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Environment, Safety, Health Directorate

Administrative Procedure

Waste Characterization

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1.0 INTRODUCTION

The purpose of this document is to provide requirements for Waste Characterization. This document is managed and owned by the Associate Directorate Environment, Safety and Health and provides instructions on the applicability of the requirement.

1.1 Purpose

This document summarizes the requirements in 40 CFR 262.11 (hazardous waste determination), 40 CFR 261.20(c), Appendix I (representative samples) of 40 CFR 261, 40 CFR 264.13.b and Attachment C of LANL's Hazardous Waste Facility Permit (Waste Analysis Plan).

1.2 Scope

This document applies to any LANL employee, contractor, or sub-contractor who has been identified as a waste generator.

Note: Treatment and Storage Facility (TSF) workers become "Waste Generators" when activities at the TSF (e.g., repackaging, sorting, and segregation) lead to the generation of regulated waste or trigger re-characterization of the waste stream as described within this section.

2.0 PRECAUTIONS AND LIMITATIONS

This document cannot establish new requirements; it may only summarize the requirements in federal or state statutes/regulations/permits, DOE Orders, and authorized Laboratory policies.

3.0 WASTE CHARACTERIZATION DESCRIPTION

Waste must be characterized by using direct sampling and analysis of the waste, acceptable knowledge (AK), or a combination of the two methods.

The characterization method must be defined for the type of waste and be in accordance with the receiving facility's waste acceptance criteria.

Note: The characterization must demonstrate chemical stability and compatibility to ensure that the waste, once generated, will not create an unwanted reaction (i.e. harmful gasses, vapors, liquids, explosive conditions, etc.).

3.1 Acceptable Knowledge

Acceptable Knowledge (AK) is a method used by the waste generator to document characterization of wastes in lieu of approved sampling and analysis. Sampling and analysis by approved methods is the most defensible means of waste characterization; however, AK may be substituted for analytical data if complete and properly documented.

3.2 Sources and Examples of AK

Examples of AK documentation used at the Laboratory may include, but are not limited to, the following:

- Process design documents.
- Final safety analysis reports (SARs), unreviewed safety questionnaire determinations (USQDs), and technical safety requirements (TSRs).
- Standard Operating Procedures (SOPs), Hazard Control Plans (HCPs), Activity Hazard Analysis (AHAs), and/or Detailed Operating Procedures (DOPs).
- Other documented knowledge of processes that lists raw materials or reagents, describe the process/experiment which uses the materials, and describe how the waste streams are generated and handled.

  Examples of this type of AK:

  Waste streams that are highly similar to previously characterized waste streams **if** the differences in the proposed generating process are well understood and documented and the nature of the waste stream from the proposed process can be predicted with a high level of confidence and the previously characterized waste stream is itself well characterized via data/AK.

  Waste streams that contain hazardous constituents from specific, well-documented processes such as Resource Conservation and Recovery Act (RCRA) K-listed waste generating process.

  Generator/ SME clarification or characterization statements, e.g., statement that waste with residual explosive material is non-explosive, therefore non-RCRA-reactive although associated with a High Explosive (HE) process.

  Note: Integrated Work Documents (IWDs) regularly cover a facility or number of processes, and are typically too broad and general to provide specific process descriptions and waste descriptions.
- 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.

  Note: AK documents that cannot be attached entirely to the Waste Stream Profile in WCATS must be traceable and specifically referenced under the profile.

  Note: Applicable log book pages or excerpts may be attached to Waste Disposal Requests in lieu of attaching to the WSP record. However, it should be noted in the WSP if this practice is to be used.
- Site databases (e.g., chemical inventory database for Superfund Amendments and Reauthorization Act [SARA] Title III).
- Documented site personnel interview information.

- Correspondence such as memoranda, letters, telephone logs.
- Previous analytical data relevant to the waste stream, such as fingerprint analysis, spot-check procedures, or routine waste stream verification sampling and analysis data.
- Safety Data Sheets/Material Safety Data Sheets (MSDSs), product labels, and other product packaging information, particularly for trade-name or proprietary products (e.g., "WD-40");

  Example of this type of AK:

  Waste streams consisting of discarded commercial chemical products, reagents, or chemicals of known physical and chemical composition (e.g., RCRA P-listed and U-listed wastes).
- 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).

  Example of this type of AK:

  Characterizing waste streams that contain heterogeneous materials, where the physical nature of the waste stream does not lend itself to taking a representative sample (e.g., laboratory PPE).
- Documentation that demonstrates that surrogate materials accurately reflect the characteristics of the waste stream in question.

3.3 AK Documentation

AK should include, at a minimum:

- A description of the waste generating process, to include:
  - A general description of physical/chemical process(s) generating the waste;
  - What materials or inputs are used in the process(s); and
  - How are the materials/reagents used (i.e., are organics used for their solvent properties, or as ingredients).
- A physical, chemical, and regulatory description of the waste produced.
- A basis for how the waste constituents and contaminants are identified and bounded (e.g., how their min-max ranges are determined).
- A description of the process controls that are in place to ensure generated waste remains within the bounds of the waste stream profile (WSP).

Ensure the AK documentation is relevant and traceable to a waste stream and not merely a list of information sources for a particular process operation. Document information that is accurate, sufficient, current (i.e., updated), and relevant to the waste stream's generation, characterization, and management.

Consider including the following information for each waste stream, or related waste stream:

- The specific location of the waste-generating process/operation.
- The time period of generation.
- The person or persons responsible for the process operations and for waste management, including organization and point of contact information (i.e., the Waste Management Coordinator [WMC]).

Any assumptions made should be identified and documented.

3.4 Sampling and Analysis

Sampling and analysis must be conducted in accordance with the Hazardous Waste Permit Section 2.4.2. If sampling and analysis is not conducted in accordance with Section 2.4.2, the data will be considered acceptable knowledge.

- If sampling and analysis is used:
  - The methods must be consistent with requirements in permits and 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 a sampling and analysis plan (SAP).
  - Sampling may be used to confirm, supplement, or bound AK (e.g., pH testing to confirm pH range, or Toxicity Characteristic metals analysis to determine ranges of known contaminants).

To submit samples or request sampling and analysis, WMCs must complete a Request for Analysis. WM-SVS sampling and analysis subject matter experts can provide guidance in designing a sampling plan for non-homogeneous wastes. Such wastes can include—but are not limited to—decontamination and demolition debris, construction debris, excavation debris, and concrete rubble from interior remodeling projects.

3.5 LANL's Waste Analysis Plan

Waste streams designated for transfer to permitted on-site storage areas may require characterization—which is specified in one of the three bullets below. Contact Luciana Vigil-Holterman at 5-3435 for assistance.

Attachment C to LANL's Hazardous Waste Permit is the Waste Analysis Plan (WAP) which includes the following three tables for appropriate characterization methods:

- Table C-16 provides the appropriate characterization methods for hazardous waste.
- Table C-17 provides the appropriate characterization methods for mixed low level waste.

- Table C-18 provides the appropriate characterization methods for mixed transuranic waste.

The LANL WAP from the Hazardous Waste Permit issued November 2010 will be used by all generators except for the Interim Status Units. The Interim Status Units will use the WAP from the most recent application.

3.6 Re-characterization of Waste Stream

Waste Generators must update waste characterization based on the following:

- after an annual re-evaluation, if there is any change to the waste;
- there is a change to the waste-generating processes or operations;
- analytical results indicate a change in the waste stream;
- new characterization information becomes available;
- a waste container is opened and secondary material is added to the container;
- waste is repackaged and secondary material is added during this process;
- there is a change in the ownership of a WSP; or
- the Waste Generator is notified that waste received at an off-site facility does not match a pre-approved waste analysis certification or accompanying shipping documentation.

The Waste Generators must contact the WM-DO in the event it is required to update waste characterization information described above. WM-DO will work through appropriate subject matter experts to assess the identified changes in the waste characterization and recommend actions.

3.7 Re-characterization at Treatment and Storage Facilities

Under the LANL Hazardous Waste Facility Permit, TSFs must update their waste characterization when the following occurs:

- a Waste Generator determines one or more of the above conditions in Section 3.6 has occurred;
- TSF workers have reason to believe that the process or operation generating the waste has changed;
- waste is repackaged and no longer matches the characterization in its WSP (e.g. changed matrix; different EPA Hazardous Waste Numbers);
- waste is repackaged and secondary material is added during this process;
- annual notification of AK waste streams indicates the waste does not match the waste

specified by the waste generator;

- waste received at an off-site facility does not match a pre-approved waste analysis certification or accompanying shipping documentation; or
- an inspection reveals that the waste does not match the identity of the waste specified by the Waste Generator or a manifest on a shipping paper.

4.0 COMPATIBILITY

See ADESH-AP-TOOL-115 for guidance.

5.0 EXCEPTIONS

N/A

6.0 DEFINITIONS AND ACRONYMS

See LANL *Definition of Terms*.

See LANL Acronym Master List.

7.0 RECORDS

Records generated by this document will be submitted for records management in accordance with P1020-1, *Laboratory Records Management* and if applicable, with the ADESH-AP-006, *Records Management Plan*.

- WSPs and supporting documentation will be maintained in WCATs. When security prohibits inclusion of this documentation, a unique identifier will be used.

8.0 REFERENCES

40 CFR Section 260 through 264

P409, “LANL Waste Management”

LANL Hazardous Waste Facility Permit

9.0 ATTACHMENTS OR APPENDICES

N/A