

ATTACHMENT F4

WASTE CHARACTERIZATION USING ACCEPTABLE KNOWLEDGE

F4-1 Introduction

Generators of solid waste are required by New Mexico Hazardous Waste Management Regulations in Title 20 New Mexico Administrative Code, Chapter 4, Part 1, Subpart 300 (20.4.1.300 NMAC), incorporating 40 CFR 262.11, to determine if the waste is a listed or characteristic hazardous waste, either by analyzing the waste or by applying knowledge of the waste in light of the materials or process used. The New Mexico Environment Department's (NMED) preferred method to meet waste analysis requirements is to conduct sampling and laboratory analysis because it is more accurate and defensible than other options. However, 40 CFR Parts 260 through 265, 268, and 270, and the Subparts I through VI, Subpart VIII, and Subpart IX, authorize the use of acceptable knowledge (AK) in appropriate circumstances by waste generators, or treatment, storage, or disposal facilities to characterize hazardous waste.

AK is described in *Waste Analysis: EPA Guidance Manual for Facilities That Generate, Treat, Store and Dispose of Hazardous Waste* (EPA, 1994). AK, as an alternative to sampling and analysis, can be used to meet all or part of the waste characterization requirements under the RCRA (EPA, 1994).

AK includes a number of techniques used to characterize waste, such as process knowledge, records of analysis acquired prior to RCRA, and other supplemental sampling and analysis data (EPA, 1994). Process knowledge includes information regarding the physical form of the waste, the base materials composing the waste, and the process that generates the waste. Examples of supplemental sampling and analysis data are provided in Section F4-2c.

AK is used in waste characterization activities in the following ways:

- To identify hazardous constituents in wastes from specific processes, such as F-listed and K-listed wastes identified at 20.4.1.200 NMAC (incorporating 40 CFR ' 261.31)
- As the sole characterization for wastes that are unused commercial chemical products or reagents, such as several of the P-listed and U-listed wastes identified at 20.4.1.200 NMAC (incorporating 40 CFR ' 261.33)
- To assess if underlying hazardous constituents exist in wastes that are determined to be characteristically hazardous (20.4.1.800 NMAC, incorporating 40 CFR ' 268.9).
- To assess waste characteristics when the physical nature of the waste does not lend itself to taking a laboratory sample, such as heterogeneous debris wastes exhibiting a toxicity characteristic (20.4.1.200 NMAC, incorporating 40 CFR ' 261.24)

- To delineate waste streams

F4-1a Permit-Specific Waste Characterization Requirements and the Use of Acceptable Knowledge

Permit Attachment 4, Section 4.3.1, specifies waste characterization information that must be provided by the waste generator, including but not limited to “waste analysis data used to characterize the waste and/or process knowledge documentation”. Section 4.3.1 also states that waste analysis requirements may sometimes be met by providing “acceptable knowledge” documentation. As such, the Permit specifies that generator sites may choose to use acceptable knowledge in lieu of sampling to obtain waste characterization information.

In a March 18, 2002 Final Order issuing the Permit, the Secretary of Environment Department (**Secretary**) required that for wastes received from foreign generators, the Permittee require additional information and verify that information through increased auditing. To comply with the Secretary’s Order, all foreign waste streams shall undergo the applicable provisions of this AK process prior to management at Triassic Park. The Permittee shall obtain AK documentation from each waste generator for each waste stream as specified in Section F4-2. And the Permittee shall assess generator’s collection and use of AK documentation during audits as specified in Section F4-5.

Permit Attachment F, Section 4.3.1 also specifies that representative samples must also be collected for each waste stream in addition to waste analysis information. The Permit also requires fingerprint analysis at Triassic Park (**Facility**). The Permittee may not accept AK waste characterization information as a substitute for representative sampling (except in the case of debris waste as specified in section 4.4.2) or in lieu of performing on-site fingerprint analysis.

F4-2 AK Documentation

The following Sections include the information the Permittee will require from each foreign generator to characterize waste using AK. The required AK information must be supported by additional information (see Section F4-2c, Supporting AK Information).

If the required information is not available for a particular waste (e.g., a drum of unlabeled waste), the Permittee shall require the generator to obtain supplemental data (e.g., sampling/analysis data) to augment existing AK, but must petition the Secretary for a determination whether sufficient waste characterization documentation exists in the form of AK documentation and supplemental analytical data, or the waste will not be accepted for storage, treatment, or disposal at the Facility. NMED will evaluate whether sufficient documentation exists to justify all missing hazardous waste codes.

All specific, relevant AK documentation, including supporting AK documentation, assembled and used in the AK process, whether it supports or contradicts any required AK documentation, shall be identified by the generator and an explanation provided for its use (e.g., identification of a toxicity characteristic) in an Acceptable Knowledge Waste Characterization Documentation Summary.

F4-2a Required Generator Waste Management Program Information

Generator waste management program information shall describe how waste intended for management at the Facility is generated, tracked, and managed at the generator facility. The following information shall be included as part of the AK written record:

1. Map of the generator facility with the areas involved in waste generation and treatment identified
2. Identification of waste(s) intended for management at the Facility
3. Description of the operations that generate the above identified waste(s)
4. Waste identification or categorization schemes used at the facility
5. Quantities of waste(s) generated
6. Identity of the person(s) responsible for compliance with administrative controls of wastes

The generator must obtain this information through implementation of written procedures (perhaps provided by the Permittee) that address, at a minimum:

- Procedures for delineating waste stream(s)
- Procedures to identify hazardous waste(s) and assign the appropriate hazardous waste code(s) to each waste stream. The following are minimum baseline requirements/standards that procedures shall include to ensure comparable and consistent characterization of hazardous waste:
 - Review the required information to determine if the waste is listed under 20.4.1.200 NMAC (incorporating 40 CFR ' 261, Subpart D). Assign all appropriate and applicable listed hazardous waste codes unless the generator chooses to justify an alternative assignment and document the justification.
 - Review the required information to determine if the waste may contain hazardous constituents included in the toxicity characteristics specified in 20.4.1.200 NMAC (incorporating 40 CFR ' 261, Subpart C). If a toxicity characteristic constituent is identified and is not included as a listed waste, assign the toxicity characteristic code unless appropriate AK documentation or supplemental analytical data are available that demonstrate that the concentration of the constituent in the waste is less than the toxicity characteristic regulatory level. When analytical data are not available, the toxicity characteristic hazardous waste code for the identified hazardous constituent shall be applied to the waste stream.

- Review the required information to determine if the waste may exhibit ignitable, reactive or corrosive hazardous characteristics specified in 20.4.1.200 NMAC (incorporating 40 CFR ' 261, Subpart C). Without appropriate AK documentation or supplemental analytical data, the ignitable, reactive and corrosive characteristic hazardous waste codes shall be applied to the waste stream.
 - If the waste stream is identified as characteristically hazardous, review the required information to identify underlying hazardous constituents as required by 20.4.1.800 NMAC (incorporating 40 CFR ' 268.9)
- Procedures the generator will use to ensure prohibited wastes are not present in each container of waste (e.g., see Permit Condition 2.4.2, *Prohibited Waste Streams*)
 - Procedures for assigning the appropriate physical waste form of the waste(s)
 - Procedures to document how changes to waste stream assignment and associated EPA hazardous waste numbers based on material composition are documented for any waste
 - Procedures for waste certification to be sent to the Facility
 - Procedures for resolving inconsistencies in AK documentation

F4-2b Required Generator Waste Stream Information

For each waste stream, the Permittee shall require generators to compile all data used to characterize that waste stream. The type and quantity of documentation will vary by waste stream, depending on the process generating the waste. At a minimum, the waste stream information shall include the following written information:

1. Area(s) and/or building(s) from which the waste stream was or is generated
2. Material inputs or other information that identifies the chemical content of the waste stream and the physical waste form
3. Waste generating process described for each waste stream
4. Waste stream volume and time period of generation
5. Waste process flow diagrams (e.g., a diagram illustrating how the waste stream moves from a specific building to a size reduction facility to a container storage area)

Assumptions made in delineating each waste stream also shall be identified and justified. If discrepancies exist between required information, then generators shall apply all hazardous waste codes indicated by the information to the subject waste stream unless the generators choose to justify an alternative assignment and document the justification.

F4-2c AK Supporting Information

Generators shall make all AK supporting information part of the AK documentation. The amount and type of supporting information is generator-specific and cannot be mandated, but generators shall collect information as appropriate to support required information. The Permittee shall assess adequacy of supporting information during audits (Section B4-3f). AK supporting documentation includes, but is not limited to, the following:

- Process design documents
- Preliminary and final safety analysis reports and technical safety requirements
- Waste packaging logs
- Test plans or research project reports that describe reagents and other raw materials used in experiments
- Generator databases (e.g., chemical inventory database)
- Information from generator personnel (e.g., documented interviews)
- Standard industry documents (e.g., vendor information)
- Analytical data relevant to the waste stream, including results from representative sample analysis, fingerprint analyses, spot checks, or routine verification sampling.
- Material Safety Data Sheets, product labels, or other product package information
- Sampling and analysis data from comparable or surrogate waste streams
- Laboratory notebooks that detail the research processes and raw materials used in an experiment

Supporting documentation may be used to further document the rationale for the hazardous characterization results. Similar to required information, if discrepancies exist between supporting information and the required information, generators shall apply all hazardous waste codes indicated by the supporting information to the subject waste stream unless the generators choose to justify an alternative assignment and document the justification.

F4-3 Qualifications and Training Requirements

Generator personnel responsible for compiling AK, assessing AK, and resolving discrepancies associated with AK shall be qualified and trained in the following areas at a minimum:

- New Mexico and U.S. Federal RCRA regulations associated with solid and hazardous waste characterization
- WAP requirements as specified in Permit Part 2, Permit Conditions 2.3.1, 2.4.2, 2.5.2, and 2.5.3; Permit Attachment F, Sections 4.3 and 4.4; and Permit Attachment F4.

F4-4 AK Data Quality Requirements

Permittee shall require generators to comply with the following data quality requirements for AK documentation:

- Accuracy - Accuracy is the degree of agreement between an observed sample result and the true value. The percentage of waste containers that require re-designation of hazardous waste codes based on representative sampling and analysis data will be determined as a measure of AK accuracy.
- Completeness - The AK record shall contain 100 percent of the information specified in Section F4-2. The usability of the AK information will be assessed for completeness during audits.
- Comparability - Data are considered comparable when one set of data can be compared to another set of data. Comparability is ensured through generators meeting the training requirements and complying with the minimum standards outlined for procedures that are used to implement the AK process.
- Representativeness - Representativeness expresses the degree to which sample data accurately and precisely represent characteristics of a population. Representativeness is a qualitative parameter that will be satisfied by ensuring that the process of obtaining, evaluating, and documenting AK information is performed in accordance with the minimum standards established in Section F4-2. Generators also shall assess and document the limitations of the AK information used to assign hazardous waste codes (e.g., purpose and scope of information, date of publication, type and extent to which waste parameters are addressed and limitations of information in identifying hazardous wastes).

F4-5 Audits of AK

The Permittee will conduct document audits to verify compliance with the compilation, application, and interpretation requirements of AK information specified in this Section at all foreign generator facilities. This audit does not require the Permittee visit foreign generator facilities. The audit will evaluate the completeness and defensibility of generator-specific AK documentation related to hazardous waste characterization. The audit will result in a Waste Steam Audit Report to be maintained in the Facility's Operating Record.

Members of the Permittee's audit team will be knowledgeable regarding the WAP-required AK information and RCRA hazardous waste characterization. Audit team members will be independent of all waste management operations at the foreign generator being audited.

The Permittee will conduct an audit of each foreign generator prior to allowing waste transport to the Facility. This initial audit will establish an approved baseline that will be reassessed annually by the Permittee. Generator waste management programs and waste stream-specific audit checklists identifying all required documentation will be developed, used and evaluated by the Permittee prior to acceptance of a waste stream. Auditors will assess AK for correlation to specific waste streams, evaluate the generator process of compiling AK documentation; assigning hazardous waste codes; and identifying, resolving, and documenting discrepancies in AK records. Auditors will review documentation for logic, completeness, and defensibility, clarity of presentation, and degree of compliance with this Permit Attachment. Auditors shall ensure that generators appropriately include all potential hazardous waste codes indicated by the AK records. Any deficiencies in procedures shall be documented in the Waste Stream Audit Report.

A Waste Stream Audit Report will be completed and maintained the Facility's Operating Record. The Audit Report will include all observations and findings identified during the audit. The Audit Report will be provided to the Generator and the Generator shall respond to all audit findings and identify corrective actions. If the required AK information is not available, the Permittee will not manage the waste for the subject waste stream. Permittee's acceptance of the subject waste stream will not resume until the Permittee determines that the generator complies with all applicable requirements of the WAP.

F4-6 AK Re-evaluation and Corrective Action

The Permittee shall require generators to establish procedures for reevaluating AK if representative waste sampling and analysis results in the assignment of a different hazardous waste code. Generator procedures shall describe how AK is reevaluated and how appropriate hazardous waste codes are assigned. If a waste must be assigned to a different waste code, the following minimum steps shall be taken to reevaluate AK:

- Review existing information based on the container identification number and document all differences in hazardous waste code assignments
- If differences exist in the hazardous waste codes that were assigned, reassess and document all required AK information (Section B4-3b) associated with the new designation
- Reassess and document all sampling and analytical data associated with the waste
- Verify and document that the process material inputs are consistent with the waste characterization
- Define the actions necessary to fully characterize the waste