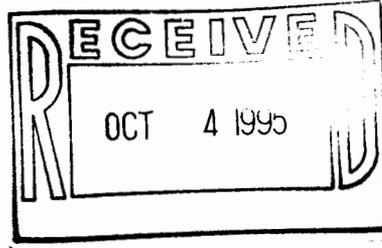


October 3, 1995



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Mr. Steve Zappe
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**Final Predictional Draft *Transuranic Waste*
*Characterization Acceptable Knowledge Guidance Document***

Dear Mr. Zappe:

As you requested from the DOE Carlsbad Area Office, please find enclosed two bound copies of the above referenced document. If you have any questions or comments regarding the information contained in the above referenced document, please contact Russ Bisping.

Sincerely,

A handwritten signature in cursive script, appearing to read "Karen Knudtsen".

Karen Knudtsen
Project Manager

KK/TSK
Enclosures

cc without enclosures:

Russ Bisping, DOE Carlsbad Area Office, Carlsbad
Central Files, Albuquerque

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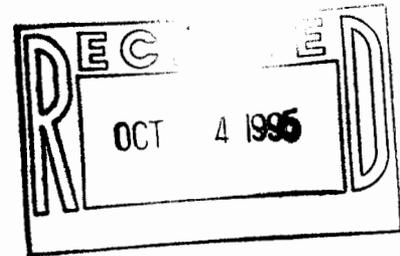
**Predecisional Draft
Transuranic Waste Characterization
Acceptable Knowledge Guidance Document**



AUGUST 1995

**PREDECISIONAL DRAFT
TRANSURANIC
WASTE CHARACTERIZATION
ACCEPTABLE KNOWLEDGE
GUIDANCE DOCUMENT**

August 1995



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TRANSURANIC WASTE CHARACTERIZATION ACCEPTABLE KNOWLEDGE GUIDANCE DOCUMENT

1.0 INTRODUCTION

The Department of Energy (DOE) Carlsbad Area Office (CAO) National Transuranic (TRU) Program (NTP) is responsible for disseminating TRU waste characterization guidance and facilitating the timely and cost-effective development of TRU waste characterization programs at DOE generator and storage sites. Using the data quality objective (DQO) process, DOE has determined that acceptable knowledge, used in conjunction with other waste characterization techniques, is appropriate to obtain the required TRU waste characterization information (DOE 1995a).

Each DOE generator/storage site must develop a site-specific sampling plan that outlines the TRU waste stream sampling strategy to meet the Waste Isolation Pilot Plant (WIPP) waste characterization requirements (DOE 1995a). Sampling plans will provide the justification for grouping retrievably stored and newly generated wastes into waste streams based on physical, chemical, and radiological parameters of interest. DOE generator/storage sites are responsible for defining TRU waste streams at their sites. Each site must describe and justify how each waste stream is defined in its site-specific sampling plan. To this end, the sampling plans must include a description of the acceptable knowledge used in waste characterization activities. The NTP has developed the present document to provide guidance for compiling acceptable knowledge information regarding retrievably stored and newly generated TRU waste to support TRU and TRU mixed waste characterization and certification requirements.

The objective of this guidance document is to support the DOE generator/storage sites in establishing consistent, defensible, and auditable records of acceptable knowledge for TRU waste that will be sent to the WIPP facility. Acceptable knowledge refers to information that can be used for waste characterization in lieu of waste sampling and analysis conducted in accordance with the requirements specified in the *Transuranic Waste Characterization Quality Assurance Program Plan (QAPP)* (DOE 1995a), and may include process knowledge and the results of previous or surrogate waste sampling and analysis. Through the use of this guidance, DOE TRU waste generator/storage sites will develop an acceptable knowledge record for each TRU waste stream that will be audited by the CAO for compliance with the TRU waste characterization program requirements. Each site shall use this guidance to produce a document (or integrated series of documents) that will meet the following objectives:

- Provide the general site background and program management information relevant to TRU waste;
- Compile the details of acceptable knowledge available for individual waste streams in an auditable record; and
- Provide a referenceable document supporting technical publications and submissions to regulatory agencies.

2.0 DEFINITIONS

Acceptable knowledge is the term used by the Environmental Protection Agency (EPA) in its guidance document, *Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Wastes* (EPA 1994a). Acceptable knowledge includes process knowledge and results from previous testing, sampling, and analysis associated with the waste. Acceptable knowledge includes information regarding the raw materials used in a process or operation, process description, products produced, and associated wastes. Acceptable knowledge documentation may include the site history and mission, site-specific processes or operations, administrative building controls, and all previous and current activities that generate a specific waste.

Batch waste streams are waste streams generated from a particular unit chemical process, unit physical mixing process, or other short-term operation. Batch processes result in a waste stream that is substantially uniform.

Data Quality Objectives (DQOs) is a term defined by the EPA in its document, *Guidance for the Data Quality Objectives Process* (EPA 1994b). DQOs are qualitative and quantitative statements derived from the output of the DQO process that (1) clarify the study objective, (2) define the most appropriate type of data to collect, (3) determine the most appropriate conditions under which to collect the data, and (4) specify tolerable limits on decision errors that will be used as the basis for establishing the quantity and quality of data needed to support the decision. The DQOs are then used to develop a scientific and resource-effective data collection design.

Newly generated TRU waste is waste generated after the development, approval, and implementation of a TRU waste characterization program that meets the requirements outlined in the QAPP (DOE 1995a).

at WIPP
or generator
sites

Process knowledge is a term used by the EPA to refer to detailed information on a waste that is obtained from existing published or documented waste analysis data or studies conducted on hazardous wastes generated by process similar to that which generated the waste (EPA 1994a). Process knowledge describes the process or operation that generated the waste that is being characterized. Process knowledge is used to identify specific constituents in a waste stream and the method (or process) by which the constituents are used which created the final waste.

Process waste streams are waste streams generated from a system or series of continuous or regularly occurring actions taking place in a predetermined manner over extended periods of time. Continuous processes perform a defined operation on specific inputs over a period of time, even though the process may be run for intermittent time periods. A process results in a waste stream that is substantially uniform.

Retrievably stored TRU waste is waste generated from 1970 until the development, approval, and implementation of a TRU waste characterization program that meets the requirements outlined in the QAPP (DOE 1995a).

Road map is a detailed directory of information that provides the location of all acceptable knowledge documentation, a summary of the information found in the acceptable knowledge references, and the logic used in collecting and analyzing the information. The road map serves as a guide to locate acceptable knowledge documentation.

Waste certification is a process established under DOE Order 5820.2A, "Radioactive Waste Management," for the management of radioactive waste. Waste certification extends to all aspects of the waste management process, from waste generation and characterization to waste packaging, storage, transport, and disposal. TRU waste certification program requirements and waste acceptance criteria are documented in the *Waste Acceptance Criteria for the Waste Isolation Pilot Plant (WIPP WAC)* (DOE 1991).

Waste characterization is a set of activities that determine the physical, chemical, and radiological properties of the waste. Waste characterization may include acceptable knowledge; nonintrusive examinations, such as radiography and nondestructive assay; or intrusive examination, such as sampling

and analysis or visual examination. The TRU waste characterization requirements are specified in the QAPP (DOE 1995a).

Waste stream is a volume of waste generated from a single process or activity that is similar in material, physical form, isotopic makeup, and hazardous constituents. Waste streams are defined by volumes of waste with specific, definable characteristics that remain the same or vary within a known range throughout the life of the process generating the waste. A waste stream is produced by a single process or subprocess; however, that process or subprocess may combine with two or more waste inputs to produce a single output waste stream (e.g., waste water inputs to a treatment facility that produces a final sludge waste stream). Waste characterization and DQO activities are performed on a waste stream basis.

3.0 BACKGROUND INFORMATION

The WIPP facility is a geologic repository to be used for the disposal of containerized, nonliquid TRU and TRU mixed waste. Acceptable knowledge documentation is required for the WIPP facility to comply with a wide range of waste management regulations and DOE orders. The WIPP compliance programs and associated WIPP documents, which include acceptable knowledge as part of TRU waste characterization, are described briefly in the following section. In addition, the approach to defining TRU waste streams for the purpose of waste characterization is described in relation to other related DOE waste categorization schemes.

Documenting acceptable knowledge is the first step in implementing the TRU waste characterization program. TRU waste parameters that are characterized using acceptable knowledge are summarized according to applicable regulatory and programmatic requirements (Table 3-1); acceptable knowledge is then supported by other waste characterization techniques (DOE 1995a). Acceptable knowledge documentation forms the basis for implementing the required testing, sampling, and analytical requirements specified in the QAPP (DOE 1995a). For example, acceptable knowledge is used to define a waste stream and determine the waste matrix category (DOE 1995c); the category is then confirmed using radiography.

Table 3-1. Summary of TRU Waste Parameters that are Characterized Using Acceptable Knowledge^{1 2}

TRU Waste Parameter	WIPP Operational and Safety Criteria	Transportation: TRUPACT-II	RCRA Requirements	Performance Assessment
Waste Categories				
Waste Matrix Category			•	•
TRUCON Code		•		
Physical Waste Form				
Waste Material Parameters				•
Particulates	•			
Free Liquids	•			
Explosives	•	•	•	
Compressed Gases	•	•	•	
Chemical Properties				
Pyrophoric Materials	•			
Ignitability		•	•	
Corrosivity		•	•	
Reactivity		•	•	
Toxicity Characteristics ³			•	
Listed Waste			•	
Hazardous Constituents ³			•	
Radiological Parameters				
Individual Radionuclide Concentrations	•	•		•

¹Acceptable knowledge is used in conjunction with other waste characterization techniques.

²Final waste characterization requirements for remote-handled TRU waste have not been established. Similar waste characterization parameters are expected, although waste characterization techniques may vary.

³Summary Categories S5000 and X7000 are characterized for these parameters using acceptable knowledge exclusively (DOE 1995a).

3.1 Applicable Regulations

Under the Resource Conservation and Recovery Act (RCRA), The WIPP geologic repository is regulated as a miscellaneous unit. DOE must demonstrate compliance with EPA regulations under 40 CFR Part 264, Subpart X, which contain general permitting requirements for miscellaneous hazardous waste management units. The WIPP facility is not designed to routinely open TRU waste containers. All waste analysis will be conducted by the DOE generator/storage sites prior to shipment to the WIPP facility. As required under 40 CFR §264.13 for permitted facilities, DOE has developed a waste analysis plan that establishes the waste characterization requirements for TRU mixed waste, including the use of acceptable knowledge (DOE 1995b). DOE generator/storage sites must certify compliance with the waste analysis plan requirements before they ship waste to the WIPP facility.

The DOE is also seeking a variance from the RCRA land disposal restrictions to accept untreated TRU mixed waste at the WIPP facility. Therefore, DOE must comply with the regulations under 40 CFR §268.6 that address the requirements for demonstrating no-migration of hazardous constituents. DOE included acceptable knowledge documentation in the WIPP *No-Migration Variance Petition* (DOE 1990). Based on the information provided in the petition, the EPA Office of Solid Waste granted a conditional no-migration determination for the WIPP test phase. Similar types of process knowledge information are necessary to demonstrate compliance for the WIPP operational phase.

As a geologic repository for the permanent disposal of TRU waste, the WIPP facility is also subject to the EPA regulations specified under 40 CFR Part 191. These regulations establish standards for radioactive material releases and radiation doses associated with TRU waste storage and disposal. The certification criteria for compliance with the requirements specified in 40 CFR Part 191 will be promulgated under 40 CFR Part 194. The proposed rule (60 FR 5766, January 30, 1995) requires that any application for certification of compliance must provide information that substantiates any determination of waste characteristics based on knowledge of the processes and materials that generated the waste. Using acceptable knowledge, DOE has compiled chemical, physical, and radionuclide information for TRU waste that may be important for compliance with the WIPP performance assessment in the *Waste Isolation Pilot Plant Transuranic Waste Baseline Inventory Report* (WTWBIR) (DOE 1995d). Based on the final WIPP performance assessment results, DOE will determine which waste parameters are important with regard to the long-term repository performance.

In accordance with 10 CFR Part 71, the Nuclear Regulatory Commission issued DOE a Certificate of Compliance for the shipment of TRU waste in the Transuranic Package Transporter-II (TRUPACT-II). The *Safety Analysis Report for the TRUPACT-II Shipping Package* describes the payload and packaging requirements for TRU waste transported in the TRUPACT-II (Nuclear Packaging, Inc. 1992). Acceptable knowledge information is a primary component of compliance with the TRUPACT-II certification requirements.

The DOE has established the WIPP WAC (DOE 1991) that summarizes all of these requirements, as well as the WIPP operational and safety criteria. Based on programmatic and regulatory requirements, the DOE updates the WIPP WAC to address new and revised criteria. Prior to shipment of waste to the WIPP facility, DOE generator/storage sites must certify that their waste complies with the final WIPP WAC. Certification authority is granted to DOE generator/storage sites by CAO for specific waste streams based on the completion of a successful audit of site certification programs. As part of the certification process, acceptable knowledge must be certified as true and correct by an individual familiar with the process that generated the wastes.

3.2 Quality Assurance Requirements

A detailed description of the quality assurance (QA) and quality control (QC) requirements for the TRU waste characterization program is provided in the QAPP (DOE 1995a). The DQOs established for the TRU waste characterization program support compliance with specific regulations discussed above and address the characterization parameters that must be evaluated. For each parameter of interest, the QAPP provides requirements for waste characterization, which include the use of acceptable knowledge, nondestructive testing, sampling, and analysis. These requirements have been established to meet specific DQOs. TRU waste generator/storage sites must develop quality assurance project plans that describe site-specific TRU waste characterization programs.

The QA/QC requirements associated with certification of compliance with WIPP operational and safety criteria and TRUPACT-II shipping requirements are provided in the WIPP WAC (DOE 1991). TRU waste generator/storage sites must prepare certification plans and associated QA plans that describe site-specific TRU waste certification programs. CAO reviews and approves all applicable program documents and conducts annual audits and surveillances of each generator/storage site. CAO will provide written notice to each site of the specific wastes that may be certified for shipment to the WIPP facility. CAO

annually reviews waste characterization and certification programs and provides notice of continued waste certification to the sites.

Auditable records are those records that are maintained in such a manner that a person not involved in the operation can review the available waste characterization information, comprehend it, identify the waste stream associated with each waste characterization file, and understand the basis for the waste classification. An acceptable knowledge record must include a reference file that identifies the acceptable knowledge documents and their locations.

3.3 Waste Categorization

Depending on the waste management objectives (e.g., treatment technology development, safe storage, waste characterization) wastes may be categorized differently. For example, wastes are often grouped together based on chemical compatibility for purposes of safe storage. For purposes of transportation, CH TRU wastes are grouped according to TRUPACT-II content codes (TRUCON codes) that reflect the radionuclide and packaging requirements for shipment in the TRUPACT-II.

In 1992, Congress established the Federal Facilities Compliance Act (FFCA) that required, among other things, the DOE to develop a comprehensive mixed waste inventory and associated site treatment plans to comply with the RCRA land disposal restrictions. The CAO has used the waste categories established in FFCA documents to summarize all WIPP-specific waste characterization information. Depending on the objectives of various DOE programs, waste information is compiled to various levels of detail. This section provides an overview of the objectives of different waste groupings and a description of how waste streams are defined within those groups to support the CAO TRU waste characterization program.

3.3.1 DOE Waste Treatability Group Guidance

To comply with the FFCA, DOE developed the *DOE Waste Treatability Group Guidance* (DOE 1995c). Based on this guidance, DOE established the Mixed Waste Inventory Report (MWIR) (DOE 1994a) to identify and categorize all DOE mixed wastes. The categorization scheme provided in the guidance was established by DOE to identify the various RCRA treatment technologies and associated capacities needed to manage a site's waste in compliance with the RCRA land disposal restrictions. The categorization is based on physical waste form and mixed waste characteristics and constituents that must be treated to meet the RCRA treatment standards prior to land disposal. The guidance contains over 300 treatability groups that comprise all mixed waste managed by the DOE.

3.3.2 WIPP TRU Waste Baseline Inventory Report

To address WIPP-specific waste information required to support the WIPP performance assessment, the CAO established the WTWBIR (DOE 1995d). The WTWBIR consolidated waste information provided in the *Mixed Waste Inventory Report* (DOE 1994a), which provided RCRA-regulated chemical information, and the *Integrated Data Base* (DOE 1994b), which provided radionuclide information. The WTWBIR also includes nonmixed TRU wastes, waste material parameter information, and the disposal inventory, which is the total TRU inventory that will be used in WIPP performance assessment calculations.

In the WTWBIR (DOE 1995d), the DOE has utilized the categories established in the *DOE Waste Treatability Group Guidance*, but grouped waste into 11 WIPP-specific waste profiles according to physical waste material parameters that are of potential importance to the WIPP performance assessment. Waste categories for the WTWBIR are based on the dominance of one or more of the waste material parameters. The WIPP waste profiles provide an estimated range of waste material parameters (e.g., cellulose, iron-based metals/alloys, rubber) and isotopic composition, which are inputs for the WIPP performance assessment models. For example, all inorganic non-metal wastes from all DOE sites are grouped together into a WIPP waste profile to obtain an estimated total WIPP disposal waste volume.

3.3.3 TRU Waste Characterization Program

For purposes of TRU waste characterization, the CAO has adopted the waste description nomenclature outlined in the *DOE Waste Treatability Group Guidance* (DOE 1995c). Four broad matrix parameter categories of waste are used to describe the physical form of the waste and to determine TRU waste characterization requirements: homogeneous solids (summary category S3000), soil/gravel (summary category S4000), debris wastes (summary category S5000), and special waste (summary category X7000). Summary categories contain a number of waste streams.

Waste streams are defined based on volumes of waste identified with the same expected physical, chemical, and radiological properties (Table 3-1). Distinguishing TRU waste streams for the purpose of characterization includes considering the following factors:

- The summary category of the waste
- Whether the waste is newly generated or retrievably stored
- Whether the waste is generated from a continuous process or in a batch

As a first step in defining a TRU waste stream, DOE sites will use acceptable knowledge to assess the waste with respect to these factors.

Waste characterization requirements are determined based on summary categories. For example, homogeneous solids (S3000) and soil/gravel (S4000) must be sampled and analyzed to determine if the waste stream exhibits a toxicity characteristic (40 CFR Part 261, Subpart C). Sampling and analysis is not required to determine if debris waste streams (S5000) and special waste streams (X7000) exhibit a toxicity characteristic, rather acceptable knowledge alone is used (Table 3-1) (DOE 1995a).

To establish the necessary type and quantity of acceptable knowledge information, newly generated waste is distinguished from retrievably stored waste. Differences are based on the presumptions that, for newly generated waste, options are available to plan waste characterization strategies prior to generating the waste and good management practices can be implemented, such as waste segregation. For example, decontamination and decommissioning activities may result in newly generated TRU waste; therefore, waste characterization should be an integral part of the decontamination and decommissioning process. As appropriate, sites may use currently implemented waste certification requirements to obtain the necessary waste characterization information, including acceptable knowledge documentation.

Process and batch waste streams are identified to ensure that representative waste characterization data are obtained. Acceptable knowledge information must be used to describe continuous processes and to document changes in the process over time. Acceptable knowledge must also be used to describe one-time batch waste generating processes. The number of samples that is necessary to obtain a representative sample of a retrievably stored, homogeneous solid or soil/gravel waste stream will vary based on this information. For example, utilizing acceptable knowledge in defining retrievably stored, homogeneous solid and soil/gravel waste streams should enable sites to minimize the variability of hazardous constituent concentrations among waste containers. The less variability in the parameters of interest, the fewer number of samples that will be required to meet the DQO. In addition, newly generated, homogeneous solid and soil/gravel waste streams generated from a continuous process must be sampled once per year, while batch waste streams must be sampled once per batch.

Finally, specific waste streams are identified based on the waste characterization objectives (i.e., similar physical, chemical, and radiological properties) (Table 3-1). Depending on the matrix parameter category and the parameter of interest, additional acceptable knowledge, testing, sampling, and analytical

information may be required to complete the waste characterization documentation (DOE, 1995a). For example, one hundred containers of inorganic sludge may contain comparable quantities of radionuclides. Based on inputs to a process, a batch of these containers of this waste may exhibit a toxicity characteristic for cadmium, while the others contain no RCRA-regulated constituents. In this example, the site should identify two waste streams for purposes of sampling and analysis. The ability to separate this waste into two waste streams would potentially result in a reduction in the number of samples that must be collected and analyzed to characterize each waste stream, thus reducing the cost of characterization.

4.0 ACCEPTABLE KNOWLEDGE DOCUMENTATION

Waste generating processes are site-specific; therefore, the types of information used to document acceptable knowledge at each site will vary. However, consistent presentation of the information among DOE sites in auditable records will support the verification of acceptable knowledge. In addition, the well-defined use and application of acceptable knowledge information, which is used to achieve the established DQOs, will help assure that the acceptable knowledge is adequate and complete.

Acceptable knowledge for TRU wastes includes historical and current process information and data. In cases where TRU waste generating processes have not changed over time with respect to the parameters of interest, information regarding current waste generating processes may provide a basis to document acceptable knowledge for retrievably stored waste. In addition, some processes have been developed at one DOE facility and implemented on a production level at another. To improve cost-effectiveness and efficiency, sites should exchange applicable acceptable knowledge information with other sites that generate or store similar wastes.

The overall goal for documenting acceptable knowledge is to develop a logical sequence of information compiled in one document that progresses from general facility information to more detailed, waste-specific information. The guidelines for documenting acceptable knowledge are:

- Acceptable knowledge information must be compiled in an auditable record, including a road map for all applicable information.
- The overview of the facility and TRU waste management operations in the context of the facility's mission must be correlated to specific waste stream information.

- Correlations between waste streams, with regard to time of generation, waste generating processes, and DOE facilities must be clearly described.
- A reference list must be provided that identifies documents, databases, and QA protocols that support the acceptable knowledge.

4.1 Classes of Acceptable Knowledge Information

Acceptable knowledge may include a wide variety of information. Acceptable knowledge documentation has been summarized in eight classes of information that sites should consider when developing auditable records. Examples of supporting information, potentially applicable documents, and databases for each class of information is provided in this section.

Waste Generating Process Information. Process knowledge information forms the basis of acceptable knowledge documentation. This class of information includes process flow diagrams, documented inputs and outputs, process controls based on product specifications, and operating procedures.

Engineering and Design Information. Building and process engineering and design information may describe controls relevant to specific parameters of interest. For example, design of certain systems may limit the chemical or physical parameters of inputs to, and outputs from, a system. This class of information includes, but is not limited to, piping diagrams, glove box designs, equipment specifications, and holding tank specifications.

Supporting Data. Supporting data refers to testing, sampling, or analytical data collected for the waste without a QA program that meets the QAPP requirements (DOE 1995a) or data collected on a similar waste, with or without a qualifying QA program. Examples of this class of information are surrogate waste sampling and analysis data; comparable waste stream data, such as nonradioactive equivalent waste streams; site remedial investigation data; and sampling and analytical data obtained prior to final waste treatment.

Supplemental Data. Supplemental data are not actual waste characterization data but rather data that are obtained from ancillary environmental compliance programs. This class of information includes data from environmental monitoring programs, research and development work, process control data, such as effluent monitoring, and product quality control data.

Expert Knowledge. Expert qualifications are based on the individual's duration and relevance of work experience, education or training, knowledge relevant to the waste generating process, or knowledge relevant to waste management. This class of information includes personnel interviews, archival research, site inspections, and test plans or research project reports that describe the reagents and other raw materials used in experiments.

Standard Industry Practice Information. This class of information reflects commonly accepted knowledge based on industry practice or accepted scientific principles. Examples include vendor information; material safety data sheets; common industrial operations, such as electroplating; and accepted treatment processes, such as inorganic waste water treatment operations.

Compliance Program Information. This class of information includes data obtained for compliance with other regulations or precedents established by other regulatory requirements. Examples include transportation documentation, RCRA permit requirements, safety analysis reports, occupational health and safety criteria, chemical inventory databases, process waste assessments conducted to comply with waste minimization requirements, and hazardous air pollutant inventories developed to comply with the Clean Air Act amendments.

Program Management Information. Program management information documents how a site conducts waste management programs and may be useful in demonstrating process controls. This class of information includes training records, QA plans, procurement documents, operating procedures, waste packaging logs, documented administrative controls, and waste certification procedures and records.

The types and quantities of information used in the acceptable knowledge documentation will vary depending on the waste generating process, the waste stream, and the waste parameter of interest. At a minimum, each site must provide the TRU waste management program information and TRU waste stream information described below as part of its acceptable knowledge documentation. Acceptable knowledge records may include other information from any of the classes.

4.2 TRU Waste Management Program Information

An overview of the TRU waste program provides an understanding of TRU waste management operations at each site. This overview, which will establish the basis for more detailed TRU waste stream

information, must reveal an overall perspective of TRU waste management operations and serve as a guide to the waste stream-specific information.

TRU waste management program information must clearly define waste categorization schemes and terminology, provide a breakdown of the types and quantities of TRU 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 TRU waste certification procedures and the types of documentation (e.g., waste profile forms) used to summarize acceptable knowledge must also be provided. The following information must be included as part of the acceptable knowledge record:

- Map of the facility with the areas and facilities involved in TRU waste generation, treatment, and storage identified
- Facility mission description as related to TRU waste generation and management (e.g., nuclear weapons research may involve metallurgy, radiochemistry, and nuclear physics operations that result in specific waste streams)
- Description of the operations that generate TRU waste at the site (e.g., plutonium recovery, weapons design, weapons fabrication)
- Waste identification or categorization schemes used at the facility (e.g., item description codes, content codes)
- Types and quantities of TRU waste generated, including historical generation through future projections
- Correlation of waste streams generated from the same building and process (e.g., sludge, combustibles, metals, glass)
- Waste certification procedures

4.3 TRU Waste Stream Information

For each TRU waste stream, sites must 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 DOE or state agencies. At a minimum, the waste process information must include the factors discussed in Section 3.3.3 and:

- Area(s) and building(s) from which the waste stream was or is generated
- Waste stream volume and time period of generation (e.g., 100 standard waste boxes of retrievable stored waste generated from June 1977 through December 1977)

- 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)
- Material inputs or other information that identifies the chemical and radionuclide content of the waste stream and the physical waste form (e.g., glove box materials, chemicals and radionuclides handled during glove box operations)

All sources of information must be identified in an auditable record. The basis and rationale for defining each waste stream based on the parameters of interest must be clearly summarized and traceable to referenced documents. Assumptions made in defining each waste stream also must be identified and justified.

Sites should conduct internal independent assessments of final documentation to ensure a logical and complete record of information. Assessments should consider whether information is presented consistently between waste streams and whether a clear and defensible justification of acceptable knowledge information is provided in the record. In addition, sites should disseminate information regarding the site-specific applications of acceptable knowledge and waste stream information and data that may be applicable to other DOE sites.

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