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June 24, 1998

Ed Kelley, Ph.D.
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New Mexico Environment Department
1190 St. Francis Drive
Santa Fe, New Mexico, 87502

Dear Dr. Kelley:

On June 19, 1998, Mary Anne Sullivan, on behalf of the DOE, wrote Susan M. McMichael, Assistant General Counsel for NMED. In this letter DOE agreed to provide a written demonstration that the acceptable knowledge process that the Los Alamos National Laboratory used to characterize the TA-55-43 waste stream is equivalent to the conditions relating to the use of acceptable knowledge in the draft permit issued by NMED.

That demonstration is enclosed with this letter.

DOE appreciates NMED's willingness to work with us on this matter. We believe this demonstration will facilitate NMED's review of the waste characterization process for the TA-55-43 waste stream. We look forward to a successful resolution of this review.

Sincerely,

W. John Arthur, III
Assistant Manager for Office
of Environment/Project Management

Enclosure

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EQUIVALENCY BETWEEN DRAFT PERMIT PROVISIONS AND LOS ALAMOS WASTE CHARACTERIZATION

B4-1 Introduction

Draft Permit Attachment B4	QAPP	Los Alamos National Lab (LANL) Characterization
<p>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 NMAC 4.1) Subparts I through VI, Subpart VIII, and Subpart IX, authorize the use of acceptable knowledge (AK) as a method which can be used in appropriate circumstances by waste generators, or treatment, storage, or disposal facilities to make hazardous waste determinations. Acceptable knowledge is described in <i>Waste Analysis: EPA Guidance Manual for Facilities That Generate, Treat, Store and Dispose of Hazardous Waste</i> (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).</p>	<p>1.4</p>	<p>Acceptable knowledge was used to make hazardous waste determinations [see <i>Acceptable Knowledge Documentation</i> (TWCP-QP-1.1-021) and <i>Acceptable Knowledge Summary Report</i> (TWCP-1042)]. Acceptable knowledge was supplemented by sampling and analysis of all lots of the feed material used in the process generating the waste. Additional sampling and analysis of process intermediates was used to support process knowledge that chemical fractionation did not occur during processing. Data are presented and referenced in <i>Acceptable Knowledge Summary Report</i> (TWCP-1042).</p>

Draft Permit Attachment B4	QAPP	Los Alamos National Lab (LANL) Characterization
<p>Acceptable knowledge is one of a number of techniques used to characterize transuranic (TRU) mixed waste. It is used in conjunction with radiography and/or visual examination, headspace gas sampling and analysis, and solidified waste sampling and analysis (specified in Permit Attachment B1) to meet the requirements of the WIPP Waste Analysis Plan (WAP) specified in Permit Attachment B^a.</p>	<p>1.4 & 4.2.2</p>	<p>Radiography was used to verify waste materials and to verify absence of lead items and free liquids according to <i>Performing Non-destructive Testing using the Mobile Real/Time Radiography System</i>, TWCP-DTP-1.2-008. Results for TA-55-43 Lot No.01 (consisting of 36 drums) verified waste materials and absence of lead items and free liquids as reported in Batch Data Reports LA98-3.2.1-014 and -015. Radiography is also capable of identifying containers that would hold compressed gases and detected none. Any articles (such as closed cans) that could contain gases generated by radiolysis were located to ensure they were vented. Visual Examination was performed on five drums according to <i>Visual Examination Procedure for TWCP</i> (TWCP-DTP-1.2-001). Visual Inspection is being conducted on 100 percent of the waste stream during repackaging. Results on the repackaged drums are presented in Batch Data Report LA-98-RPK-001 (TWCP-1215). Headspace gas analysis was used to verify absence of volatile organic compounds at levels exceeding the PRQL according to <i>Calculation of UCL(90) Values for Headspace Gas VOC Total VOC, SVOC, and Metals Data</i> (TWCP-DTP-1.2-006). Headspace gas analysis results for TA-55-43 Lot No. 01 at the 90 percent confidence level are reported in Headspace Gas Analysis Summary (TWCP-1108). Headspace gas analysis results recalculated at the 95 percent confidence level (TWCP-1224) indicates the all mean concentrations remain below the PRQLs. Solidified waste sampling and analysis are not required for heterogeneous debris waste as specified in Permit Attachment B1.</p>

^a The provisions in the draft permit assume that they will be applied to the characterization of mixed waste streams only. The New Mexico Environment Department (NMED) has requested that the Department of Energy (DOE) demonstrate that the processes it used to characterize a non-mixed waste stream at LANL, TA-55-43, are equivalent to the draft permit's provisions for mixed wastes.

Draft Permit Attachment B4	QAPP	Los Alamos National Lab (LANL) Characterization
<p>Acceptable knowledge is used in TRU mixed waste characterization activities in three ways:</p> <ul style="list-style-type: none"> • To delineate TRU mixed waste streams • To determine if TRU mixed heterogeneous debris wastes exhibit a toxicity characteristic (20 NMAC 4.1.200, incorporating 40 CFR §261.24) • To determine if TRU mixed wastes are listed (20 NMAC 4.1.200, incorporating 40 CFR §261.31) 	1.4	<p>Acceptable knowledge was used in three ways as documented in Acceptable Knowledge Summary Report (TWCP-1042):</p> <ul style="list-style-type: none"> • To delineate TRU waste streams (page 10). • To determine if the waste exhibited a toxicity characteristic (pages 13–19). • To determine if the waste was listed (page 7).
<p>Acceptable knowledge is confirmed using nondestructive techniques, and sampling and analysis.</p>	4.2	<p>Acceptable knowledge was confirmed according to <i>Performing Non-destructive Testing using the Mobile Real/Time Radiography System</i> (TWCP-DTP-1.2-008). Results for TA-55-43 Lot No. 01 are reported in Batch Data Reports LA98-3.2.1-014 and -015 (TWCP-1109 and -1110) and are reconciled with acceptable knowledge information in TWCP-1217. Gamma spectroscopy of each repackaged drum to confirm correct Pu material type was performed according to <i>Determining Isotopic Ratios in Waste Containers using the RANT PC FRAM Assay System</i> (TWCP-DTP-1.2-029). The results for the repacked drums are presented in FRAM Batch Data Report, LA98-3.1.4-002 (TWCP-1220). The amount of Pu-238 for each repackaged drum (which confirms that RCRA metals in the waste are below regulatory limits) is measured according to <i>Waste Assay Using the Mobile Passive-Active Neutron (PAN) Assay System</i> (TWCP-DTP-1.2-009). The results for the repackaged drums are reported in PAN Batch Data Report, LA98-PAN-001 (TWCP-1213). Reconciliation of gamma spectroscopy and PAN data with acceptable knowledge information and calculation of the chromium content in each repackaged drum is reported in TWCP-1218. Waste sampling and analysis are not required for heterogeneous debris waste as specified in Permit Attachment B1^b.</p>

^b Many of the provisions in the draft permit apply only to newly generated waste streams, waste streams composed of homogeneous solids, or waste streams composed of soils and gravels. As TA-55-43 is a retrievably stored waste stream composed of heterogeneous debris, these provisions do not apply to it. However, for completeness, these provisions have been included and, where appropriate, this chart cites the documents that impose equivalent requirements on LANL for these types of waste streams (i.e., newly generated, homogeneous solids, or soils and gravel).

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<u>B4-2 Acceptable Knowledge Documentation</u>		
<p>The Permittees shall obtain from each Department of Energy (DOE) TRU mixed waste generator/storage site (site) a logical sequence of acceptable knowledge information that progresses from general facility information (TRU Mixed Waste Management Program Information) to more detailed waste-specific information (TRU Mixed Waste Stream Information). The consistent presentation of acceptable knowledge documentation among sites in auditable records¹ will allow Waste Isolation Pilot Plant (WIPP) personnel to verify the completeness and adequacy of acceptable knowledge for TRU mixed waste characterization during the audit process.</p>	4.2 & 4.3	<p>General Facility information is reported in the <i>LANL TRU Waste Characterization Sampling Plan</i> (TWCP-PLAN-0.2.7-001) and more detailed waste-specific information is prepared according to <i>Acceptable Knowledge Documentation</i> (TWCP-QP-1.1-021). Specific information for waste stream TA-55-43 Lot No. 01 is given in <i>Acceptable Knowledge Summary Report</i> (TWCP-1042).</p>
<p>¹ "Auditable records" mean those records which allow the Permittees to conduct a systematic assessment, analysis, and evaluation of the Permittees compliance with the WAP and this Permit.</p>	4.2.1, 4.3, & 4.5	<p>Auditable records for all characterization activities are maintained in the TWCP Records Management and Document Control Center according to <i>Records Management</i> (TWCP-QP-1.1-004) and the <i>TRU Waste Quality Management Plan</i> (TWCP-PLAN-0.2.6-001).</p>
<p>The Permittees shall implement the acceptable knowledge process as specified in this Permit.</p>	4.0	<p>The acceptable knowledge process is implemented in the procedure <i>Acceptable Knowledge Documentation</i> (TWCP-QP-1.1-021). Although supplemental information is optional in the QAPP (but required in the Draft RCRA permit), all supplemental information is available for waste stream TA-55-43 Lot No. 01.</p>
<p>NMED will participate in the audit process specified in Permit Attachment B6 to validate the implementation of acceptable knowledge.</p>	NA	<p>NMED participated in two audits (May 1997 and August 1997). NMED also is auditing LANL's characterization of waste stream TA-55-43 from June 18–July 2, 1998.</p>

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<p>The following sections include the required information that each site shall have to characterize TRU mixed waste using acceptable knowledge. Because waste generating processes are site-specific, sites shall supplement the required acceptable knowledge records with additional information (see Section B4-2c, Supplemental Acceptable Knowledge Information).</p>	<p>4 & 4.3</p>	<p>Required acceptable knowledge documents were used and are referenced in the Acceptable Knowledge Summary Report (TWCP-1042):</p> <ul style="list-style-type: none"> • Area and building from which the waste stream was generated; see page 4 • Waste stream volume and time period of generation; see page 6 • Waste generating process; see page 7 • Process flow diagrams; see Figs. 2, 3, and 4 • Material inputs or other information that identifies the chemical and radionuclide content of the waste stream and the physical waste form; see page 8 <p>Supplemental acceptable knowledge documents were used and are referenced in the Acceptable Knowledge Summary Report (TWCP-1042):</p> <ul style="list-style-type: none"> • Evaluation of processes to confirm that no hazardous constituents were introduced; see pages 13-19 • Safe operating procedures and waste management 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 were managed at the point of generation; see page 12 • Final safety analysis reports and technical safety requirements; see TWCP-415 • Waste packaging logs; see page 5 • Site databases; see page 13 • Research reports that describe reagents and raw materials used in experiments; see pages 13-19 • Information from site personnel; see pages 1-4, 13 and 15 • Previous analytical data related to the generation of this waste stream; see pages 13-19 • Vendor documents (e.g., material safety data sheets, handbooks, or reference materials); see page 7 • Reports, memos, or letters containing significant information related to waste generation; see pages 13-19 • Process design documents (e.g., Title II design) (maintained by generators) • Laboratory notebooks that detail the research process and raw material used in an experiment (maintained by generators)

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If the required information is not available for a particular heterogeneous Debris Waste (Summary Category S5000), then this waste will not be accepted for disposal at the WIPP facility as a retrievably stored waste.	4.3	All required and supplemental information was obtained as described above. Although all required and supplemental information is available, waste is being repackaged (to meet thermal limits) and bulk waste contents will be verified.

B4-2a Required TRU Mixed Waste Management Program Information

TRU mixed waste management program information shall clearly define waste categorization schemes and terminology, provide a breakdown of the types and quantities of TRU mixed 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.	4.3.1	All of this information is included in the <i>LANL TRU Waste Certification Sampling Plan (TWCP-PLAN-0.2.7-001)</i> and the <i>LANL TRU Waste Certification Plan (TWCP-PLAN-0.2.4-001)</i> .
Information related to TRU mixed waste certification procedures and the types of documentation (e.g., waste profile forms) used to summarize acceptable knowledge shall also be provided.	4.3.1	LANL waste profile forms for all 36 drums were provided. Waste certification procedures were provided (TWCP-697, -700, -701). Generator procedures relating to waste packaging and reporting were provided (TWCP-1219).
<p>The following information shall be included as part of the acceptable knowledge written record:</p> <ul style="list-style-type: none"> • Map of the site with the areas and facilities involved in TRU mixed waste generation, treatment, and storage identified • Facility mission description as related to TRU mixed 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 mixed waste at the site (e.g., plutonium recovery, weapons design, or weapons fabrication) • Waste identification or categorization schemes used at the facility (e.g., item description codes, content codes) • Types and quantities of TRU mixed 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 retrievably stored and newly generated wastes to be sent to the WIPP facility 	4.3.1	<p>This information is found in the Acceptable Knowledge Summary Report (TWCP-1042) as noted below:</p> <ul style="list-style-type: none"> • Map of the site is found in Figure 1. • The facility mission description is found on page 4. • Description of the operations that generate TRU waste is included in the LANL TRU Waste Characterization Sampling Plan (TWCP-PLAN-0.2.7-001). • Waste identification schemes are found on page 10. • Types and quantities of TRU waste generated are found on page 6. (Future projections are reported in the Baseline Inventory Report, DOE CAO-94-1005.) • Correlation of waste streams is found on page 10. • Waste certification procedures are referenced on page 8.

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B4-2b Required TRU Mixed Waste Stream Information

The Permittees may use acceptable knowledge to delineate site-specific waste streams.	1.4	LANL used acceptable knowledge to assign matrix parameter categories, to determine no EPA hazardous waste codes apply to this waste stream, to determine the waste material parameters and radionuclides present in the waste stream, and to assign TRUCON codes – thus acceptable knowledge was used to delineate waste streams.
For each TRU mixed waste stream, sites shall compile all process information and data that support the acceptable knowledge used to characterize that waste stream.	4.3.2	LANL has compiled all process information and data that support the acceptable knowledge used to characterize TA-55-43 Lot No. 01. This information is summarized in the Acceptable Knowledge Summary Report (TWCP-1042).
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.	4.3.2	For waste stream TA-55-43, the supporting documentation (mandatory and supplemental) is substantial. TWCP has 28 documents in the Records Center that support the Acceptable Knowledge Summary Report (TWCP-1042).
At a minimum, the waste process information shall include the following written information: <ul style="list-style-type: none"> • 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, if applicable) 	4.3.2	This information is found in the Acceptable Knowledge Summary Report (TWCP-1042) as noted below: <ul style="list-style-type: none"> • Areas and buildings are found on page 4. • Waste stream volume and time period of generation are found on page 6. • Waste generating process is found on page 7. • Process flow diagrams are found in Figures 2, 3 and 4. • Material inputs are found on page 8.

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Any retrievably stored heterogeneous Debris Waste stream (Summary Category S5000) shall be reclassified and managed as a newly generated waste stream if all required acceptable knowledge information is not available.	4.3	For this waste stream, all required acceptable knowledge information was available; therefore this requirement does not apply. Although all required and supplemental information is available, waste is being repackaged (to meet thermal limits) and bulk waste contents will be verified.
The acceptable knowledge written record shall include a summary that identifies all sources of waste characterization information used to delineate the waste stream.	4.3.2	A summary that identifies all sources of waste characterization information is contained in the Acceptable Knowledge Summary Report (TWCP-1042), Attachment 1, pages 21–23.
The basis and rationale for delineating each waste stream, based on the parameters of interest, shall be clearly summarized and traceable to referenced documents.	4.3.2	The basis and rationale for delineating TA-55-43 is summarized in the Acceptable Knowledge Summary Report (TWCP-1042), pages 4–5.
Assumptions made in delineating each waste stream also shall be identified and justified.	4.3.2	As stated in the Acceptable Knowledge Summary Report (TWCP-1042), page 5, delineation was based on waste physical form.
If discrepancies exist between required information, then sites shall apply all hazardous waste codes indicated by the information to the subject waste stream.	4.2.1, 4.3.3, 4.4.4, & 4.5	None of the information summarized in the Acceptable Knowledge Summary Report (TWCP-1042) indicated that hazardous waste codes apply to TA-55-43, Lot No. 01.
<p>The Permittees shall obtain from each site, at a minimum, procedures that comply with the following acceptable knowledge requirements:</p> <ul style="list-style-type: none"> • Procedures for identifying and assigning the physical waste form of the waste • Procedures for assigning a Waste Matrix Code to waste streams • Procedures for determining waste material parameters (i.e., physical waste form and properties) present in a waste stream • Procedures for resolving inconsistencies in acceptable knowledge documentation • Procedures for confirming acceptable knowledge information through headspace gas sampling and analysis; and solidified waste sampling and analysis • Procedures describing management controls used to ensure prohibited items (specified in the WAP, Permit Attachment B) are documented and managed as nonconforming items as specified in Permit Attachment B3 	4.2.1	<p>CAO has received copies of the following procedures, which show compliance with acceptable knowledge requirements:</p> <ul style="list-style-type: none"> • Procedures for identifying and assigning the physical waste form are in <i>Acceptable Knowledge Documentation</i> (TWCP-QP-1.2-021). • Procedures for assigning a Waste Matrix Code are in <i>Acceptable Knowledge Documentation</i> (TWCP-QP-1.2-021). • Procedures for determining waste material parameters are in <i>Acceptable Knowledge Documentation</i> (TWCP-QP-1.2-021). • Procedures for resolving inconsistencies are in <i>Acceptable Knowledge Documentation</i> (TWCP-QP-1.1-021). • Procedures for confirming acceptable knowledge information are in <i>Headspace Gas Sampling Using the Direct Sampling Method</i> (TWCP-DTP-1.2-017) and <i>Calculation of UCL(90) Values for Headspace Gas VOC Total VOC, SVOC, and Metals Data</i> (TWCP-DTP-1.2-006). Solidified waste sampling and analysis are not required for debris waste as specified in Permit Attachment B1.

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<ul style="list-style-type: none"> • Procedures to ensure radiography and visual examination procedures include a list of prohibited items that the operator shall verify are not present in each container of waste (corrosives, ignitables, reactives, and incompatible wastes) • 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 characterized waste shall describe how acceptable knowledge is confirmed using visual examination prior to waste packaging 		<ul style="list-style-type: none"> • Procedures describing management controls used to manage prohibited items are in <i>Nonconformances</i> (TWCP-QP-1.1-007), <i>Performing Nondestructive Testing Using the Mobile Real-Time Radiography System</i> (TWCP-DTP-1.2-008), and <i>Visual Examination Procedure for TWCP</i> (TWCP-DTP-1.2-001). • Procedures to ensure that the radiography and visual examination procedures include a list of prohibited items are in <i>LANL TRU Waste Characterization Quality Assurance Project Plan</i> (TWCP-PLAN-0.2.3-001). The procedures for radiography and visual examination are <i>Performing Nondestructive Testing Using the Mobile Real-Time Radiography System</i> (TWCP-DTP-1.2-008) and <i>Visual Examination Procedure for TWCP</i> (TWCP-DTP-1.2-001). • Procedures to document how changes to Waste Matrix Codes, waste stream assignment, and nonapplicability of EPA hazardous waste codes are documented in <i>Reconciliation of Waste Stream Information</i> (TWCP-QP-1.1-028). • Procedures describing how acceptable knowledge is confirmed is described in <i>Reconciliation of Waste Stream Information</i> (TWCP-QP-1.1-028).

B4-2c Supplemental Acceptable Knowledge Information

<p>The Permittees shall obtain supplemental acceptable knowledge information from the sites, and shall use this information to compile the acceptable knowledge written record.</p>	<p>4.3, 4.3.3, & 4.4.4</p>	<p>CAO obtained a copy of the Acceptable Knowledge Summary Report (TWCP-1042) and has access to all supplemental documentation through LANL and TWCP records.</p>
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Draft Permit Attachment B4	QAPP	Los Alamos National Lab (LANL) Characterization
<p>Supplemental acceptable knowledge documentation that shall be used (if available) in addition to the required information specified above include, but are not limited to, the following information:</p> <ul style="list-style-type: none"> • 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) • Previous analytical data relevant to the waste stream, including results from 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 (e.g., equivalent nonradioactive materials) • Laboratory notebooks that detail the research processes and raw materials used in an experiment 	4.3.3	<p>The supplemental acceptable knowledge information is either at TA-55 or is found in the TWCP Records Center, as noted below:</p> <ul style="list-style-type: none"> • Process design documents (maintained by TA-55). • Standard operating procedures at point of generation (TWCP-1219). • Final safety analysis report (TWCP-415). • Waste packaging logs (maintained by TA-55). • Description of raw materials (TWCP-1025, -1026, -1030, -1040). • Site database [site storage database (TA-54 database) and generator database (TA-55 database)]. • Information from site personnel (TWCP-698, -813, -815, -887, -934, -1037, -1045). • Vendor information (TWCP-565, -1027, -1198). • Previous analytical data (TWCP-1025, -1026, -1030, -1040). • Material Safety Data Sheets (TWCP-1027). • Sampling and analysis data of feedstock materials (TWCP-1025, -1026, -1030, -1040). • Laboratory notebooks (maintained by TA-55).
<p>All specific, relevant supplemental acceptable knowledge documentation, 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).</p>	4.3.3 & 4.4.4	<p>All relevant supplemental documentation is explained and referenced under the topic heading to which it applies in the Acceptable Knowledge Summary Report (TWCP-1042).</p>

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Supplemental documentation is required, if available, and shall be used to further document the rationale for the hazardous waste designations.	4.3, 4.3.3, & 4.4.4	All relevant supplemental information was used and documented in the Acceptable Knowledge Summary Report (TWCP-1042).
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.	4.3.3	Both required and supplemental information indicate that no hazardous waste codes apply to TA-55-43.
For example, if personnel interviews indicate that lead was part of the input materials, then D008 shall be designated in spite of the fact that no records of the use of lead exist in the required documentation.	4.3.3	Personnel interviews indicated that the waste stream TA-55-43 is non-hazardous.
Sites shall prioritize the sources of information used to assign hazardous waste codes in terms of accuracy of the information.	4.3.3	All information indicates that the waste stream TA-55-43 is non-hazardous. Thus, prioritization is not applicable.
Published documents and controlled databases are considered the most reliable information. Second priority will be given to unpublished data, internal procedures, and notes. Correspondence, such as memoranda, letters, telephone logs, and interviews are considered the least defensible.	4.3.3	This priority was used in the Acceptable Knowledge Summary Report (TWCP-1042). For example, published documents were used to obtain analysis data, databases were used to determine which drums belonged to the TA-55-43 Lot No. 01 waste stream, internal procedures were used to document processes that produced the waste, and interviews were used to corroborate the acceptable knowledge information.
The pages from large documents, such as safety analysis reports, shall be flagged with the relevant information noted.	4.3.3	Pages in large documents were flagged and also were referenced in the Acceptable Knowledge Roadmap, Attachment 1 of the Acceptable Knowledge Summary Report (TWCP-1042). Also see, for example, TWCP-415, the FSAR for TA-55.

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B4-3 Acceptable Knowledge Training, Procedures and Other Requirements

Consistency among sites in using acceptable knowledge information to characterize TRU mixed waste shall be ensured using a three phase process: 1) compiling the required and supplemental acceptable knowledge documentation in an auditable record, 2) confirming acceptable knowledge information using radiography and/or visual examination, headspace-gas sampling and analysis, and solidified waste sampling and analysis, and 3) auditing acceptable knowledge records.	4.2	<p>(1) See the Acceptable Knowledge Summary Report (TWCP-1042)</p> <p>(2) See the radiography batch data reports (TWCP-1109 and 1110), the visual examination batch data report (TWCP-1205), and the headspace gas analysis summary (TWCP-1108).</p> <p>(3) See the Carlsbad Area Office audit reports (TWCP-977 and -1125); these audits were attended by several observers from the New Mexico Environment Department, Environmental Protection Agency, Defense Nuclear Facility Safety Board, and Environmental Evaluation Group.</p>
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B4-3a Qualifications and Training Requirements

<p>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:</p> <ul style="list-style-type: none"> • WIPP WAP in Permit Attachment B and the Waste Acceptance Criteria specified in this permit • State and Federal RCRA regulations associated with solid and hazardous waste determinations • Nonconformance process, including discrepancy resolution and reporting • Site-specific procedures associated with waste characterization using acceptable knowledge 	4.4.1	For the Acceptable Knowledge Summary Report (TWCP-1042), the preparer, who is also the compiler, has all the specified training as described in Section 9.0, Training, in the procedure <i>Acceptable Knowledge Documentation</i> (TWCP-QP-1.1-021). This training is documented in site training records.
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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.	4.2 & 4.2.1	CAO has obtained a copy of the procedures <i>Acceptable Knowledge Documentation</i> (TWCP-QP-1.1-021) and <i>Reconciliation of Waste Stream Information</i> (TWCP-QP-1.1-028).
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<p>Site-specific acceptable knowledge procedures shall address the following:</p> <ul style="list-style-type: none"> • 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. The procedure shall describe that sites shall assemble and evaluate available documentation in the following priority: a) relevant information from published documents and controlled databases, b) unpublished data, internal procedures and notes, such as log books, and c) correspondence, such as memoranda, letters, telephone logs, and interviews. • Sites shall develop and implement a written procedure that describes the waste certification program and ensures unacceptable wastes (e.g., reactive, ignitable, corrosive) are identified and segregated from certifiable TRU mixed waste populations. • 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. Discrepancies in acceptable knowledge documentation shall be resolved by including all available information in the auditable records and assigning all hazardous waste codes indicated by all of these records to the subject waste. For example, if one record indicates that solvents were not part of a process, while another record indicates that 1,1,1-trichloroethane was used for cleaning parts, then the F001 hazardous waste code shall be applied to the waste. No judgments may be made regarding the quality of the required documentation, and the assignment of hazardous waste codes shall be tracked to all required documentation. 	<p>4.2.1 & 4.4.4</p>	<ul style="list-style-type: none"> • The written procedure outlining the specific methodology used to assemble acceptable knowledge records is provided as the Acceptable Knowledge Roadmap [see Section 6.4 of <i>Acceptable Knowledge Documentation</i> (TWCP-QP-1.1-021)]. • The written procedure describing the assembly and evaluation of available documentation is provided in Section 6.1 of <i>Acceptable Knowledge Documentation</i> (TWCP-QP-1.1-021) for assembly of the documentation and Section 6.2 of <i>Acceptable Knowledge Documentation</i> (TWCP-QP-1.1-021) for evaluation of the data. • The written procedure describing the waste certification program and ensuring unacceptable wastes are identified and segregated from certifiable TRU mixed waste populations is described in the <i>LANL TRU Waste Certification Plan</i> (TWCP-PLAN-0.2.4-001). • The written procedure evaluating acceptable knowledge and resolving discrepancies is provided in Section 6.2 of <i>Acceptable Knowledge Documentation</i> (TWCP-QP-1.1-021). • Discrepancies in acceptable knowledge documentation are resolved by including all available information in the auditable records and assigning all hazardous waste codes indicated by all of these records to the subject waste as required in Section 6.2 of <i>Acceptable Knowledge Documentation</i> (TWCP-QP-1.1-021). • The written procedure to identify hazardous wastes and to assign the appropriate hazardous waste codes is part of <i>Acceptable Knowledge Documentation</i> (TWCP-QP-1.1-021). For newly generated wastes, the procedures are developed and implemented to make hazardous waste determinations using acceptable knowledge prior to packaging the waste as referenced in the generator TRU Waste Interface Documents and required by the <i>LANL TRU Waste Certification Plan</i> (TWCP-PLAN-0.2.4-001). • The confirmation of acceptable knowledge is described in <i>Reconciliation of Waste Stream Information</i> (TWCP-QP-1.1-028).

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<ul style="list-style-type: none"> • Sites shall prepare and implement a written procedure in compliance with Section B4-3(d) to identify hazardous wastes and assign the appropriate hazardous waste codes to each waste stream. For newly generated wastes, procedures shall be developed and implemented to make hazardous waste determinations using acceptable knowledge prior to packaging the waste. • Sites shall develop and implement a written procedure for the confirmation of acceptable knowledge in accordance with Section B4-3(d). 		
<ul style="list-style-type: none"> • 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. • Sites shall develop and implement written procedures to compile adequate documentation to demonstrate consistency in assigning hazardous waste codes and to defend and justify the use of acceptable knowledge making hazardous waste determinations to independent auditors. The following are minimum baseline requirements/standards that site-specific procedures shall include to ensure comparable and consistent identification of hazardous waste: <ul style="list-style-type: none"> ⇒ Compile all of the required information in an auditable record. ⇒ Review the required information to determine if the waste is listed under 20 NMAC 4.1.200 (incorporating 40 CFR §261), Subpart D. Assign all listed hazardous waste codes. ⇒ Review the required information to determine if the waste may contain hazardous constituents included in the toxicity characteristics specified in 20 NMAC 4.1.200 (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 is available from the sampling and analysis of a representative sample of the waste stream that demonstrates that the concentration of the constituent in the waste is less than the toxicity characteristic regulatory level, no judgment may be made regarding the concentration 	4.2.1 & 4.5	<ul style="list-style-type: none"> • A procedure that provides a cross reference to the applicable waste summary category group to verify all of the required confirmation data has been evaluated and the proper hazardous waste codes have been assigned is provided in Sections 6.2.6–6.2.14 of <i>Acceptable Knowledge Documentation</i> (TWCP-QP-1.1-021). • The baseline requirements are contained in the procedure <i>Acceptable Knowledge Documentation</i> (TWCP-QP-1.1-021) in the sections referenced below: <ul style="list-style-type: none"> ⇒ Sections 5.7 and 7.0 require the information to be placed in an auditable record. ⇒ Section 6.2.8 requires review of information to determine listed waste. ⇒ Section 6.2.8 requires review of information to determine toxicity characteristics. For TA-55-43, sampling and analysis data for process material and process intermediates and assay analysis of the Pu-238 can be and were used to calculate the concentrations of toxicity characteristic metals, as explained in the <i>Acceptable Knowledge Summary Report</i> (TWCP-1042). Sampling and analysis of headspace gas calculated at the 95 percent confidence level indicated that mean concentrations of all VOCs remain below the PRQLs. The sampling and analysis data from the waste stream indicates that no constituents exceeded the regulatory limits for toxicity. This is in agreement with draft permit provision on the potential toxicity characteristics for base materials that compose TRU heterogeneous debris waste.

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<p>of the constituent. When analytical data is not available, the toxicity characteristic hazardous waste code for the identified hazardous constituent shall be applied to the waste stream.</p> <p>⇒ In the case of discrepancies in information, no judgment may be made regarding the quality of the information. Sites shall ensure that all potential hazardous waste codes are assigned to the waste stream.</p> <ul style="list-style-type: none"> • Sites shall ensure that results of other audits of the TRU mixed waste characterization programs at the site are available in the records. 		<p>⇒ Section 6.2.8 requires that all potential hazardous codes be assigned to the waste stream. For waste stream TA-55-43 no discrepancies existed which would require assignment of hazardous waste codes.</p> <ul style="list-style-type: none"> • Reports of other audits are maintained according to <i>Records Management</i> (TWCP-QP-1.1-004).
<p>Furthermore, the Permittees shall require the sites to implement waste certification procedure(s) which specify the administrative controls used by the site to ensure that prohibited items are documented and managed in accordance with site-specific certification plans.</p>	4.2.1	<ul style="list-style-type: none"> • The administrative controls used to ensure that prohibited items are documented and managed are described in the LANL TRU Waste Characterization Quality Assurance Project Plan (TWCP-PLAN-0.2.3-001) and the LANL TRU Waste Certification Plan (TWCP-PLAN-0.2.4-001).
<p>The following minimum elements shall be addressed in site-specific documentation associated with administrative controls:</p> <ul style="list-style-type: none"> • Identify the organization(s) responsible for compliance with administrative controls. • Identify the oversight procedures and frequency of actions to verify compliance with administrative controls. • Develop on-the-job training specific to administrative control procedures. • Ensure that personnel may stop work if noncompliance with administrative controls is identified. • Develop a nonconformance process that complies with the requirements in Section B3-13 of the WAP to document and establish corrective actions. • As part of the corrective action process, assess the potential time frame of the noncompliance, the potentially affected waste population(s), and the reassessment and recertification of those wastes. 	4.4.2	<ul style="list-style-type: none"> • Organizations are identified in Sections 5.5 and 5.6 of <i>Acceptable Knowledge Documentation</i> (TWCP-QP-1.1-021). • Oversight procedures are identified in Sections 5.2 and 5.4 of <i>Acceptable Knowledge Documentation</i> (TWCP-QP-1.1-021). • On-the-job training is described in the specific TWCP Training Plans and <i>TWCP Training Procedure</i> (TWCP-QP-1.1-003). • Personnel may stop work as detailed in <i>Work Suspensions</i> (TWCP-QP-1.1-030). • A nonconformance process is detailed in <i>Nonconformances</i> (TWCP-QP-1.1-007) and <i>Corrective Action Reporting</i> (TWCP-QP-1.1-008). • The potential time frame of the noncompliance, the potentially affected waste population(s), and the reassessment and recertification of those wastes are addressed in accordance with <i>Corrective Action Reporting</i> (TWCP-QP-1.1-008) and <i>Reconciliation of Waste Stream Information</i> (TWCP-QP-1.1-028).

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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.	Figure 4-1	Figure 1 in <i>Acceptable Knowledge Documentation</i> (TWCP-QP-1.1-021) addressed all aspects of Figure B4-1 except the flow diagram on "compiling documentation into an auditable file." The diagram on compiling documentation into an auditable file is being done in accordance with <i>Reporting Summarized Characterization Data and Waste Stream Summaries to CAO</i> (TWCP-QP-1.1-024).
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.	4.2.1	All of the required acceptable knowledge information and supplemental information regarding the materials and processes that generate a specific waste stream are assembled in accordance with Sections 6.1.1-6.1.2 in <i>Acceptable Knowledge Documentation</i> (TWCP-QP-1.1-021).
<p>The Permittees shall require the sites to implement procedures which comply with the following criteria to establish acceptable knowledge records:</p> <ul style="list-style-type: none"> • Acceptable knowledge information shall be compiled in an auditable record, including a road map for all applicable information. • The overview of the facility and TRU mixed 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. 	4.2.1	<p>LANL requires the following items as detailed in the <i>Acceptable Knowledge Documentation</i> (TWCP-QP-1.1-021):</p> <ul style="list-style-type: none"> • Acceptable knowledge information shall be compiled in an auditable record, including a road map for all applicable information; see Section 6.2.1. • The overview of the facility and TRU mixed waste management operations in the context of the facility's mission shall be correlated to specific waste stream information; see Section 6.2.2. • Correlations between waste streams, with regard to time of generation, waste generating processes, and site-specific facilities shall be clearly described; see Sections 6.2.3 and 6.2.5. • A reference list shall be provided that identifies documents, databases, Quality Assurance protocols, and other sources of information that support the acceptable knowledge information; see Section 6.4. <p>LANL has implemented these items for waste stream TA-55-43 in the <i>Acceptable Knowledge Summary Report</i> (TWCP-1042).</p>
Container inventories for TRU mixed waste currently in retrievable storage shall be delineated into waste streams by correlating the container identification to all of the required acceptable knowledge information and any supplemental acceptable knowledge information.	4.2.1	Preliminary delineation of the storage inventory into waste streams is provided in the <i>LANL TRU Waste Characterization Sampling Plan</i> (TWCP-PLAN-0.2.7-001). As more in-depth acceptable knowledge information is obtained, the Sampling Plan waste stream populations are updated.

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B4-3d Requirements for Confirmation of Acceptable Knowledge Information

Acceptable knowledge includes information regarding the physical form of the waste, the base materials composing the waste, and the process that generates the waste.	4.0	This information is given in the Acceptable Knowledge Summary Report (TWCP-1042), pages 5-8.
Waste characterization (i.e., radiography or visual examination, headspace-gas sampling and analysis, and solidified waste sampling and analysis) will be used to confirm acceptable knowledge information.	4.2.2	LANL is required to perform radiography, visual examination, and headspace gas sampling and analysis to confirm acceptable knowledge information in accordance with <i>Reconciliation of Waste Stream Information</i> (TWCP-QP-1.1-028). Solidified waste sampling and analysis are not required for debris waste as specified in Permit Attachment B1.
Figure B4-2 illustrates the process sites will use to confirm acceptable knowledge.	Figure 4-2	LANL's process for confirmation of acceptable knowledge [delineated in <i>Reconciliation of Waste Stream Information</i> (TWCP-QP-1.1-028)] is consistent with Figure B4-2.
Acceptable knowledge characterization results shall be confirmed for both retrievably stored and newly generated waste.	1.4, 4.0, 5.0 & 5.2	Acceptable knowledge characterization of TA-55-43 Lot No. 01 is confirmed by radiography (TWCP-1217), headspace gas analysis (TWCP-1108 & 1224), radioassay (TWCP-1218), and visual inspection during repackaging (TWCP-1216).
All retrievably stored waste shall be characterized using radiography to confirm the Waste Matrix Code and waste stream and certify compliance with the WAP (Permit Attachment B).	1.4 & 5.2	LANL has completed radiography on 100% of the 36 drums in TA-55-43 Lot No. 01. This information has been reconciled with acceptable knowledge in accordance with <i>Reconciliation of Waste Stream Information</i> (TWCP-QP-1.1-028). The results can be found in TWCP-1217.
If a site must repackage its retrievably stored waste, then visual examination of the waste during repackaging shall be used to confirm acceptable knowledge information rather than radiography.	5.2 & 5.4.3	The repackaging records for TA-55-43 Lot No. 01 are equivalent to the visual examination records; the only difference is the repackaging process was not videotaped. The results of repackaging can be found in Batch Data Report LA98-RPK-001 (TWCP-1215). Reconciliation of repackaging results and acceptable knowledge information is in TWCP-1216.
For newly generated wastes, sites shall have written procedures to document the confirmation of acceptable knowledge information with visual examination prior to or during waste packaging.	4.2.1	This waste is retrievably stored waste; therefore, this requirement does not apply. The repackaging records for TA-55-43 Lot No. 01 are equivalent to the visual examination records; the only difference is the repackaging process was not videotaped. The results of repackaging can be found in Batch Data Report LA98-RPK-001 (TWCP-1215).

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<p>The following minimum requirements shall be addressed in site-specific procedures:</p> <ul style="list-style-type: none"> • 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 determinations; • rate and quantity of the hazardous waste generated; • list of applicable operating procedures relevant to the hazardous waste determination; • nonconformance reporting; • process knowledge verification sampling (i.e., headspace-gas sampling and/or solidified waste annual sampling); and • reporting and records management. 	4.2.1	This waste is retrievably stored waste; therefore, this requirement does not apply.
<p>Sites shall establish procedures for reevaluating acceptable knowledge if radiography or visual examination results in the assignment of a different Waste Matrix Code [e.g., Plastic/Rubber (S5310) versus Paper/Cloth (S5330)].</p>	4.2.1	<p>The <i>Reconciliation of Waste Stream Information</i> (TWCP-QP-1.1-028) (Section 9.0) addresses the reevaluation of acceptable knowledge if radiography or visual examination results in the assignment of a different Waste Matrix Code.</p>
<p>Site procedures shall describe how the waste is reassigned, acceptable knowledge reevaluated, and appropriate hazardous waste codes assigned.</p>	4.2.1	<p>The <i>Reconciliation of Waste Stream Information</i> (TWCP-QP-1.1-028) (Section 9.0) describes how waste is reassigned, acceptable knowledge reevaluated, and appropriate hazardous waste codes assigned.</p>
<p>Potential toxicity characteristics for base materials that compose TRU mixed heterogeneous debris (S5000) waste may be determined without destructive sampling and analysis via acceptable knowledge.</p>	4.2.2.1	<p><i>Acceptable Knowledge Documentation</i> (TWCP-QP-1.1-021) provides for the determination of toxicity characteristics via acceptable knowledge.</p>
<p>Sites will assign a Waste Matrix Code to each container of waste using acceptable knowledge.</p>	4.2.1	<p><i>Acceptable Knowledge Documentation</i> (TWCP-QP-1.1-021) (Section 6.2.6) requires assignment of the Waste Matrix Code.</p>
<p>In lieu of sampling and analytical 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.</p>	4.2.2.1	<p>For TA-55-43, sampling and analysis data for process material and process intermediates and assay analysis of the Pu-238 can be used to calculate the concentrations of toxicity characteristic metals, as explained in the <i>Acceptable Knowledge Summary Report</i> (TWCP-1042). The hazardous constituents were calculated to be present below the regulatory limits and therefore the codes were not assigned to this waste. Headspace gas analysis confirmed that VOCs are not present in concentrations above the regulatory limits.</p>

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Radiography or visual examination shall be used to confirm the Waste Matrix Code identified using acceptable knowledge.	4.2.2.1	The Waste Matrix Code is confirmed according to <i>Reconciliation of Waste Stream Information</i> (TWCP-QP-1.1-028) (Sections 7.1.4 and 7.4).
Procedures shall describe how discrepancies in the Waste Matrix Code are recorded and additions to hazardous waste codes based on material composition are documented, as necessary (Section B4-3b).	4.2.1	Discrepancies in the Waste Matrix Code are recorded as described in <i>Reconciliation of Waste Stream Information</i> (TWCP-QP-1.1-028) (Section 7.1.4.5) and additions to hazardous waste codes based on material composition are documented in <i>Acceptable Knowledge Documentation</i> (TWCP-QP-1.1-021) (Section 6.2.8).
<p>If a waste must be assigned to a different Waste Matrix Code based on radiography or visual examination, the following minimum steps shall be taken to reevaluate acceptable knowledge:</p> <ul style="list-style-type: none"> • 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 acceptable knowledge 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 reassigned Waste Matrix Code was generated within the specified time period, area and buildings, waste generating process, and that the process material inputs are consistent with the waste material parameters identified during radiography or visual examination • Record all changes to acceptable knowledge records • If discrepancies exist in the acceptable knowledge information for the reassigned Waste Matrix Code, complete a nonconformance report (Permit Attachment B3), document the segregation of this container, and define the corrective actions necessary to fully characterize the waste 	4.4.5	<p>The following minimum steps are taken to reevaluate acceptable knowledge in accordance to <i>Reconciliation of Waste Stream Information</i> (TWCP-QP-1.1-028):</p> <ul style="list-style-type: none"> • Existing information based on the container identification number is reviewed and all differences in hazardous waste code assignments are documented in accordance with Sections 9.1 and 9.5. • All required acceptable knowledge information associated with the new designation is reassessed in accordance with Section 9.5. • All sampling and analytical data associated with the waste is reassessed and documented in accordance with Section 9.5. • The Waste Matrix Code is reassigned in accordance with Section 9.1. • All changes to acceptable knowledge records are documented in accordance with Section 9.3. • A nonconformance report documenting the segregation of this container and defining the corrective actions necessary to fully characterize the waste discrepancies for the reassigned Waste Matrix Code is completed in accordance with Section 9.2.
Headspace gas sampling and analysis shall be conducted on all TRU mixed waste to be sent to the WIPP facility.	4.2.2.2	LANL conducted headspace gas sampling and analysis on all of the original containers of waste in waste stream TA-55-43 Lot No. 01. Headspace gas analysis results recalculated at the 95 percent confidence level (TWCP-1224) indicates the all mean concentrations remain below the PRQLs.

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<p>Headspace gas data will be used to confirm the presence or absence of volatile organic compounds (VOCs) identified using acceptable knowledge.</p>	4.2.2.2	<p>Headspace gas analysis was used to verify absence of volatile organic compounds at levels exceeding the PRQL according to <i>Calculation of UCL(90) Values for Headspace Gas VOC Total VOC, SVOC, and Metals Data</i> (TWCP-DTP-1.2-006). Headspace gas analysis results for TA-55-43 Lot No.01 are reported in Headspace Gas Analysis Summary (TWCP-1108). Headspace gas analysis results recalculated at the 95 percent confidence level (TWCP-1224) indicates the all mean concentrations remain below the PRQLs.</p>
<p>Sites shall use acceptable knowledge to identify spent solvents associated with each TRU mixed waste stream or waste stream lot.</p>	4.2.2.2	<p>Acceptable knowledge clearly shows that no solvents were used in TA-55-43 Lot No. 01, as documented in the Acceptable Knowledge Summary Report (TWCP-1042). Headspace gas analysis results recalculated at the 95 percent confidence level (TWCP-1224) confirms this.</p>
<p>Headspace-gas data will be used to confirm acceptable knowledge concerning the presence or absence of F-listed solvents.</p>	4.2.2.2	<p>Headspace gas analysis was used to verify absence of F-listed solvents at levels exceeding the PRQL according to <i>Calculation of UCL(90) Values for Headspace Gas VOC Total VOC, SVOC, and Metals Data</i> (TWCP-DTP-1.2-006). Headspace gas analysis results for TA-55-43 Lot No.01 are reported in Headspace Gas Analysis Summary (TWCP-1108). Headspace gas analysis results recalculated at the 95 percent confidence level (TWCP-1224) indicates the all mean concentrations remain below the PRQLs.</p>
<p>Sites shall provide documentation to support any determination that organic constituents are associated with packaging materials or other uses not consistent with solvent use.</p>	4.2.2.2	<p>Documentation is referenced in the Acceptable Knowledge Summary Report (TWCP-1042). See also Analysis of Literature Review on Radiolytically Generated Volatile Organic Compounds (VOCs), LAUR-98-2383 (TWCP-1211). Headspace gas analysis results recalculated at the 95 percent confidence level (TWCP-1224) indicates the all mean concentrations remain below the PRQLs.</p>
<p>If the source of the detected solvents cannot be identified, the appropriate spent solvent hazardous waste code will be conservatively applied to the waste stream.</p>	4.2.2.2	<p>No solvents were used in the generation of waste stream TA-55-43 Lot No. 01, as described in the Acceptable Knowledge Summary Report (TWCP-1042). LANL believes all VOCs detected are a result of radiolysis or off-gasing from tape, packaging, plastics, Tygon, or rubber materials (TWCP-1211). Headspace gas analysis results for TA-55-43 Lot No. 01 are reported in Headspace Gas Analysis Summary (TWCP-1108). Headspace gas analysis results recalculated at the 95 percent confidence level (TWCP-1224) indicates the all concentrations of the VOCs remain below the PRQLs.</p>

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Hazardous wastes associated with S3000 and S4000 waste streams will be verified based on the results of the total analysis of a representative solidified waste sample.	4.2.2.2	Solidified waste sampling and analysis are not required for debris waste as specified in Permit Attachment B1.
If discrepancies between the results obtained from solidified waste sampling and analysis and headspace-gas sampling and analysis exist (i.e., a VOC is detected in the solidified waste but not in the headspace), the most conservative results will be used to verify acceptable knowledge and assign hazardous waste codes.	4.2.2.2	Solidified waste sampling and analysis are not required for debris waste as specified in Permit Attachment B1.
Sites shall confirm the assignment of spent solvent hazardous waste codes (20 NMAC 4.1.200, incorporating 40 CFR §261.31) by evaluating the average concentrations of each VOC detected in container headspace gas and/or solidified waste matrix for each waste stream or waste stream lot using the upper 95 percent confidence limit (UCL₉₅).	4.2.2.2	LANL initially confirmed this using the 90% UCL according to the <i>Calculation of UCL(90) Values for Headspace Gas VOC Total VOC, SVOC, and Metals Data</i> (TWCP-DTP-1.2-006). LANL reconfirmed this using the 95 percent UCL; there are no solvents detected above the PRQLs (TWCP-1224) using either calculation of the UCL.
The UCL ₉₅ for the mean concentration shall be compared to the program required quantitation limit (PRQL) for the constituent.	4.2.2.2	This was done at the 90% UCL following <i>Calculation of UCL(90) Values for Headspace Gas VOC Total VOC, SVOC, and Metals Data</i> (TWCP-DTP-1.2-006). A subsequent evaluation at UCL(95) was done and there are no solvents detected above the PRQLs (TWCP-1224).
If the UCL ₉₅ for the mean concentration exceeds the PRQL, sites shall reevaluate their acceptable knowledge information and determine the potential source of the constituent.	4.2.2.2	This was done at the 90% UCL following <i>Calculation of UCL(90) Values for Headspace Gas VOC Total VOC, SVOC, and Metals Data</i> (TWCP-DTP-1.2-006). A subsequent evaluation at UCL(95) was done and there are no solvents detected above the PRQLs (TWCP-1224).
If the source of the constituent is identified as a spent solvent used in the process or is determined to be the result of mixing a listed waste with a solid waste during waste packaging, then the site will either: 1) assign the applicable listed hazardous waste code to the entire waste stream, or 2) segregate the drums containing detectable concentrations of the solvent into a separate waste stream and assign applicable hazardous waste codes.	4.2.2.2	Not applicable to waste stream TA-55-43.
Each site shall document, justify, and consistently delineate waste streams and assign hazardous waste codes based on site-specific permit requirements and other state-enforced agreements.	4.2.2.2	Assignment of hazardous waste codes is based on site-specific permit requirements and the codes are assigned in accordance with <i>Acceptable Knowledge Documentation</i> (TWCP-QP-1.1-021) and <i>Reconciliation of Waste Stream Information</i> (TWCP-QP-1.1-028).

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To determine the mean concentration of solvent VOCs, all headspace gas data and solidified waste data for a waste stream or waste stream lot (i.e., the portion of the waste stream that is characterized as a unit) will be used, including data qualified with a 'J' flag (i.e., less than the PRQL but greater than the method detection limit [MDL]) or qualified with a 'U' flag (i.e., undetected).	4.2.2.2	Requirement was implemented as stated in <i>Calculation of UCL(90) Values for Headspace Gas VOC Total VOC, SVOC, and Metals Data</i> (TWCP-DTP-1.2-006).
For data qualified with a 'U' flag, sites shall use one-half the MDL in calculating the mean concentration.	4.2.2.2	Requirement is implemented as stated in <i>Calculation of UCL(90) Values for Headspace Gas VOC Total VOC, SVOC, and Metals Data</i> (TWCP-DTP-1.2-006).
Because listed wastes are not defined based on concentration, sites may not remove hazardous waste codes assigned using acceptable knowledge if hazardous constituents are not detected in the headspace.	4.2.2.2	This requirement is implemented in accordance with <i>Acceptable Knowledge Documentation</i> (TWCP-QP-1.1-021). Waste stream TA-55-43 did not have any listed waste codes.
TRU mixed headspace gases and solidified waste matrices may contain one or two constituents (e.g., carbon tetrachloride and 1,1,1-trichloroethane) at concentrations that are orders of magnitude higher than the other target analytes. In these cases, samples shall be diluted to remain within the instrument calibration range.	4.2.2.2	This requirement is implemented in accordance with <i>Calculation of UCL(90) Values for Headspace Gas VOC Total VOC, SVOC, and Metals Data</i> (TWCP-DTP-1.2-006). Headspace gas constituents at high concentrations were not present in waste stream TA-55-43 Lot No. 01.
Sample dilution results in elevated MDLs. Only the concentrations of detected constituents will be used to calculate the mean for the purpose of assigning F-listed hazardous waste codes.	4.2.2.2	This requirement is implemented in accordance with <i>Headspace Gas Sampling Using the Direct Sampling Method</i> (TWCP-DTP-1.2-017). Sample dilution was not required in the analysis of waste stream TA-55-43 Lot No. 01.
Because the presence or absence of F-listed solvents can not be confirmed based on the artificially high MDLs that are caused by sample dilution, data flagged as 'U' and showing an elevated MDL will not be used in calculating the mean concentration.	4.2.2.2	Sample dilution was not required in the analysis of waste stream TA-55-43 Lot No. 01.

B4-3e Acceptable Knowledge Data Quality Requirements

Analytical results will be used to confirm the characterization of wastes based on acceptable knowledge.	4.2 & 4.2.2	For TA-55-43, sampling and analysis data for process material and process intermediates and assay analysis of the Pu-238 can be used to calculate the concentrations, as explained in the <i>Acceptable Knowledge Summary Report</i> (TWCP-1042). The hazardous constituents are present below the regulatory limits and therefore the codes were not assigned to this waste. Headspace gas analysis was used to confirm absence of solvents for waste stream TA-55-43 Lot No. 01.
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<p>To ensure that the acceptable knowledge process is consistently applied, sites shall comply with the following data quality requirements for acceptable knowledge documentation:</p> <ul style="list-style-type: none"> • 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 and 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 required information (Section B4-2). The usability 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. 	4.1	<ul style="list-style-type: none"> • Precision – As stated, precision requirements are not established for acceptable knowledge. • Accuracy – Reassignment and tracking of waste matrix code for containers is described in <i>Reconciliation of Waste Stream Information</i> (TWCP-QP-1.1-028). <p>Reconciliation of acceptable knowledge and sampling and analysis data is described in Section 7.6 of <i>Reconciliation of Waste Stream Information</i> (TWCP-QP-1.1-028). The percentage of containers assigned different hazardous waste codes based on sampling and analysis will be reported when characterization is completed.</p> <ul style="list-style-type: none"> • Completeness – All of the required information is maintained at LANL. • Comparability – Training to requirements is accomplished according to <i>TWCP Training Procedures</i> (TWCP-QP-1.1-003). Hazardous waste codes are assigned according to <i>Calculation of UCL(90) Values for Headspace Gas VOC Total VOC, SVOC, and Metals Data</i> (TWCP-DTP-1.2-006) and Section 7.6 of <i>Reconciliation of Waste Stream Information</i> (TWCP-QP-1.1-028). • Representativeness – Minimum standards for the acceptable knowledge documentation process are ensured by following <i>Acceptable Knowledge Documentation</i> (TWCP-QP-1.1-021). The limitations of acceptable knowledge references are required to be listed in Attachment 1 of that procedure.

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<ul style="list-style-type: none"> • 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 B3-b. 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). 		
<p>Each site shall address quality control by tracking its performance with regard to the use of acceptable knowledge by: 1) assessing the frequency of inconsistencies among information, and 2) documenting the results of acceptable knowledge confirmation through radiography or visual examination, headspace-gas analyses, and solidified waste analyses.</p>	2.1.2.1, 2.1.3, & 4.2.2	Inconsistencies among information are tracked, documented, and reconciled through <i>Reconciliation of Waste Stream Information</i> (TWCP-QP-1.1-028).
<p>In addition, the acceptable knowledge process and waste stream documentation shall be evaluated through internal assessments by quality assurance organizations and assessments by auditors or observers external to the organization (i.e., DOE/Carlsbad Area Office (CAO), NMED, EPA).</p>	2.1.5 & 4.5	The acceptable knowledge process and documents were audited internally by the Audits and Assessments Group (AA-2) and externally by CAO, with observers from New Mexico Environment Department, Environmental Protection Agency, Federal Nuclear Facility Safety Board, Environmental Evaluation Group as documented in TWCP-977 and -1125. NMED also is auditing LANL's characterization of waste stream TA-55-43 from June 18–July 2, 1998.

B4-3f Audits of Acceptable Knowledge

<p>The Permittees will conduct an initial audit of each site prior to certifying the site for shipment of TRU mixed waste to the WIPP facility.</p>	4.5	CAO conducted three audits of LANL TRU waste program prior to authorizing LANL to characterize, certify, and ship TRU waste to WIPP. These audits were A-97-01 (May 12-16, 1997), A-97-07 (August 18-22, 1997), and A-97-16 (September 10-11, 1997).
<p>This initial audit will establish an approved baseline that will be reassessed annually by the Permittees.</p>	4.5	The approved baseline was established on September 12, 1997 with a certification letter from CAO to LANL (CAO:NTP:RAS 97-1875 UFC 5822).

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These audits will verify compliance with the requirements specified in the WAP (Permit Attachment B).	4.5	Audits A-97-01, -07, and -16 were conducted in accordance with Carlsbad Area Office Procedure MP 10.3 that requires a program adequacy (proper flow-down or incorporation of all requirements from upper tier program documents to implementing procedures) determination be made. At the conclusion of Audit A-97-16 LANL's Program was determined to be adequate.
The audits will be used to verify compliance with the compilation, application, and interpretation requirements of acceptable knowledge information specified in this Permit at all sites, and to evaluate the completeness and defensibility of site-specific acceptable knowledge documentation related to hazardous waste determinations.	4.5	<p>The acceptable knowledge program was assessed during audits A-97-01 and A-97-07 these audits included verification of compliance with program requirements for acceptable knowledge information compilation, application, and interpretation and an evaluation of acceptable knowledge information and completeness related to hazard waste determination was made. The following are some of the characteristics taken from the acceptable knowledge checklists used for the acceptable knowledge audits of the LANL program:</p> <ul style="list-style-type: none"> ⇒ Verify that the acceptable knowledge documentation was collected per procedure. ⇒ Verify that conclusions reached in the acceptable knowledge documentation are adequate to support the documented intended use. ⇒ Verify that the acceptable knowledge documentation contained in the acceptable knowledge documentation summary report is sufficient to support to support the conclusion. ⇒ Verify that all reasonable sources of AK were evaluated for inclusion in the final documentation. ⇒ Verify that the following parameters are assigned to each specific waste stream: matrix parameter; waste material parameter; EPA hazardous waste numbers. <p>All concerns identified in these areas were addressed and closed.</p>
Permit Attachment B6 gives a description of the overall audit program and a required checklist.	NA	All audits leading to the certification of LANL were conducted in accordance with a standard operation procedure (CAO MP 10.3) and used site-specific checklists based on LANL's approved Quality Assurance Project Plan (QAPjP) and the detailed technical and quality procedures identified therein, as required in the draft permit (completed checklists are on file at CAO). The incorporation of the requirements established by the CAO QAPP in LANL's QAPjP and procedures was received and found to be satisfactory. These requirements included all applicable items identified in the checklist from Table B6-1.

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<p>Figure B4-3 includes the primary steps associated with the audit process of acceptable knowledge.</p>	<p>Figure 4-3</p>	<p>Figure B4-3 is reflected in Figure 4-3 of the QAPP that was followed in the audit of LANL acceptable knowledge program. CAO determined that LANL had met all program requirements this was indicated in the audit report for audit A-97-16, which states "The audit team concluded that the QA program is being satisfactorily implemented in accordance with LANL procedures. The team determined that implementing procedures are adequate (proper flow-down or incorporation of all requirements from upper tier program documents to implementing procedures). The LANL technical program was determined to be effective."</p>
<p>Site-specific audit plans will be prepared by the Permittees and provided to NMED, and will identify the scope of the audit, requirements to be assessed, participating personnel, activities to be audited, organizations to be notified, applicable documents, and schedule.</p>	<p>NA</p>	<p>Site specific audit plans were prepared for the LANL TRU waste program audits that contained scope of the audit, governing documents and requirements, participating team members, activities to be audited, and schedule of activities. The audit plans were provided to NMED. See CAO:NTP:DEW:97-1821UFC 2300.</p>
<p>Audits will be performed in accordance with written procedures and site-specific checklists that will be developed by the Permittees prior to the audit and provided to NMED.</p>	<p>NA</p>	<p>The LANL TRU waste program audits were performed in accordance with CAO Management Procedure MP 10.3. CAO developed site specific checklist prior to the audits and provided them to NMED at the audits.</p>
<p>The site-specific audit checklists will include items associated with the compilation and evaluation of the required acceptable knowledge information as specified in the checklist required by Permit Attachment B6.</p>	<p>NA</p>	<p>The acceptable knowledge audit checklists prepared for the LANL TRU waste program audits contained items associated with compilation and evaluation of required acceptable knowledge information (see above item 4). Checklists in Permit Attachment B6 were not available for audits.</p>

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<p>Audit checklists shall include all of the following elements for review during the audit:</p> <ul style="list-style-type: none"> • Documentation of the process used to compile, evaluate, and record acceptable knowledge is available and implemented; • Personnel qualifications and training are documented; • All of the required acceptable knowledge documentation specified in Section B4-2 has been compiled in an auditable record; • All of the required procedures specified in B4-3 have been developed and implemented, including but not limited to: <ul style="list-style-type: none"> ⇒ A procedure exists for assigning hazardous waste codes to waste streams in accordance with Section B4-3; ⇒ A procedure exists for resolving discrepancies in acceptable knowledge documentation in accordance with Section B4-3; ⇒ A procedure exists for confirming acceptable knowledge information through: a) radiography or visual examination, b) headspace gas sampling and analysis, and c) solidified waste sampling and analysis in accordance with Section B4-3; and • Results of other audits of the TRU mixed waste characterization programs at the site are available in site records. 	4.5	Elements included here are reflected in Section 4.5 of the QAPP. Elements were included in checklist used during LANL TRU waste certification audits.
<p>Members of the audit team will be knowledgeable regarding the required acceptable knowledge information, RCRA regulations and EPA guidance regarding the use of acceptable knowledge for waste characterization, RCRA hazardous waste determinations, and the WAP requirements (Permit Attachment B).</p>	4.5	Qualifications of all members of the acceptable knowledge audit team were evaluated against these requirements as reflected in QAPP Section 4.5. Resumes of all team members are on file.
<p>Audit team members will be independent of all TRU mixed waste management operations at the site being audited.</p>	4.5	Team members for the LANL TRU waste program audits were determined to be independent of all TRU waste operations at LANL. Resumes of all team members are on file.

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<p>Auditors will evaluate all documents associated with the evaluation of the acceptable knowledge documentation for at least one heterogeneous debris waste stream and one solidified waste stream during the audit.</p>	4.5	<p>The audit team evaluated only heterogeneous debris waste streams at the LANL audits as LANL was only seeking certification for debris waste. When LANL seeks to expand their certification to include solidified waste, these waste streams will be evaluated.</p>
<p>For these waste streams, auditors will review all procedures and associated processes developed by the site for documenting the process of compiling acceptable knowledge documentation; correlating information to specific waste inventories; assigning hazardous waste codes; and identifying, resolving, and documenting discrepancies in acceptable knowledge records.</p>	4.5	<p>The acceptable knowledge audit team reviewed all procedures and processes associated with the LANL acceptable knowledge process in preparation for the LANL TRU waste program audits. The procedures reviewed included: <i>Acceptable Knowledge Documentation</i> (TWCP-QP-1.1-021), <i>Nonconformances</i> (TWCP-QP-1.1-007), <i>Visual Examination for the TWCP</i> (TWCP-DTP-1.2-001), <i>Performing Non-Destructive Testing Using the Mobile Real-Time Radiography System</i> (TWCP-DTP-1.2-008), <i>Reconciliation of Waste Stream Information</i> (TWCP-QP-1.1-028). Completed audit checklists are on file.</p>
<p>The adequacy of acceptable knowledge procedures and processes will be assessed and any deficiencies in procedures documented in the audit report.</p>	4.5	<p>The adequacy of LANL acceptable knowledge procedures and processes were assessed by the acceptable knowledge audit team and were found to be satisfactory as reflected in the audit report for audit A-97-16 which states "The audit team concluded that the QA program is being satisfactorily implemented in accordance with LANL procedures. The team determined that implementing procedures are adequate (proper flow-down or incorporation of all requirements from upper tier program documents to implementing procedures). The LANL technical program was determined to be effective.</p>
<p>Auditors will review the acceptable knowledge documentation for selected waste streams for logic, completeness, and defensibility.</p>	4.5	<p>The acceptable knowledge audit team reviewed selected waste streams documentation for logic, completeness, and defensibility during the conduct of the LANL TRU waste program audits. The team determined that the LANL acceptable knowledge process was satisfactory. Audit reports and completed checklist are on file.</p>

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<p>The criteria that will be used by auditors to evaluate the logic and defensibility of the acceptable knowledge documentation include completeness and traceability of the information, consistency of application of information, clarity of presentation, degree of compliance with this Permit Attachment with regard to acceptable knowledge confirmation data, nonconformance procedures, and oversight procedures.</p>	4.5	<p>Criteria identified here are reflected in the QAPP Section 4.5 and were used by the acceptable knowledge audit team to evaluate the logic and defensibility of the acceptable knowledge documentation. The team determined that the LANL acceptable knowledge process was satisfactory. Audit reports and completed checklist are on file.</p>
<p>Auditors will evaluate compliance with written site procedures for developing the acceptable knowledge record.</p>	4.5	<p>The acceptable knowledge audit team evaluated LANL's compliance with their site procedures for developing the acceptable knowledge record. The implementation of their procedures was found to be satisfactory as indicated in the audit report for A-97-16, which states "The audit team concluded that the QA program is being satisfactorily implemented in accordance with LANL procedures corresponding to the scope of this audit."</p>
<p>A completeness review will evaluate the availability of all required TRU mixed waste management program information and TRU mixed waste stream information (Section B4-2).</p>	4.5	<p>A completeness review was conducted by the acceptable knowledge audit team of all required TRU waste management and waste stream information, as evidenced by the following characteristic from the acceptable knowledge documentation checklist: "Verify that the acceptable knowledge documentation includes a roadmap for all applicable information, giving source, summary, location, and limitation of the information." The audit team determined that all required information was in place and properly roadmapped. Completed audit checklists are on file.</p>
<p>Records will be reviewed for correlation to specific waste streams and the basis for making hazardous waste determinations.</p>	4.5	<p>The audit team reviewed records to determine if the proper hazardous waste determination were being applied to specific waste streams. The audit team determined that the EPA hazard waste codes were not being consistently applied with the requirements of the QAPP; CAR 97-114 was issued. On September 11, 1997 CAO verified that LANL had successfully completed the corrective action for this CAR and that sufficient information was presented to determine that the correlations (hazard waste numbers to waste streams) were appropriately determined and utilized. CAR closure letter CAO:NTP:DEW 97-1882 UFC 2300 is on file.</p>

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Auditors will verify that sites include all required information and conservatively include all potential hazardous waste codes indicated by the acceptable knowledge records.	4.5	The audit team verified that the LANL included all required information and all appropriate hazard waste numbers. This was verified through closure of CAR 97-114.
All deficiencies in the acceptable knowledge documentation will be included in the audit report.	4.5	All deficiencies in the acceptable knowledge documentation were included in the audit reports for audits A-97-01, A-97-07, and A-97-16. NMED was provided with copies of these reports.
Auditors will verify and document that sites use administrative controls and follow written procedures to make hazardous waste determinations for newly-generated and retrievably stored wastes.	4.5	The audit team verified that LANL used administrative controls and followed written procedures to make hazardous waste determinations. This process was deemed satisfactory by the audit team with the closure of CAR 97-114.
Auditors will review procedures used by the sites to confirm acceptable knowledge information using radiography or visual examination, headspace gas sampling and analysis, and solidified waste sampling and analysis.	4.5	The audit team reviewed LANL procedures used to confirm acceptable knowledge using RTR, VE, and HSGS. LANL procedures were found to be satisfactory as evidenced by the audit report for A-97-16 which states that the team determined that implementing procedures are adequate (proper flow-down or incorporation of all requirements from upper tier program documents to implementing procedures).
Procedures to document changes in acceptable knowledge documentation and additions to hazardous waste code assignments to specific waste streams also will be evaluated for compliance with the WAP (Permit Attachment B).	4.5	The audit team reviewed procedures to assign, change, and add hazardous waste numbers to waste streams during the LANL TRU waste program audits including a review of TWCP-813 (changes to EPA codes in TRU waste storage data base) and found the process to be satisfactory with closure of CAR 97-114.
After the audit is complete, the Permittees will provide the site with preliminary results at a close-out meeting.	4.5	The audit team leader provided the sites with a preliminary determination at the conclusion of each LANL audit as required in CAO MP-10.3.
The Permittees will prepare a final audit report that includes all observations and findings identified during the audit.	4.5	Final reports for audits A-97-01, A-97-07, and A-97-16 identified all observations and findings of these audits. NMED was provided copies of these reports.
Sites shall respond to all audit findings and identify corrective actions.	4.5	LANL responded to all audit findings for audits A-97-01, A-97-07, and A-97-16. CAO reviewed and accepted LANL's CAR closure plans and verified that all corrective actions were completed. CAR closure letters are on file.
Audit results will be available from the Permittees for review by NMED and other regulatory agencies, and copies will be provided upon request.	NA	Copies of all LANL audit reports were provided to NMED.

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If acceptable knowledge procedures do not exist, the required information is not available, or findings of noncompliance are identified associated with acceptable knowledge compilation, acceptable knowledge confirmation and/or hazardous waste determinations, the Permittees will not grant the site waste characterization and certification authority for the subject waste summary category.	4.5	The audit team assessed LANL acceptable knowledge program and determined that satisfactory procedures existed, the required information existed and that the LANL acceptable knowledge process was satisfactory as evidenced by the audit reports for audits A-97-01, A-97-07, and A-97-16.
Waste stream summary category characterization and certification authority will be revoked or suspended if findings during subsequent annual audits indicate a lack of compliance with approved acceptable knowledge procedures.	4.5	LANL acceptable knowledge process was found to be in compliance with approved acceptable knowledge procedures as evidenced by audit reports A-97-01, A-97-07, and A-97-16.
Waste characterization and certification authority will not be reinstated until the site demonstrates all corrective actions have been implemented and the program is reassessed by the Permittees.	4.5	LANL certification authority has not been suspended or revoked.
The National TRU Program disseminates information regarding TRU mixed waste characterization requirements and program status through the TRU Waste Characterization Interface Working Group. Sites use the CAO electronic bulletin board to disseminate information to other sites regarding TRU mixed waste streams, RCRA compliance, and operational and programmatic issues, methods development, and waste characterization information, including the application of acceptable knowledge.	NA	The TRU Waste Interface Working Group is active and CAO disseminates information concerning waste characterization requirements and program status through this group and the TRU Waste Steering Committee. The CAO electronic bulletin board is developed and operational and provides TRU waste and WIPP information to the sites
The Permittees are provided the required waste characterization information prior to waste acceptance at WIPP and also will conduct audits at least annually.	2.1.1, 4.5, & WAC 3.1.5	Audits A-97-01, A-97-07, and A-97-1 led to the entail certification of LANL on September 12, 1997. The recertification audit is scheduled for August 24, 1998.
The Permittees will maintain an operating record for review during regulatory agency audits. Regulatory agencies including NMED may also review any information relevant to the scope of the audit during site audits.	NA	CAO maintains an operating record that is available for review during audits. Any relevant information is available to NMED during site audits.
The Permittees will notify NMED regarding any site's failure to implement corrective actions associated with hazardous waste determinations as specified in Modules I and II and Permit Attachment B3.	4.4.4	LANL has not failed to implement corrective actions associated with hazard waste determinations as is evidenced by closure of CAR 97-114.

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B4-4 Additional Final Confirmation of Acceptable Knowledge at the WIPP Facility

Confirmation of acceptable knowledge characterization designations will be accomplished at the site, as stated in Section B4-3(b).	4.2 & 4.3	LANL acceptable knowledge characterization designations were confirmed as part of the waste stream profile review. The designations were found satisfactory as evidenced by CAO approval of LANL WSPF LA-TA-55-43 Lot No. 01.
In addition and prior to notifying a site that a waste stream can be shipped and accepted at the WIPP facility, the Permittees will review the Waste Stream Profile Forms and associated data packages to ensure that radiography or visual examination, headspace-gas sampling and analysis data, and solidified waste sampling and analysis data confirm hazardous waste determinations made using acceptable knowledge.	3.3.2 & WAC 3.1.5	LANL WSPF LA-TA-55-43 Lot No. 01 was reviewed and approved by CAO.
Sites shall provide all of the required data associated with waste stream characterization, including radiography or visual examination, headspace gas sampling and analysis, and solidified waste sampling and analysis results.	3.4.2 & WAC 3.1.5	CAO determined that LANL made the correct hazard waste determination for WSPF LA-TA-55-43 Lot No. 01 by approving this WSPF.
In addition, sites will designate the assigned hazardous waste codes for the waste stream on the waste profile form.	WAC 3.1.5 and App. B	CAO reviewed the data packages associated with WSPF LA-TA-55-43 Lot No. 01 and determined that the proper hazard waste determination was made for this waste stream.
The data packages will be evaluated as illustrated in Figure B4-2 and compared to the hazardous waste codes specified on the waste stream profile form.	Figure 4-2 & WAC 3.1.5	CAO reviewed the data packages associated with WSPF LA-TA-55-43 Lot No. 01 and determined that the proper hazard waste determination was made for this waste stream.
The Permittees will review information provided by the sites to ensure that additions to hazardous waste codes are identified and justified based on data and that hazardous waste codes are included in the Part A of the WIPP permit application.	NA	No additions to the hazard waste determination were required for this waste stream.
As part of the reconciliation of data quality objectives (DQOs) (Permit Attachment B3-11), sites are required to track and report additions to hazardous waste determinations.	2.1.2.1, 2.2, & 4.4.5	No discrepancies with acceptable knowledge information were identified for this waste stream.

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If data consistently indicates that discrepancies with acceptable knowledge information were identified at the site level (and were subsequently reconciled), the Permittees will require sites to increase sampling, reassess the materials and processes that generate the waste, and resubmit waste stream profile information to reduce the need for reconciliation activities.	4.4.4	CAO review and approval of WSPF LA-TA-55-43 Lot No. 01 revealed no nonconformance with acceptable knowledge requirements.
If the Permittees' review of a waste stream profile form and associated waste characterization data reveal nonconformance with acceptable knowledge requirements, the Permittees shall prohibit shipment of the waste stream to WIPP until corrective action is taken as specified in Permit Attachment B3.	2.1.2.1 & WAC 3.1.5	CAO review and approval of WSPF LA-TA-55-43 Lot No. 01 revealed no nonconformance with acceptable knowledge requirements
Repeated nonconformances by a site in implementing and documenting WAP requirements (Permit Attachment B) will result in the termination of a site's waste characterization and waste certification authority by the Permittees.	4.4.4	CAO review and approval of WSPF LA-TA-55-43 Lot No. 01 revealed no nonconformance with acceptable knowledge requirements.
Waste characterization and certification authority will not be reinstated by the Permittees until the site demonstrates all corrective actions have been implemented and the program is reassessed by the Permittees.	4.4.4	No discrepancies involving any drum associated with hazardous waste determination has been identified.
Any drum with unresolved discrepancies associated with hazardous waste determinations will not be shipped to the WIPP facility until the discrepancies are resolved.	4.4.4	No discrepancies involving any drum associated with hazardous waste determination has been identified.
Sites shall reassess the materials and processes that generate the waste, and headspace-gas sampling and analysis, radiography or visual examination, and solidified waste sampling and analysis results.	4.4.4	No discrepancies involving any drum associated with hazardous waste determination has been identified.
All shipments of the subject waste stream will cease until the corrective action(s), as necessary, have been implemented and the discrepancy resolved.	4.4.4	LANL certification authority has not been revoked.
The Permittees will notify NMED when the certification status of a waste stream at a site is revoked.	4.4.4	LANL certification authority has not been revoked.
Waste characterization and certification authority will not be reinstated until the site demonstrates all corrective actions have been implemented and the program is reassessed by the Permittees.	4.4.4	No discrepancies involving any drum associated with hazardous waste determination have been identified.

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Figure B4-1	Figure 4-1	
Figure B4-2	Figure 4-2	
Figure B4-3	Figure 4-3	