exists in WCATS or creates a new LANL profile based on the waste stream identified for off-site disposal. An independent review verification of the characterization and WCATS data will be performed via EP-AREAG-WO-1157. The LANL transportation coordinator is responsible for coordinating shipment and manifesting activities with the off-site TSDF shipping subcontractor or Indefinite Delivery/Indefinite Quantity (IDIQ) contract.

The Waste Acceptance Criteria of the final off-site TSDF should be consulted as to waste acceptance requirements applicable to the waste generated during waste planning and characterization. The eight waste types generated under EP include Industrial, Universal, New Mexico Special, Toxic Substances Control Act (TSCA), RCRA Hazardous Waste, Low Level and Low Level Mixed and Transuranic (TRU) Waste. Each type of waste stream will have specific requirements in relation to disposal of the final Off-Site TSDF to be addressed in the preliminary planning phase. Examples of components to be addressed during this phase include applicable radiological requirements, RCRA Hazardous and TSCA constituents, and the type of packaging configurations that are acceptable along with DOT requirements. Various resources are available to the generating organization during the waste planning stage. The P409 tools on the LANL intranet are available for waste management and characterization guidance concerning the various waste streams that encompass operational waste. In addition the appropriate Waste Management Coordinator (WMC), the Low Level waste characterization group and LANL Transportation Coordinator are available for waste planning assistance. Verification of each waste package is required and is

6.1. Waste Planning, cont.

formally documented utilizing Attachment 1 & 2 of procedure EP-AREAG-WO-1157. Waste planning should include consideration of the documentation required for the verification process in accordance with EP-AREAG-WO-1157.

The Waste Management Coordinator (WMC) assigned to the area of waste generation should be consulted as to the availability of a LANL Waste Profile Form (WPF) or whether a new profile form will need to be created. The following resources are available during the waste planning process including but not limited to:

- Waste Management Coordinator
- Waste Characterization Group
- LANL DOT Representative

6.2 Waste Characterization

Characterization is performed utilizing the P409 tools in order to meet the various regulatory requirements for the waste streams generated and managed by EP. This ensures all appropriate steps have been taken to characterize and verify the waste characterization process of each waste item. Waste is characterized using Acceptable Knowledge (AK) and/or direct sampling and analysis. In addition characterization methods such as Real Time Radiography, Non Destructive Assay or Flammable Gas Analysis can be utilized to support AK and determine the physical and chemical components of the waste.

AK is a method used by the waste generator to document characterization of wastes to reduce or eliminate the need for sampling and analysis. Sampling of LTP waste streams is typically difficult due to waste form (i.e. heterogeneous debris) or As Low As Reasonably Achievable (ALARA) concerns. It is therefore essential that AK is well documented. An AK review must be performed by a waste generator SME to determine if enough evidence is available to physically and chemically characterize the waste in a defensible manner without the use of sampling and analysis. AK is commonly used to characterize EP operational waste due to the fact that LANL processes are well documented and baseline documents have been developed for the many LANL waste streams. Consult the P409 tools such as ENV-RCRA-TOOL-111 and ENV-RCRA-TOOL-313 for details on how to use AK along with advantages and disadvantages of utilizing this characterization method. Examples of AK are listed below but are not limited to the following:

- Process design documents;
- Safety analysis reports (SARs), unreviewed safety question determinations (USQDs), and technical safety requirements (TSRs);

6.2 Waste Characterization, cont.

- Standard Operating Procedures (SOPs), Hazard Control Plans (HCPs), Activity Hazard Analysis (AHAs), and/or Detailed Operating Procedures (DOPs) that list raw materials or reagents, that describe the process/experiment which uses the materials, and that describe how the waste streams are generated and handled;
- Waste packaging logs completed when wastes are placed in containers;
- Test plans or research project reports that describe the reagents and other raw materials used in an experiment;
- Laboratory notebooks that detail the research processes and materials used in an experiment and the by-products and end-products generated;
- Site databases (e.g., chemical inventory database for Superfund Amendments and Reauthorization Act [SARA] Title III);
- Documented site personnel interview information;
- Standard industry practice documents (e.g., vendor information)
- Central Characterization Project LANL Waste Stream AK
- Safety Data Sheets (SDSs), product labels, and other product packaging information;
- Documented visual inspections that can be used to identify or confirm the physical characteristics and packaging of a waste (e.g., visual inspection forms, which can be explicit in the type of information to be collected, or detailed procedures on how these observations are recorded); and/or
- Documentation that demonstrates that surrogate materials accurately reflect the characteristics of the waste stream in question.

AK documentation for TRU waste is developed by the Central Characterization Project (CCP) by waste stream for the Laboratory. AK reports are organized by facility and waste category group below:

- S3000 – Homogeneous Solids
- S4000 – Soil/Gravel
- S5000 – Debris Waste

The CCP is tasked with certification of CH TRU waste for transportation to and disposal at the Waste Isolation Pilot Plant (WIPP). AK reports are developed in accordance with CCP-TP-005 (Reference 8), which describes how AK is collected, reviewed, and managed by the CCP. TRU AK can be used by the generator for characterization of low level waste that has been reclassified. EPA Hazardous Waste Numbers (or waste codes) in AK are assigned to each waste stream by taking into account the waste stream as a whole. Low Level waste often encompasses one waste item or a homogeneous set of waste. This enables the

6.2 Waste Characterization, cont.

generator or WMC to examine CCP AK that relates to the specific low level waste being analyzed and determine if all CCP AK hazardous waste codes apply or only a subset of codes apply. CCP AK offers a documentation of information that can supplement low level characterization. When AK is determined to be insufficient to completely characterize a waste stream then various methods of sampling and analysis may be employed to complete any knowledge gaps. The Waste Management Division (WM) provides guidance for radiological characterization and the Environmental Protection Division (ENV) provides guidance for RCRA characterization.

Sampling and Analysis

Sampling and Analysis is the most defendable characterization method but may not be practical for various reasons. In addition LANL facility processes are well documented through AK documentation but Sampling and Analysis may be needed for unknown waste items or for unknown properties of a waste item. Sampling and Analysis must be conducted in accordance with Permit Section
2.4.2, *Waste Analysis*, and Attachment C, *Waste Analysis Plan,* of the LANL Hazardous Waste Facility Permit. If sampling and analysis of hazardous or mixed waste is not conducted in accordance with the Permit, the data will be considered as AK, see P409 ENV-RCRA-TOOL-111.

If sampling and analysis is used:

- The methods must be consistent with requirements in permits, regulations (such as the Environmental Protection Agency's SW-846 Manual), the samples must be representative of the waste and must provide confidence that the results describe the entire waste stream. The DQO process is designed to ensure these criteria are met.
- Personnel performing sampling must have an auditable sampling and analysis plan (SAP).

To submit samples or request sampling and analysis, WMCs complete a Request for Analysis. Sampling results are analyzed by the characterization group or WMC to determine appropriate Radiological, RCRA and TSCA components are applied if applicable. See P409 ENV-RCRA-TOOL-111 for guidance on Sampling and Analysis.

Prohibited Item Disposition (PIDs) of TRU Waste Repackaged and Reclassified to Low Level

Prohibited items for the WIPP are removed during the repackaging process of TRU Waste. Prohibited items are placed in a collection drum and then segregated for further processing and radiological assay. Common prohibited items include aerosol cans, fire extinguishers and sealed containers. At the time of PID, the generating organization is to capture as much information as possible to support waste characterization to support AK and final disposition of a PID item. Important information to capture is as follows:

6.2 Waste Characterization, cont.

- Record any chemical information on readable labels and markings on container, i.e. aerosol cans
- Pictures of prohibited item from multiple angles and close-up of labels if feasible
- Does container appear full or empty? Briefly shake container if safe to do so for such common items as aerosol cans if procedure allows
- Record valve integrity for cylinders or fire extinguisher, i.e. removed or intact
- Brief write-up any work performed on PIDs such as valve removal or fluid draining
- Procedure paperwork associated with PID disposition

Waste containers containing PIDs require a new WCATS container label to be generated in accordance with EP-AREAG-WO-1157. Documentation created by the Waste Generator Group concerning PIDs should be uploaded to the newly generated WCATS number by the WMC or designee.

Empty drums generated from the TRU Waste Repackaging Program

Empty drums are generated from TRU waste repackaging activities and reclassified to LLW due to reduced levels of radiological activity on the empty drum. The generator is responsible for providing adequate characterization data to support AK and characterization activities down- stream. Examples of supporting documentation by drum are as follows:

- A form listing empty drums generated, the date of generation forwarded to the POC for Low Level Empty Drums.
- Operation form certifying that each drum is empty upon leaving the repackaging facility along with the date.
- A detailed list of remaining items in the drum such as poly or lead liners, gloves, PPE, job waste, residual solidified sludge, scrap lead and remaining absorbent, etc. *Note – Drums with lead liners or scrap lead must be managed and stored as mixed waste
- Record label, chemical descriptions or container markings of any waste items left in the drum with identifying information

Any information collected above should be entered into WCATS. Documentation can be uploaded to WCATS under the documentation tab of the newly generated low level number in WCATS. At a minimum, copies of the above information are to be forwarded to the Low Level Waste Characterization POC.

6.2 Waste Characterization, cont.

Additional Characterization Methodologies

Additional characterization methodologies to support physical characterization of EP operational waste are performed in order to support AK, verify the waste matrix or verify the absence or presence of prohibited items based on the WAC of the projected off-site TSDF. Examples of additional characterization methods include:

1. Real-Time Radiography (RTR)
2. Visual Inspection/Visual Exam

Real-Time Radiography is performed by the Central Characterization Project (CCP) on suspect Transuranic (TRU) Waste via a certified RTR or fast scan. This is used to verify the waste container matches the LANL AK assigned to the waste, physically identify the waste, confirm the presence or absence of prohibited items and identify RCRA waste items. RTR documentation is often used by the Low Level characterization group on waste packages that have been reclassified to Low Level based on radiological activity. Concerning reclassified low level waste containers, RTR documentation is used by the waste characterization group to determine the appropriate TSDF to handle identified prohibited items.

Visual Exam is performed by visually inspecting the waste and identifying prohibited items that may be present in addition to verifying the waste matrix. Visual Exam is formally documented by a qualified operator and used to support characterization of the waste item. Examples where visual exam is performed include the following:

EP-AREAG-WO-DOP-1084 TA-54 Area G TRU Waste Drum SSSR Activities

EP-AREAG-WO-DOP-1085 TA-54 Area G Sludge Remediation SSSR Activities

EP-AREAG-WO-DOP-1091 TA-54 Area G TRU Oversized Container SSSR Activities

EP-WCRR-WO-DOP-0233 WCRRF Waste Characterization Glovebox Operations

At a minimum a visual inspection of the waste is performed to support characterization of the waste. This is commonly used with bulk industrial or non-free releasable waste where the waste contents are documented in a logbook or hand written list and potentially supplemented with photographs unlike

6.2 Waste Characterization, cont.

official Visual Exam performed to VE procedures. This provides a clear description of the waste and can serve as backup for the intended off-site TSDF.

Weight records are an integral part of the characterization process. Certified weights are used by the low level assay team to ensure the correct net weight is applied to gamma spec or applicable analysis. A certified weight also verifies the correct package weight for shipping and the TSDF. Gross and net weight is commonly documented by an operations weight form or logbook, RTR or assay. Characterization and independent review verifies that the correct net waste weight has been used by NDA and coordinates with the WMC that the correct net weight is documented in WCATS if changes need to be applied.

Using Acceptable Knowledge to Characterize Radioactive Constituents

The following sources of AK may be used to segregate and characterize the radiological components of a waste stream. These methods may use source information, scaling factors, gross radiation measurements, and/or calculations. If the radionuclides used in a controlled area are well known and documented, and if operational controls limit the transfer of material containing other radionuclides into the area, the waste stream generated in this area may be segregated and characterized using source information. Values should be verified and documented periodically.

Scaling factors.
The radiological components of a waste stream may be segregated and characterized by using scaling factors to establish the activity of one radionuclide from the measured activity of another radionuclide. Activities of some radionuclides may be projected using scaling factors based on the amount of other directly measured radionuclides present in the waste stream. Ensure that indirect methods can be correlated with actual measurements. Scaled values should be verified periodically.

Gross radiation measurements.
Gross radiation measurements may be used if there is a correlation between the gross radiation and the radionuclide content of the waste stream. For waste streams with known isotopic data, calculations and measurements are adequate. All calculations and gross radiation measurements must be documented.

Calculations.
When applicable, calculations may be used to identify radionuclides and estimate activities, provided that the computational methods and software used have been verified, validated, and documented. Ensure that the computational methods used to segregate and characterize wastes are described in the waste characterization documentation.

6.2 Waste Characterization, cont.

Using Direct Analytical Data to Characterize the Waste

Direct analytical data is data from samples taken directly from the waste being characterized. See the P409, *Characterization Tools* for guidance on sampling and analysis. The majority of EP Operational Waste is characterized through low level assay either for reclassification from TRU to Low Level or assayed directly as suspect Low Level waste. The resulting Batch Data Report is analyzed by Low Level Characterization to ensure the activity meets the intended TSDF WAC and that the data is captured in WCATS. Results are included in the EP-AREAG-WO-AP-1157 documentation. Other examples but not inclusive of radiological characterization is using baseline background values from environmental monitoring for items that may not be free releasable.

6.3 Waste Packaging and Storage

Utilizing the appropriate waste packaging is an important step by the waste generation group in generating off-site TSDF and DOT compliant waste packages. This step should be addressed in the waste planning process in section 7.1. Planning the appropriate waste packaging before generation minimizes re-work and reduces the risk in generating non-compliant orphan waste. The WAC of the appropriate TSDF should be consulted as to the requirements and acceptable packaging configurations. 49 CFR Part 173 addresses DOT packaging and shipping requirements, compatible waste matrices and activity limits. The scope of shipping operational waste to off-site TSDFs will more than likely be performed through a subcontractor; therefore coordinating with the subcontractor concerning waste packaging and DOT requirements must be considered. The following personnel are available as resources to the generator when in determining the appropriate compliant waste packaging, including but not limited to:

- LANL Transportation Coordinator
- Shipping Subcontractor Technical Representative
- Waste Management Coordinator

Generators will need to plan for each waste package to be verified in the EP-AREAG-WO-AP-1157 verification process. Examples of important items to be submitted by the generator as applicable to waste characterization are as follows:

- Weight form or logbook showing official gross weight and net weight if possible
- Generation paperwork i.e. LLW/MLLW Container Data Sheet or appropriate procedural generating paperwork LTP
- Logbook entries
- Pictures of waste being processed if applicable

LLW and MLLW waste must be stored in a defined area and in accordance with the LANL Hazardous Waste Facility Permit, as applicable. See Procedure EP-DOP-2215 TA-54 *Area G Waste Staging, Loading, and Off-Site Shipment* and the Permit.

6.3 Waste Packaging and Storage, cont.

Waste Container Inspection

The Waste Technical Specialist or designee is responsible for the visual inspection of the container at least weekly for degradation of each waste package. Signs of structural degradation are as follows:

- Significant rust or corrosion
- Container breach, such as split seams, tears, obvious holes, punctures, creases, broken welds, or cracks
- Dents, scrapes, and scratches that might compromise structural integrity
- Evidence of leakage
- Evidence of bulging
- Tears in plastic sheeting/covering
- Improper labeling

Waste packages are also inspected to meet DOT requirements by shipping personnel prior to shipment see procedure EP-DOP-2215.

6.4 Waste Documentation

The generating organization is responsible for waste documentation on a container basis. Pertinent information in relation to the waste package should be entered into WCATS at the point of generation and the creation of a new waste number in WCATS. In addition, waste documentation should be forwarded to the Low Level POC. Examples of documentation though not all inclusive include:

- LTP LLW/MLLW Container Data Sheet
- Container information from procedure paperwork from TRU repackaging and oversized box line processes
- Hazardous RCRA constituents
- Logbook entries pertaining to waste container contents
- Pictures taken of waste if applicable
- Beryllium (Be) Survey Data for Be operations
- Weight Record
- Any applicable information to assist later in the waste characterization process

The characterization and verification package on each waste container is documented in the EP-AREAG-WO-AP-1157 waste package. This includes Attachments 1 & 2 along with supporting documentation. The waste package is uploaded into the WCATS database in addition to being uploaded to the LANL SharePoint® system by the Waste Control Specialist or Designee. The waste package is a Quality Assurance (QA) Record. See procedure AREAG-WO-AP-1157.

6.4 Waste Documentation, cont.

[1] Disposition records in accordance with the following:

Record Identification	Record Type Determination	Protection/Storage Method	Processing Instructions
Attachment 1, LTP LLW/MLLW Final Container Verification Data Sheet Attachment 2, LTP LLW/MLLW Container Information Data Sheet	Quality Assurance (QA) Record	Records **SHALL** have a reasonable level of protection to prevent loss and degradation. Records **SHALL** be maintained in a one hour fire-rated metal file cabinet when not in use.	When the records are ready for final disposition, the record is transferred to Records Management in accordance with EP-DIR-AP-10003, Records Management Procedure for ADEP Employees.

6.5 Waste Disposition and Shipping

Shipping for EP operational waste to off-site TSDFs will be performed by a subcontractor. Off-site shipment of chemical, hazardous or radioactive waste is performed via procedure P930-3. TA-54 Area G Waste staging, loading, and off-site shipment is performed via EP-DOP-2215.

The Waste Technical Specialists acquires signatures for the characterization and verification paperwork from procedure EP-AREAG-WO-AP-1157. The Waste Management Coordinator (WMC) submits WCATS WDR for approval *DOT approved shippers create Bill of Lading or Manifest for off-site TSDF disposal*

- WDP serves as POC for all off-site chem-haz, radioactive, and mixed waste shipments

7. RECORDS MANAGEMENT

Submit the following records generated by this procedure to the Records Processing Facility in accordance with EP-DIR-AP-10003, *Records Management Procedure for ADEP Employees*:

- WCSFs and Amendments to WCSFs,

7. Records Management, cont.

- Related waste management documentation and supporting information (e.g., training, inspection, site registration, waste inventory),
- WPFs and supporting documentation,
- Miscellaneous waste documentation (e.g., IWD, RWP), and
- Waste disposition documentation (e.g., WDR, manifests, Bills of Lading).

NOTE: *For both WCSFs and amendments to WCSFs, the submittals to the RPF must be in final form (i.e., with all signatures by the appropriate reviewers) and must include all attachments (e.g., AK documentation, data summaries, figures, etc.).*

8. ATTACHMENTS

Attachment1 - LA-UR 10-01457, *Waste Characterization Strategy Form Preparation Guidance*

ATTACHMENT 1

LA-UR 10-01457

WASTE CHARACTERIZATION STRATEGY FORM
PREPARATION GUIDANCE
March 2010

WCSFs for Environmental Program (ADEP) projects will be prepared in accordance with the following guidance.

PREPARATON OF ADEP PROJECT WCSFS:

Prior to preparing the WCSF:

- Identify all waste streams that are anticipated to be generated by the project.
- Identify waste requirements (e.g., analytical suites, conditions for return of environmental media) specified in work plans, closure plans, or other approved work documents.
- Review available data and source information for the planned work sites to determine how to initially manage wastes (e.g., hazardous, non-hazardous, asbestos, low-level waste (LLW), etc.). Reference appropriate documents and data that support the initial handling decisions in the WCSF.
- Determine whether existing data meets the requirements for acceptable knowledge (AK), as specified in P409, *Waste Management Requirements* and P930-1, *Los Alamos National Laboratory* (*LANL) Waste Acceptance Criteria*. If there is some useful information based on AK, develop a strategy for sampling and analysis that will complete the characterization for the waste stream. If there is no useful information, develop a strategy for sampling and analysis that will identify and quantify chemicals of potential concern needed to make a waste determination in the waste stream.
- Review the most recent waste acceptance criteria (WAC) requirements for potential receiving facilities to ensure that analytical suites identified in the Characterization Table (see Attachment 1) in the WCSF meet the receiving facilities' requirements.
- If the waste is a category that can be land applied (drilling fluids, purge water, development water, or drill cuttings), review the land application procedures (to ensure that the analytical suites identified in the WCSF are appropriate for land application.

Meet with the Environmental Protection (ENV-RCRA) representative to discuss the waste streams and obtain a recent example of a completed WCSF. Use the template in Attachment 1 to prepare the WCSF (unless the ENV-RCRA representative approves a different format).

Obtain a document number from the project Subcontract Technical Representative or LANL Waste Management coordinator (WMC) and enter it and the WCSF title into the footer section of the WCSF. Provide the following information:

General information:

- Identify the area that the project will impact. If solid waste management units (SWMUs) or Areas of Concern (AOCs) will be impacted, list them in this section.
- Identify the activity type (e.g., decontamination and decommissioning (D&D), well drilling, remediation, investigation, or corrective measures implementation).
- Provide the name of the LANL waste generator or Project Manager.
- List the LANL WMC, the author of the WCSF, and other appropriate personnel.
- Provide the date the WCSF was drafted.

Description of activity: Provide a brief description of the purpose of the Project and the types of wastes expected to be generated.

Relevant Site History and Description: Provide a brief description of investigations, remediation, or corrective measures implementation activities that have occurred to date. If data from previous investigations are adequate to justify that waste be initially handled as non-hazardous, provide a brief justification for each affected potential release site. If adequate data are not available, a written "due diligence" review of available documentation of the sources of contaminants at the site may be prepared and used as justification for initial handling of the waste.

Characterization Strategy: The first few paragraphs of this section will be standard language provided by ENV. The standard language provides general information on how waste and samples will be managed.

Waste Type: Provide a description of each anticipated waste stream and the expected quantities of each waste. For each waste type identify:

- **Anticipated Regulatory Status:** Identify whether each waste stream is expected to be solid, industrial, hazardous, radioactive, mixed, polychlorinated biphenyls (PCBs), New Mexico Special Waste (NMSW), etc.).
- **Characterization Approach:** Describe how each waste will be characterized (e.g., direct sampling, use of investigation data, use of AK, or a combination of these methods). If waste is to be directly sampled, specify when waste will be sampled (generally within 10 days of generation unless the waste is generated in an area of contamination or initially stored in a drilling pit) and the turnaround time for analysis (generally $\leq$ 21-days) Identify the procedures that will be used to collect samples. Or, the sampling approach can be included as a separate section under each waste type. A list of LANL sampling procedures is included in Table 1 and others may be available. Equivalent, LANL-approved Subcontractor procedures may be used.

- **Storage and Disposal Method:** Describe how each waste will be stored (e.g., containerized, stockpiles with controls), how the waste will initially be managed (e.g., hazardous, non-hazardous, NMSW, LLW, etc.), and the anticipated disposal method (e.g., land application, on-site treatment at Clean Water Act permitted facilities, disposal of LLW at TA-54 Area G, or treatment and/or disposal off-site).

Characterization Table: Complete the characterization table at the end of the WCSF for each waste stream.

Note: *If data are insufficient to make a definitive regulatory classification at the time of WCSF completion, more than one box on the characterization table may be checked, along with an explanation in the text section. The final regulatory classification will be reflected on the WPF. Ensure that the table identifies the suite of analyses required based on site knowledge, information needed by the anticipated receiving facility, or for land application, if applicable.*

After the WCSF is drafted, submit it through the proper channels (e.g., records management) for review and comment. Incorporate comments and obtain signatures.

When a correction to the approved form is necessary, complete Attachment 2, WCSF Amendment Form. Obtain a document number from the project Subcontract Technical Representative or LANL Waste Management coordinator (WMC) and enter it and the WCSF title into the footer section of the WCSF. Ensure the information on Attachment 2 addresses the following:

- The original WCSF title and document number must be in the amendment heading for ease of reference;
- The Reason for Amendment provides the reason for the amendment (e.g., new waste stream not included in the original WCSF or change in the method of management) and provides details on the change(s) necessitating the amendment;
- The Waste Description provides a description of the waste that is the subject of the amendment and the activity generating the waste; and
- Characterization, Management, and Disposal provides a description of how the waste will be characterized and managed, and the anticipated method(s) of storage, treatment, or disposal. If the Characterization Table in the WCSF does not address the waste covered in the Amendment, attach a Characterization Table with the new information to the Amendment.

After the WCSF is drafted, submit it through proper channels (e.g., records management) for review and comment. Incorporate comments and obtain signatures

Table 1. LANL SAMPLING AND ANALYSIS PROCEDURES

Procedure Number	Title
EP-ERSS-SOP-5056	Sample Containers and Preservation
EP-ERSS-SOP-5057	Handling, Packaging, and Transporting Field Samples
EP-ERSS-SOP-5058	Sample Control and Field Documentation
EP-ERSS-SOP-5060	Operational Guidelines for Taking Soils and Water Samples in Explosive Areas
EP-ERSS-SOP-5061	Field Decontamination of Equipment.

Reference	
EP-ERSS-SOP-5181	Documentation for Waste and Environmental Services Technical Field Activities
P 121	Radiation Protection
SOP-06.09	Spade and Scoop Method for Collection of Soil Samples
SOP-6.10	Hand auger and Thin-Wall Tube Sampler
EP-DIV-SOP-20014	Coliwasa Sampler for Liquids and Slurries.
EP-DIV-SOP-20015	Weighted Bottle Sampler for Liquids and Slurries in Tanks
EP-ERSS-SOP-5059	Field Quality Control Samples
SOP-5139	Sampling Soil and Vegetation at Facility Sites
SOP-5194	Chip Sampling of Porous Surfaces

ATTACHMENT 1	
Waste Characterization Strategy Form (WCSF)	Records Use only

Area of Impact (including Solid Waste Management Unit(s) or Area(s)	
Activity Type:	
Project Manager/ Waste Generator:	
LANL Waste Management Coordinator	
Completed By:	
Date:	
Description of Activity:	
Relevant Site History and Description:	
Characterization Strategy: • Waste #1: *Anticipated Regulatory Status*, *Characterization Approach, Storage and Disposal Method* • Waste #2: *Anticipated Regulatory Status*, *Characterization Approach, Storage and Disposal Method* • Etc.	

CHARACTERIZATION TABLE				
Waste Description	**Waste # 1**	**Waste #2**	**Waste #3**	**Waste #4**
Estimated Volume				
Packaging				
Regulatory classification:				
Radioactive Waste				
Municipal Solid Waste (MSW)				
Waste destined for LANL's SWWS or RLWTF[1]				
Hazardous Waste				
Mixed (hazardous and radioactive) Waste				
Polychlorinated Biphenyls-Contaminated Waste (PCBs)				
New Mexico Special Waste				
Industrial Waste				
Characterization Method				
Acceptable knowledge (AK): Existing Data/Documentation				
AK: Site Characterization				
Direct Sampling of Waste				
Analytical Testing				
Volatile Organic Compounds (VOCs) (EPA 8260-B)				
Semivolatile Organic Compounds (SVOCs) (EPA 8270-C)				
Organic Pesticides (EPA 8081-A)				
Organic Herbicides (EPA 8151-A)				
PCBs (EPA 8082)				
Total Metals (EPA 6010-B/7471-A or EPA 6020)				
Total Cyanide (EPA 9012-A)				
High Explosives Constituents (EPA 8330/8321-A)				
Asbestos (EPA 600M4)				
Total petroleum hydrocarbon (TPH)-GRO (EPA 8015-M)				
TPH-DRO (EPA 8015-M)				
Toxicity characteristic leaching procedure (TCLP) Metals (EPA 1311/6010-B)				
TCLP Organics (EPA 1311/8260-B & 1311/8270-C)				
TCLP Pest. & Herb. (EPA 1311/8081-A/1311/8151-A)				
Gross Alpha (alpha counting) (EPA 900)				
Gross Beta (beta counting) (EPA 900)				
Tritium (liquid scintillation) (EPA 906.0)				
Gamma spectroscopy (EPA 901.1)				
Isotopic plutonium (HASL-300)				
Isotopic uranium (HASL-300)				
Total uranium (EPA 6020)				
Strontium-90 (EPA 905)				
Americium-241 (HASL-300)				
Perchlorates (EPA 6850)				
Nitrates/Nitrites (EPA 300.09-soil or 343.2-water)				
Oil / Grease (EPA 1665)				
Fluorine, Chorine, Sulfate (EPA 300)				
TTO (EPA 8260-B and EPA 8270-C)[2]	**Request VOCs and SVOCs above**			
Total Suspended & Dissolved Solids (TSS) and Total Dissolved Solids (TDS) (EPA 160.1 and 160.2)				
Chemical Oxygen Demand (COD) (EPA 410.4)				
pH (EPA 904c)				
Microtox or Biological Oxygen Demand (BOD)[3]				

Characterization Table (Cont'd)

[1]in addition to other analytes needed to characterize the waste (e.g., VOC, SVOC, total metals), analyze for TSS, TDS, Oil and Grease, gross alpha, gross beta, tritium, and pH for liquids destined for the LANL sanitary waste water system (SWWS). For wastes destined for the RLWTF additional constituents include TTO,TSS, COD, pH, total nitrates/nitrites, and gross alpha, gross beta (not including tritium), and gross gamma **or** the sum of individual alpha-, beta-, and gamma-emitting nuclides.

[2]TTO is the total of volatile organic and semi-volatile organic compound contaminants. Request methods EPA 8260-B (VOCs) and EPA 8270-C (SVOCs).

[3] If Microtox analysis is not available, request BOD.

Signatures	**Date**
Project Manager (Print name and then sign below.)	
Preparer (Print name and then sign below.)	
Waste Management Coordinator (Print name and then sign below.)	
ENV-RCRA Representative (Print name and then sign below.)	
Waste Acceptance Representative (Print name and then sign below.)	
Waste Certification Program Representative (only if radioactive wastes will be generated (Print name and then sign below.)	

ATTACHMENT 2	
Amendment to the WCSF **Title:**	Records Use only Los Alamos NATIONAL LABORATORY EST.1943
Reason for Change	
Waste Description:	
Characterization, Management, and Disposal:	

Signatures	**Date**
Project Manager (Print name and then sign below.)	
Preparer (Print name and then sign below.)	
Waste Management Coordinator (Print name and then sign below.)	
ENV-RCRA Representative (Print name and then sign below.)	
Waste Acceptance Representative (Print name and then sign below.)	
Waste Certification Program Representative (only if radioactive wastes will be generated) (Print name and then sign below.)	

	Los Alamos National Laboratory