

TP 2002

02-029

**Steve Pullen**

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**From:** Pete Domenici [Domenici@dolan-domenici.com]  
**Sent:** Friday, April 05, 2002 1:27 PM  
**To:** 'Steve Pullen@nmenv.state.nm.us'  
**Cc:** 'Pat Corser,; 'Clay\_Clarke@nmenv.state.nm.us'  
**Subject:** ak



CH WAP Att-b41.doc

Steve:  
Attached is a rough edit of the ak requirements out of Wipp permit.  
I didn't address a paper audit process but will consider your proposal.

Pete

<<CH WAP Att-b41.doc>>

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**ATTACHMENT**

**WASTE CHARACTERIZATION USING  
ACCEPTABLE KNOWLEDGE**

Waste Isolation Pilot Plant  
Hazardous Waste Permit  
February 25, 2002

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**ATTACHMENT**

**WASTE CHARACTERIZATION USING  
ACCEPTABLE KNOWLEDGE**

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## ATTACHMENT WASTE CHARACTERIZATION USING ACCEPTABLE KNOWLEDGE

### B4-1 Introduction

The Resource Conservation and Recovery Act (**RCRA**) regulations codified in 40 CFR Parts 260 through 265, 268, and 270, and the New Mexico Hazardous Waste Management Regulations in Title 20 New Mexico Administrative Code, Chapter 4, Part 1, (20.4.1 NMAC) 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. Acceptable knowledge is described in *Waste Analysis: EPA Guidance Manual for Facilities That Generate, Treat, Store and Dispose of Hazardous Waste* (EPA, 1994). Acceptable knowledge, 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).

### B4-2 Acceptable Knowledge Documentation

The Permittees shall obtain from each waste generator/storage site (**site**) a logical sequence of acceptable knowledge information that progresses from general facility information to more detailed waste-specific information.

The following sections include the information the Permittees will require for each site to characterize waste using acceptable knowledge. Because waste generating processes are site-specific, sites shall, as necessary, supplement the required acceptable knowledge records with additional information (see Section B4-2c, Supplemental Acceptable Knowledge Information). If the required information is not available for a particular waste, supplemental information shall be obtained.

#### B4-2a Required Waste Management Program Information

Waste management program information shall clearly define waste categorization schemes and terminology, provide a breakdown of the types and quantities of waste that are generated and stored at the site, and describe how waste is tracked and managed at the site, including historical and current operations. Information related to waste certification procedures and the types of documentation (e.g., waste profile forms) used to summarize acceptable knowledge shall also be provided. The following information shall be included as part of the acceptable knowledge written record:

- Map of the site with the areas and facilities involved in waste generation, treatment, and storage identified
- Facility mission description as related to waste generation.
- Description of the operations that generate
- Waste identification or categorization schemes used at the facility (e.g., item description codes, content codes)

- Types and quantities of waste generated, including historical generation through future projections
- Correlation of waste streams generated from the same building and process, as appropriate (e.g., sludge, combustibles, metals, and glass)
- Waste certification procedures for wastes to be sent to the WIPP facility

#### B4-2b Required Waste Stream Information

The Permittees may use acceptable knowledge to delineate site-specific waste streams. For each waste stream, the Permittees shall require sites to compile all process information and data that support the acceptable knowledge used to characterize that waste stream. The type and quantity of supporting documentation will vary by waste stream, depending on the process generating the waste and site-specific requirements imposed by the Permittees. At a minimum, the waste process information shall include the following written information:

- Area(s) and/or building(s) from which the waste stream was or is generated
- Waste stream volume and time period of generation
- Waste generating process described for each building (e.g., batch waste stream generated during decommissioning operations of glove boxes)
- Process flow diagrams (e.g., a diagram illustrating glove boxes from a specific building to a size reduction facility to a container storage area). In the case of research/development, analytical laboratory waste, or other similar processes where process flow diagrams cannot be created, a description of the waste generating processes, rather than a formal process flow diagram, may be included if this modification is justified and the justification is placed in the auditable record
- Material inputs or other information that identifies the chemical content of the waste stream and the physical waste form (e.g., glove box materials and chemicals handled during glove box operations, if applicable)

The acceptable knowledge written record shall include a summary that identifies all sources of waste characterization information used to delineate the waste stream. The basis and rationale for delineating each waste stream, based on the parameters of interest, shall be clearly summarized and traceable to referenced documents. Assumptions made in delineating each waste stream also shall be identified and justified. If discrepancies exist between required information, then sites shall apply all hazardous waste codes indicated by the information to the subject waste stream unless the sites choose to justify an alternative assignment and document the justification in the auditable record. The Permittees shall obtain from each site, at a minimum, procedures that comply with the following acceptable knowledge requirements:

- Procedures for identifying and assigning the physical waste form of the waste
- Procedures for delineating waste streams and assigning Waste Matrix Codes

- Procedures for resolving inconsistencies in acceptable knowledge documentation
- Procedures to document how changes to Waste Matrix Codes, waste stream assignment, and associated EPA hazardous waste numbers based on material composition are documented for any waste
- Procedures for newly generated waste shall describe how acceptable knowledge is confirmed.

#### B4-2c Supplemental Acceptable Knowledge Information

The generator sites shall obtain supplemental acceptable knowledge information. The amount and type of supplemental information is site-specific and cannot be mandated, but sites shall collect information as appropriate to support required information. Sites will use this information to compile the acceptable knowledge written record. Supplemental acceptable knowledge documentation that may be used (if available) in addition to the required information specified above include, but are not limited to, the following information:

- Process design documents (e.g., Title II Design)
- Standard operating procedures that may include a list of raw materials or reagents, a description of the process or experiment generating the waste, and a description of wastes generated and how the wastes are managed at the point of generation
- 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
- Site databases (e.g., chemical inventory database for Superfund Amendments and Reauthorization Act Title III requirements)
- Information from site personnel (e.g., documented interviews)
- Standard industry documents (e.g., vendor information)
- Analytical data relevant to the waste stream, including results from fingerprint analyses, spot checks, or routine verification sampling. This may also include new information acquired apart from the confirmatory process which supplements required information (e.g., visual examination not performed in compliance with the WAP)
- Material Safety Data Sheets, product labels, or other product package information
- Sampling and analysis data from comparable or surrogate waste streams (e.g., equivalent nonradioactive materials)

- Laboratory notebooks that detail the research processes and raw materials used in an experiment

All specific, relevant supplemental acceptable knowledge documentation assembled and used in the acceptable knowledge process, whether it supports or contradicts any required acceptable knowledge documentation, shall be identified and an explanation provided for its use (e.g., identification of a toxicity characteristic). Supplemental documentation may be used to further document the rationale for the hazardous characterization results. Similar to required information, if discrepancies exist between supplemental information and the required information, then sites shall apply all hazardous waste codes indicated by the supplemental information to the subject waste stream unless the sites choose to justify an alternative assignment and document the justification in the auditable record.

#### B4-3 Acceptable Knowledge Training, Procedures and Other Requirements

The Permittees shall require consistency among sites in using acceptable knowledge information to characterize waste by the use of the following three phase process: 1) compiling the required and supplemental acceptable knowledge documentation in an auditable record, 2) auditing acceptable knowledge records. This section specifies qualification and training requirements, describes each phase of the process, specifies the procedures that the Permittees shall require all sites to develop to implement the requirements for using acceptable knowledge, and specifies data quality requirements for acceptable knowledge.

#### B4-3a Qualifications and Training Requirements

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

- State and Federal RCRA regulations associated with solid and hazardous waste characterization
- Discrepancy resolution and reporting processes
- Site-specific procedures associated with waste characterization using acceptable knowledge

#### B4-3b Acceptable Knowledge Assembly, Compilation, and Confirmation Procedures and Required Administrative Controls

The Permittees shall obtain from sites acceptable knowledge procedures which require consistent application of the acceptable knowledge process and requirements. Site-specific acceptable knowledge procedures shall address the following:

- Sites shall prepare and implement a written procedure outlining the specific methodology used to assemble acceptable knowledge records, including the origin of the documentation, how it will be used, and any limitations associated

with the information (e.g., identify the purpose and scope of a study that included limited sampling and analysis data).

- Sites shall develop and implement a written procedure to compile the required acceptable knowledge record.
- Sites shall develop and implement a written procedure that ensures unacceptable wastes (e.g., reactive, ignitable, corrosive) are identified and segregated from waste populations sent to the facility.
- Sites shall prepare and implement a written procedure to evaluate acceptable knowledge and resolve discrepancies. If different sources of information indicate different hazardous wastes are present, then sites shall include all sources of information in its records and conservatively assign all potential hazardous waste codes unless the sites choose to justify an alternative assignment and document the justification in the auditable record. The assignment of hazardous waste codes shall be tracked in the auditable record to all required documentation.
- Sites shall prepare and implement a written procedure to identify hazardous wastes and assign the appropriate hazardous waste codes to each waste stream. The following are minimum baseline requirements/standards that site-specific procedures shall include to ensure comparable and consistent characterization of hazardous waste:
  - Compile all of the required information in an auditable record.
  - 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 listed hazardous waste codes unless the sites choose to justify an alternative assignment and document the justification in the auditable record.
  - 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 contaminant is identified and is not included as a listed waste, assign the toxicity characteristic code unless data are available that demonstrate that the concentration of the constituent in the waste is less than the toxicity characteristic regulatory level. When data are not available, the toxicity characteristic hazardous waste code for the identified hazardous constituent shall be applied to the mixed waste stream.

For newly generated wastes, procedures shall be developed and implemented to characterize hazardous waste using acceptable knowledge prior to packaging the waste.

- Sites shall prepare and implement a written procedure that provides a cross reference to the applicable waste summary category group (i.e., S3000, S4000, and S5000) to verify all of the required confirmation data has been evaluated and the proper hazardous waste codes have been assigned.

#### B4-3c Criteria for Assembling an Acceptable Knowledge Record and Delineating the Waste Stream

Figure B4-1 provides an overview of the process for assembling acceptable knowledge documentation into an auditable record. The first step is to assemble all of the required acceptable knowledge information and any supplemental information regarding the materials and processes that generate a specific waste stream. The Permittees shall require the sites to implement procedures which comply with the following criteria to establish acceptable knowledge records:

- Acceptable knowledge information shall be compiled in an auditable record, including a road map for all applicable information.
- The overview of the facility and waste management operations in the context of the facility's mission shall be correlated to specific waste stream information.
- Correlations between waste streams, with regard to time of generation, waste generating processes, and site-specific facilities shall be clearly described. For newly generated wastes, the rate and quantity of waste to be generated shall be defined.
- A reference list shall be provided that identifies documents, databases, Quality Assurance protocols, and other sources of information that support the acceptable knowledge information.

#### B4-3d Requirements for Confirmation of Acceptable Knowledge Information

Acceptable knowledge characterization results shall be confirmed for

For wastes, sites shall have written procedures to document the confirmation of acceptable knowledge information with visual examination prior to or during waste packaging. The following minimum requirements shall be addressed in site-specific procedures:

- scope (i.e., waste streams) and purpose;
- responsible organization(s);
- administrative process controls;
- material inputs to process;
- process controls and range of operation that affect final hazardous waste characterization;
- rate and quantity of the hazardous waste generated;
- list of applicable operating procedures relevant to the hazardous waste characterization;

- process knowledge verification sampling (i.e., headspace-gas sampling and/or homogeneous waste annual sampling); and
- reporting and records management.

Potential toxicity characteristics for base materials that compose heterogeneous debris (S5000) waste may be determined without destructive sampling and analysis via acceptable knowledge. Sites will assign a Waste Matrix Code and waste stream to each container of waste using acceptable knowledge. In lieu of confirmatory sampling and analytical or other data to the contrary, sites shall assign the toxicity characteristic hazardous waste codes based on the presence of the constituent identified by acceptable knowledge, regardless of the quantity or concentration.

Hazardous wastes associated with S3000 and S4000 waste streams will be verified based on the results of the total/TCLP analysis of a representative homogeneous waste sample.

#### B4-3e Acceptable Knowledge Data Quality Requirements

Analytical results will be used to confirm the characterization of wastes based on acceptable knowledge. To ensure that the acceptable knowledge process is consistently applied, the Permittees shall require sites to comply with the following data quality requirements for acceptable knowledge documentation:

- Precision - Precision is the agreement among a set of replicate measurements without assumption of the knowledge of a true value. The qualitative determinations, such as compiling and assessing acceptable knowledge documentation, do not lend themselves to statistical evaluations of precision. Therefore, precision requirements are not established for acceptable knowledge.
- Accuracy - Accuracy is the degree of agreement between an observed sample result and the true value. The percentage of waste containers which require reassignment to a new Waste Matrix Code and/or designation of different hazardous waste codes based on the reevaluation of acceptable knowledge or on obtaining sampling and analysis data will be reported as a measure of acceptable knowledge accuracy.
- Completeness - Completeness is an assessment of the number of waste streams or number of samples collected to the number of samples determined to be useable through the data validation process. The acceptable knowledge record shall contain 100 percent of the information specified in Section B4-2. The useability of the acceptable knowledge 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 sites meeting the training requirements and complying with the minimum standards outlined for procedures that are used to implement the acceptable knowledge process. All sites shall assign hazardous waste codes in accordance with Section B4.3b and provide this information regarding its waste to other sites who store or generate a similar waste stream.

- 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 acceptable knowledge information is performed in accordance with the minimum standards established in Section B4-3b. Sites also shall assess and document the limitations of the acceptable knowledge 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).

**FIGURES**

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