ATTACHMENT C6

AUDIT AND SURVEILLANCE PROGRAM

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AUDIT AND SURVEILLANCE PROGRAM

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ATTACHMENT C6

AUDIT AND SURVEILLANCE PROGRAM

C6-1 Introduction

The Waste Isolation Pilot Plant (**WIPP**) Audit and Surveillance Program shall ensure that: 1) the operators of each generator/storage site (**site**) and U.S. Department of Energy (**DOE**) approved laboratory that plan to transport transuranic (**TRU**) mixed waste to the WIPP facility conduct sampling and analysis of wastes in accordance with the current WIPP Waste Analysis Plan (**WAP**) (Permit Attachment C), and 2) the information supplied by each site to satisfy the waste screening and acceptability requirements of Section C-4 of the WAP is being managed properly. DOE will conduct these audits and surveillances at each site and DOE approved laboratory performing these activities in accordance with a standard operating procedure (**SOP**). NMED personnel may observe these audits and surveillances to validate the implementation of WAP requirements (Permit Attachment C) at each site and DOE approved laboratory. Only personnel with appropriate U.S. Department of Energy clearances will have access to classified information during audits. Classified information will not be included in audit reports and records. The audit SOP will contain steps for selecting audit personnel, reviewing applicable background information, preparing an audit plan, preparing audit checklists, conducting the audit, developing an audit report, and following up audit deficiencies. A deficiency is any failure to comply with an applicable provision of the WAP. The checklists for each site and DOE approved laboratory shall include, at a minimum, the appropriate checklists found in Tables C6-1 through C6-6 for the summary category groups undergoing audit.

C6-2 Audit Procedures

Audit procedures shall establish the responsibilities and methodology for planning, scheduling, performing, reporting, verifying, and closing announced and unannounced audits of sites and DOE approved laboratories. Records of all audit activities shall be part of the WIPP Operating Record and maintained at the WIPP facility until closure. NMED shall be provided unlimited access to these records.

Approved procedures shall be used to describe audit activities and requirements. Procedures define the responsibilities of specific positions necessary to manage this audit program. The DOE manager who oversees the audit program shall ensure that the following tasks are performed:

- Schedule audits
- Designate lead auditor(s)
- Appoint auditor and lead auditor trainees
- Maintain auditor training and qualification records
- Assure that all auditors have been given appropriate training, including training on the WAP

- Assign auditors and lead auditors to perform annual certification audits
- Review and approve final audit reports
- Oversee tracking and closure of all deficiencies and any observations requiring action
- Assure records are entered into the WIPP Operating Record and are properly maintained until facility closure

C6-3 Audit Position Functions

DOE will approve lead auditors, auditors, and technical specialists based upon the expertise required for the functions being examined according to the audit scope. DOE will supply auditors/technical specialists with expertise in the Resource Conservation and Recovery Act (**RCRA**) requirements and knowledge of the analysis and documentation methods required to verify the hazardous waste characterization performed by the sites. DOE shall identify all audit team members to NMED prior to the audit, and shall provide upon request the qualifications of all audit team members.

The lead auditor assigned to be the audit team leader must perform the following tasks:

- Concur that assigned auditors and technical specialists have the collective experience and training commensurate with the scope, complexity, or special nature of the activities to be audited
- Develop an audit plan and coordinate the preparation of an overall checklist to cover the scope of the audit, with consideration given to all nonconformances reported as specified in Permit Attachment C3 and to previous audit results from that site or DOE approved laboratory
- Assign specific audit areas to individual auditors and technical specialists within their particular specialty and provide guidance on checklist development
- Review individual auditor checklists to assure complete coverage of assigned scope, and approve the checklists
- Conduct the audit at the site or DOE approved laboratory
- Encourage observers to participate according to the protocol established by DOE
- Communicate audit results at the conclusion of the audit, including any deficiencies and observations
- Prepare and sign the audit report
- Maintain complete records of each audit and transfer them to the manager when the audit report is issued

Auditors and technical specialists assigned to the specific audit will report to the audit team leader for supervision and may perform the following tasks:

- Attend any required specific training and team orientation and planning meetings as directed by the audit team leader
- Prepare specific audit checklists to verify that the WAP Quality Assurance Objectives (**QAO**) are met for the areas being audited
- Obtain audit team leader approval of checklist
- Review acceptable knowledge documentation packages, test report data, and documentation of data verification activities
- Obtain and evaluate objective evidence by means of observation, document reviews, or the conduct of interviews with operators, analysts, technicians, and others necessary to determine the adequacy and effective implementation of the WAP
- Conduct inspection tours of waste generating stations, sampling areas and equipment, analytical laboratories, calibration facilities, administrative, and document control/record facility
- Complete checklist during the audit indicating the objective evidence observed verifies that the site or DOE approved laboratory has met the QAOs for the program elements, methods, and the activities being audited. Add other items to the checklist as they are observed or as needed during the audit
- Prepare narrative statements for all deficiencies, and observations that clearly and concisely identify the conditions involved
- Prepare any portion of the final audit report assigned by the lead auditor.

Audits will be conducted at least annually for each site involved in the waste characterization program. Both announced and unannounced audits will address the following:

- Results of previous audits
- Changes in programs or operations
- New programs or activities being implemented
- Changes in key personnel

Annual certification audits shall address contact-handled (**CH**) and remote-handled (**RH**) waste characterization activities if the site has approval or is seeking approval for such wastes. At a minimum, the audit shall evaluate acceptable knowledge documentation for CH and RH waste separately by Summary Category Group, as applicable.

C6-4 Audit Conduct

The conduct of the audit shall commence with an entrance meeting, conducted by the audit team leader, with site or DOE approved laboratory management. At this meeting, the audit objectives and scope, the specific areas to be audited, the processes or functions to be

observed, and the site or DOE approved laboratory-participation required, including site interfaces, will be identified. The purpose of this meeting is to confirm the audit scope, discuss the audit sequence, establish channels of communication, and confirm the daily and exit meeting. Audits shall be performed using approved audit checklists that include the checklists in Tables C6-1 to C6-6 for the summary category groups undergoing audit. Consistency of evaluation shall be ensured before the audit through site or DOE approved laboratory QAPjP approval (see Permit Attachment C5). QAPjPs for each site or DOE approved laboratory shall incorporate the same requirements from the WAP. Objective evidence shall be examined (to the depth necessary) to determine if the identified activities, procedures, or QAOs are adequate and are being effectively implemented.

Audits may not include all waste summary category groups, and thus some audit checklists or portions of checklists (Tables C6-1 through C6-6) may not be applicable to some sites or DOE approved laboratory (e.g., headspace gas sampling and analysis is not used because debris waste is not being analyzed by the site). In these instances, DOE shall indicate nonapplicability in the appropriate checklist row, and justify the exclusion under the “Comment” column. In addition, in cases where discrepancies exist between the audit checklists in Tables C6-1 through C6-6 and the Permit, Permit requirements take precedence. DOE may add to the checklists as necessary to clarify Permit requirements, but any additions will be clearly designated on the checklists (i.e., redline the additions).

Audits shall include site personnel interviews, document and record reviews, observations of operations, and any other activities deemed necessary by the auditors to meet the objectives of the audit. Observations or deficiencies identified during the audit will be investigated or evaluated, as necessary, to determine if they are isolated conditions or represent a general breakdown of the waste characterization quality assurance program. During audit interviews or audit meetings, site or DOE approved laboratory personnel may be advised of deficiencies identified within their areas of responsibility to establish a clear understanding of the identified condition.

The site or DOE approved laboratory personnel will be given the opportunity to correct any deficiency that can be corrected during the audit period. Deficiencies and observations will be documented and included as part of the final audit report. Those items that have been resolved during the audit (isolated deficiencies that do not require a root cause determination or actions to preclude recurrence), will be verified prior to the end of the audit, and the resolution will be described in the audit report. Those items that affect the quality of the program, and/or the data generated by that program, which are required by the WAP will be documented on a Corrective Action Report (**CAR**) and included as a part of the final audit report. The CAR will be entered into DOE’s CAR tracking system and tracked until closure. RCRA-related items will be uniquely identified within the CAR tracking system so that they can be tracked separately. RCRA-related CARs identified by the site or DOE approved laboratory during self-audits will be evaluated during DOE’s audit and surveillance program and tracked in DOE’s tracking systems.

When a deficiency is identified by the audit team, the audit team member who identified the deficiency prepares the CAR. DOE reviews the CAR, determine validity (assures that a requirement has in fact been violated), classify the significance of the deficiency, assign a response due date, and issue the CAR to the site or DOE approved laboratory. The site or DOE approved laboratory reviews the CAR, evaluates the extent and cause of the deficiency, and provides a response to DOE indicating the remedial actions and actions taken to preclude recurrence. DOE reviews the response from the site or DOE approved laboratory and, if

acceptable, communicate the acceptance to the site or DOE approved laboratory. The site or DOE approved laboratory completes remedial actions and actions to preclude recurrence. After all corrective actions have been completed, DOE may schedule and perform a verification visit to assure that corrective actions have been completed and are effective. NMED personnel may participate as observers in these verification visits. When all actions have been completed and verified as being effective, the CAR is closed by the DOE manager responsible for quality assurance. As part of the planning process for subsequent audits and surveillances, past deficiencies will be reviewed and the previous deficient activity or process is subject to reassessment.

NMED may submit a written Observer Inquiry to DOE if necessary to seek resolution to a question raised or issue posed during the audit. DOE shall be responsible for obtaining a response to the Observer Inquiry and submitting a written response to NMED within 30 days of inquiry submission. NMED will examine the response and consider this information as part of the audit review and approval process.

The sites or DOE approved laboratories shall submit corrective action plans to eliminate the deficiency stated on the CAR, including a resolution of the acceptability of any data generated prior to the resolution of the corrective action.

The corrective action response will include a discussion of the investigation performed to determine the extent and impact of the deficiency, a description of the remedial actions taken, determination of root cause, and actions to preclude recurrence.

An exit meeting will be conducted by the lead auditor prior to departure of the audit team from the site or DOE approved laboratory. This meeting will include site or DOE approved laboratory management personnel, and may include DOE field office personnel. All draft audit results will be presented to the site or DOE approved laboratory management.

The audit report will be prepared, approved, and issued to the site or DOE approved laboratory within 30 days of the completion of the audit by DOE. NMED shall receive a copy of the audit report upon issuance for information purposes. A formal final audit report will be provided to NMED which will include WAP-related CAR resolution results and audit results that will include, as a minimum, sections describing the scope, purpose, summary of deficiencies, and observations in narrative format, completed audit checklists, audited procedures, and other applicable documents which provide evidence of WAP implementation. The report will also include an identification of the organization audited, the dates of the audit, and the requested response date. NMED will make the final audit report available for public review and comment. One copy of the formal final audit report shall be submitted to NMED in hard copy, but any additional copies may be submitted in electronic format. The audited site or DOE approved laboratory will respond to any deficiencies and observations within (30 days after receipt of any CARs and indicate the corrective action taken or to be taken. If the corrective action has not been completed, the response must indicate the expected date the action will be completed. CARs applicable to WAP requirements shall be resolved prior to waste shipment. Subsequent audits or specific verifications, announced or unannounced, will determine if the corrective action has been satisfactorily implemented. Deficiencies (items corrected during the audit [CDAs] and CARs) and observations will be tracked to completion according to established procedure(s). In addition, deficiencies will be trended to determine if similar situations exist system wide. Trend reports will be issued as necessary to provide a “lessons learned” announcement to other sites or DOE approved laboratories who might benefit from program

improvements implemented as a result of resolutions to the specific situations discovered at the performance of these audits.

The final audit report provided to NMED and audit records will be maintained at WIPP as a part of the Operating Record. These records will be included on the Record Inventory and Disposition Schedule and maintained on-site until closure of the WIPP facility. NMED shall be provided unlimited access to these records.

TABLES

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Table C6-1 Waste Analysis Plan (WAP) Checklist

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1

Waste Analysis Plan (WAP) General Checklist for use at DOE'S Generator/Storage Sites

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
	Waste Stream Identification					
1	Does the generator/storage site define "waste stream" as waste material generated from a single process or from an activity that is similar in material, physical form, and hazardous constituents? (Attachment C Section C-0a)					
2	Are procedures in place to ensure that the generator/storage site assigns one of the Summary Category Groups (S3000-homogeneous solids, S4000-soils/gravel, S5000-debris waste) to each waste stream? (Section C-1b)					
3	Are procedures in place to ensure that the generator/storage site assigns Waste Matrix Code Groups (e.g., solidified inorganics, solidified organics, salt waste, soils, combustible waste, filters, graphite, heterogeneous debris waste, inorganic nonmetal waste, lead/cadmium metal, uncategorized metal) to each waste stream? (Section C-0a)					
4	Are procedures in place to ensure that the generator/storage site assigns a Waste Stream WIPP Identifier (ID) to each waste stream? (Section C3-12b(1))					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
4a	Are procedures in place for generator/storage sites to submit an AK Sufficiency Determination (Determination Request) to the Permittees to meet all or part of the waste characterization requirements including: • All information specified in Permit Attachment C4, Section C4-3d • Identification of relevant hazardous constituents, and correctly identifies all toxicity characteristic and listed hazardous waste numbers • All hazardous waste number assignments must be substantiated by supporting data and, if not, whether this lack of substantiation compromises the interpretation • Resolution of data discrepancies between different AK sources must be technically correct and documented • The AK Summary includes all the identification of waste material parameter weights by percentage of the material in the waste stream, and determinations are technically correct • All prohibited items specified in the TSDF-WAC should be addressed, and conclusions drawn are technically adequate and substantiated by supporting information • If the AK record includes process control information specified in Permit Attachment C4, Section C4-3b, the information should include procedures, waste manifests, or other documentation demonstrating that the controls were adequate and sufficient. • The site must provide the supporting information necessary to substantiate technical conclusions within the Determination Request, and this information must be correctly interpreted. (Section C-0b, Section C4-3d)					
4b	If a generator/storage site does not submit a Determination Request or if the Determination Request is not approved, are procedures in place for the generator/storage site to perform radiography or VE on 100% of the containers in a waste stream and chemical sampling and analysis on a representative sample of the waste stream using headspace gas sampling and analysis (for debris waste) or solids sampling and analysis (for homogeneous solid or soil/gravel waste) as specified in Permit Attachments C1 andC2? (Section C-0b)					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
4c	Are procedures in place to ensure that the generator/storage sites complete a Waste Stream Profile Form (WSPF) and Characterization Information Summary (CIS) as specified in Permit Attachment C3, Sections C3-12b(1) and C3-12b(2)? (Section C-0c)					
5	Are procedures in place to ensure that the generator/storage site divides waste streams into waste stream lots if all of the waste within a waste stream is not accessible for sampling and analysis, as required, at one time? If so, is the division of waste streams into waste stream lots based on staging, transportation and handling issues? (Section C-1a)					
6	Are procedures in place to ensure that the generator/storage site assigns EPA hazardous waste numbers associated with the waste? If so, do these assigned EPA hazardous waste numbers correspond to the permitted EPA hazardous waste numbers in Table C-9? Are there any assigned EPA hazardous waste numbers that are not permitted EPA hazardous waste numbers on the Table C-9? If so, did the generator/storage site reject the waste for shipment to and disposal at WIPP? Did the generator assign a state hazardous waste codes or numbers? If so, is it assigned to waste that is permitted at WIPP? (Section C-1b)					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
7	Are procedures in place to ensure that Summary Category Groups are defined as follows: S3000- Homogeneous solids are solid material, inorganic process residues, inorganic sludges, salt waste, and pyrochemical salt waste excluding soils, that do not meet NMED criteria for classification as debris and are at least 50 percent by volume homogeneous solids or comprise the majority of the waste stream S4000- Waste streams that are at least 50 percent by volume soil/gravel, or comprise the majority of the waste stream S5000- Waste streams that are at least 50 percent volume materials that meet the NMED criteria for debris, or comprise the majority matrix of materials. The criteria for debris are solid materials intended for disposal that exceed 2.36 inch particle size and is a manufactured object, plant or animal matter, or natural geologic material. Particles smaller than 2.36 inches in size may be considered debris if the debris is a manufactured object and if it is not a particle of S3000 or S4000 material. (Section C-0a)					
8	Does the generator/storage facility have procedures in place to ensure that the following waste characterization parameters will be obtained : • Determination whether TRU mixed waste streams comply with the applicable provisions of the TSDF-WAC • Determination whether TRU mixed wastes exhibit a hazardous characteristic per 20.4.1.200 NMAC (incorporating 40 CFR 261 Subpart C) • Determination whether TRU mixed wastes are listed per 20.4.1.200 NMAC (incorporating 40 CFR 261 Subpart D) • Estimation of waste material parameter weights (Section C-2)					
9	Are procedures in place to ensure that waste streams identified to contain incompatible materials or materials incompatible with waste containers cannot be shipped unless treated to remove the incompatibility? (Section C-1c)					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
10	Are procedures in place to ensure that the generator/storage site uses acceptable knowledge and, as necessary, headspace-gas sampling and analysis, radiography, visual examination, and homogeneous waste sampling and analysis as specified in Table C-5? (Section C-3)					
	Unacceptable Waste					

12	Are procedures in place to ensure that the generator/storage site ensures, through administrative and operational procedures and characterization techniques, that waste containers do not include the following unacceptable waste:
	• liquid waste is not acceptable at WIPP. Liquid in the quantities delineated below is acceptable
	  • Observable liquid shall be no more than 1 percent by volume of the outermost container at the time of radiography or visual examination
	  • Internal containers with more than 60 milliliters or 3 percent by volume observable liquid, whichever is greater, are prohibited
	  • Containers with Hazardous Waste Number U134 assigned shall have no observable liquid
	  • Overpacking the outermost container that was examined during radiography or visual examination or redistributing untreated liquid within the container shall not be used to meet the liquid volume limits
	• non-radionuclide pyrophoric materials
	• hazardous wastes not occurring as co-contaminants with TRU wastes (non-mixed hazardous wastes)
	• wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes
	• wastes containing explosives or compressed gases (continued below)					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
12a	• wastes with polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization • wastes exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003) • waste that has ever been managed as high-level waste and waste from tanks specified in Table C-8, unless specifically approved through a Class 3 permit modification • any waste container from a waste stream (or waste stream lot) which has not undergone either radiographic or visual examination of a statistically representative subpopulation of the wastes stream in each shipment pursuant to Permit Attachment C7 • any waste container from a waste stream which has not been preceded by an appropriate, certified Waste Stream Profile Form (see Section C-1d) (Section C-1c)					
	Waste Acceptance Control					
14	Are procedures in place to ensure that the generator/storage site uses a Waste Stream Profile Form (WSPF) which includes, at a minimum, the information indicated on the attached WSPF found in Figure C-1 and a Characterization Information Summary (CIS) prior to waste disposal at the WIPP? (Section C-1d)					
16	Are procedures in place to ensure that additional WSPFs are provided to WIPP and NMED for waste streams or portions of waste streams that are reclassified based upon waste characterization information? (Section C-1d)					
16a	Are criteria in place to determine the specific circumstances under which a WSPF is revised versus when a new WSPF is required? (Section C-1d)					
	Laboratory Qualification					
17	Are procedures in place to ensure that the generator/storage site conduct analyses using laboratories that are qualified through participation in the Performance Demonstration Program (PDP) for headspace gas sampling and analysis, and PDP homogeneous waste sampling and analysis? (Section C-3a(3))					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
18	Are procedures in place to ensure that the generator/storage sites conduct analyses using laboratories that implement the analytical methods through laboratory-documented standard operating procedures (SOPs) that ensure that analytical QAOs are met? (Section C-3a(3))					
19	Are procedures in place to ensure that documented laboratory QA/QC programs include the following: • Facility organization • List of equipment/instrumentation • Operating procedures • Laboratory QA/QC procedures • Quality assurance review • Laboratory records management (Section C-4a(4))					
	General Sampling and Analytical Requirements					
20	Are procedures in place to ensure that headspace gas sampling and analysis shall be used to: • Determine the types and concentrations of VOCs in the void volume of waste containers • VOC constituents shall be compared to those assigned by Acceptable Knowledge (Section C-3a(1))					
22	Are procedures in place to ensure that compounds not on the list of target analytes are reported as tentatively identified compounds (TICs) and that the TIC will be added to the target analyte list if it appears in the 20.4.1.200 NMAC (incorporating 40 CFR 261) Appendix VIII list and if they are reported in 25% of the waste containers sampled from a given waste stream? (Section C-3a(1))					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
23	Are procedures in place to ensure that a randomly selected set of samples will be collected through core sampling or other EPA approved sampling from the population of waste containers for homogeneous and soil/gravel waste streams? Are procedures in place that a sufficient number of samples are collected to evaluate the toxicity characteristic of a waste stream at a 90 percent Upper Confidence limit as specified in Attachment C2? (Section C-3a(2))					
24	Are procedures in place to ensure that total analyses or TCLP of VOCs, SVOCs, and RCRA-regulated metals are performed on all core samples to determine if the waste exhibits a toxicity characteristic? (Section C-3a(2))					
25	Are procedures in place to ensure that Acceptable Knowledge is used in waste characterization activities to delineate TRU mixed waste streams, to assess whether TRU mixed wastes comply with the TSDF-WAC, to assess whether TRU mixed waste exhibits a hazardous characteristic (20.4.1.200 NMAC, incorporating 40 CFR 261 Subpart C), and to assess whether TRU wastes are listed (20.4.1.200 NMAC, incorporating 40 CFR 261 Subpart D), and to estimate waste material parameter weights? (Section C-3b)					
26	Are procedures in place to ensure that radiography and/or visual examination are used as necessary to: • Examine a waste container to determine the physical form • Identify observable liquid in excess of TSDF-WAC limits and containerized gases • Verify the physical form matches the waste stream description (Section C-3c)					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
27	Are procedures in place to ensure that the following characterization activities shall occur for newly generated wastes: • Acceptable Knowledge for all wastes, with sampling and analysis as necessary to augment AK including; : - Either visual examination during packaging or radiography (or VE in lieu of radiography) after packaging for all waste containers, ensuring this occurs prior to any treatment designed to supercompact waste - Headspace gas analysis for randomly selected containers , except for qualifying waste containers belonging to LANL sealed sources waste streams - Total VOC, SVOC, and Metals analyses for a selected number of homogeneous solids and soil/gravel waste containers as specified in Attachment C2 - Evaluation of any TICs found in headspace gas and totals analyses (Section C-3d(1))					
27a	Are procedures in place to ensure that the visual examination during packaging for all waste containers includes the documentation of packaging configuration, type and number of filters, and rigid liner vent hole presence and diameter necessary to determine the appropriate DAC in accordance with Permit Attachment C1, Section C1-1? (Section C-3d(1))					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
28	Are procedures in place to ensure that the following characterization activities shall occur for retrievably stored wastes: • Acceptable Knowledge for all wastes, with sampling and analysis as necessary to augment AK including; - Visual examination or radiography for all waste containers - Headspace gas analysis for randomly selected containers except for qualifying waste containers belonging to LANL sealed sources waste streams - Total VOC, SVOC, and Metals analyses for a statistically selected number of homogeneous solids and soil/gravel waste containers as specified in Attachment C2 - Evaluation of any TICs found in headspace gas and totals analyses (Section C-3d(2))					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
	Data Generation, Verification, Validation, Documentation, and Quality Assurance					
30	Are procedures in place to ensure that the following Data Quality Objectives are met: • Use Acceptable Knowledge to delineate TRU mixed waste streams, assess whether TRU mixed wastes comply with the applicable requirements of the TSDF-WAC, assess whether TRU mixed wastes exhibit a hazardous characteristic, assess whether TRU mixed wastes are listed and to estimate waste material parameter weights • Use Headspace gas sampling and analysis, as necessary, to identify and quantify VOCs in waste containers to resolve the assignment of EPA hazardous waste numbers • Perform totals analyses of homogeneous solids and soils/gravel wastes to establish if the waste is hazardous based on the toxicity characteristics levels in 20.4.1.200 NMAC through a comparison of the upper confidence limits (UCL_{90}) of the mean concentrations to resolve the assignment of hazardous waste numbers • Use radiography or visual examination to determine physical waste form, the absence of prohibited items, and additional waste characterization techniques that may be used based on Summary Category Groups (Section C-4a(1))					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
31	Are procedures in place to ensure that the following Quality Assurance Objectives are adequately defined and assessed for each characterization method: • Precision as a measure of the mutual agreement among multiple measurements. • Accuracy as the degree of agreement between a measurement result and a true or known value. • Completeness is a measure of the amount of valid data obtained from a method compared to the total amount of data obtained that is expressed as a percentage. • Comparability is the degree to which one data set can be compared to another data set. • Representativeness as an expression of the degree to which data represent characteristics of a population. (Section C-4a(2))					
32	With respect to data generation, are procedures in place to ensure that the generator/storage site's waste characterization program meets the following general requirements: • Analytical data packages and batch data reports must be reported accurately in a pre-approved format, must be maintained in permanent files, and must be traceable? • All data must receive a technical review by another qualified analyst or the technical supervisor, and the laboratory QA officer? (Section C3-10a)					
33	Are procedures in place to ensure that the generator/storage site performs validation of waste characterization data for each waste container? (Section C-4)					
34	Are procedures in place to ensure that the generator/storage site has a pre-approved format for reporting waste characterization data? (Section C-4a(4))					
35	Are procedures in place to ensure that the generator/storage site prepares analytical, testing, and sampling batch data reports to meet the requirements of their own site-specific QAPjP and/or SOPs? (Section C-4a(4))					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
36	Are procedures in place to ensure that all raw data is collected and managed at the data generation level in accordance with the following criteria: • All raw data shall be signed and dated in reproducible ink by the individual collecting the data, or signed and dated using electronic signatures • All data shall be recorded clearly, legibly, and accurately in field and laboratory records and include applicable sample identification numbers • All changes to original data shall be lined out, initialed, and dated by the individual making the change. Original data may not be obliterated or otherwise be made unreadable • All data shall be transferred and reduced from field and laboratory records completely and accurately • All field and laboratory records shall be maintained as specified in Table C- 6 of Attachment C • Data shall be organized into standard reporting formats for reporting purposes. • All electronic and video data must be stored to ensure that waste container, sample and QC data are readily retrievable (Section C3-10a)					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
37	Are procedures in place to ensure that 100 % of batch data reports are subject to independent technical review by an individual qualified to review the data who was not involved in the generation or recording of the data under review. The reviewer shall release the data through signature with an associated review checklist prior to characterization of the associated waste and shipment to the WIPP. The review shall ensure the following, as applicable: • Data generation and reduction were conducted according to the methods used and reported in the proper units and significant figures • Calculations have been verified by a valid calculation program, a spot check of verified calculation programs, and/or a 100 percent check of all hand calculations • The data have been reviewed for transcription errors • The testing, sampling, and analytical QA documentation for BDRs is complete and includes, as applicable, raw data, DAC and equilibrium calculations and times, calculation records, chain of custody forms, calibration records, QC sample results and copies or originals of gas canister sample tags. • All QC sample results are within established control limits, and if not, the data has been appropriately qualified • Reporting flags were assigned correctly • Sample holding times and preservation requirements were met, or exceptions documented • Radiography tapes are reviewed on a waste container basis at a minimum of once per testing batch or once per day of operation, whichever is less frequent. The radiography tape will be reviewed against the data on the radiography form to ensure that data are complete and correct • Field sampling records are complete • QAOs have been met (Section C3-10a(1))					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
40	Are procedures in place to ensure that 100 percent of all batch data reports receive a Site Project Manager signature release with an associated review checklist prior to characterization of the associated waste and shipment to the WIPP. This release shall ensure the following: • The Site Project Manager or designee shall determine the validity of the drum age criteria (**DAC**) assignment made at the data generation level based upon an assessment of the data collection and evaluation necessary to make the assignment. • Testing batch QC checks were properly performed. Radiography data are complete and acceptable based on evidence of videotape review of one waste container per day or once per testing batch, whichever is less frequent • Sampling batch QC checks were properly performed, and meet the established QAOs and are within established data usability criteria • Analytical batch QC checks were properly performed and meet the established QAOs and are within established data usability criteria • Online batch QC checks were properly performed and meet the established QAOs and are within established data usability criteria • Proper procedures were followed to ensure representative samples of headspace gas and homogeneous solids and soil/gravel were taken • Data generation level independent technical review, validation, and verification have been performed as evidenced by the completed review checklists and appropriate signature releases. • Independent technical reviewers were not involved in the generation or recording of the data under review. • Batch Data review checklists are complete • Batch Data Reports are complete and data properly reported • Verify that data are within established data assessment criteria and meet all applicable QAOs (Section C3-10b(1))					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
42	Are procedures in place to ensure that a repeat of the data review process at the data generation level will be performed on a minimum of one randomly chosen waste container every quarter to determine if the verification and validation is performed according to documented procedures? (Section C3-10b)					
43	Are procedures in place and checklists are available to prepare a Site Project Manager (SPM) Summary and a Data Validation Summary (the summaries may be in the same document)? The SPM Summary includes a validation checklist for each batch that is of sufficient detail to document all aspects of a batch data report that could affect data quality. The Data Validation Summary must identify each Batch Data Report reviewed , describe how the validation was performed, identify all problems, and identify all acceptable and unacceptable data. Summaries must include release signatures. (Section C3-10b(2))					
44	Are procedures in place to ensure that non-administrative, WAP-related nonconformances first identified at the site project manager level are reported to the Permittees within seven calendar days of identification, that nonconformance reports are prepared within 30 calendar days, and that corrective action is implemented prior to waste shipment? (Section C3-13)					
45	Are procedures in place to ensure that any waste container for which a nonconformance report (**NCR**) has been written will not be shipped to the WIPP facility unless the condition that led to the NCR for that container is appropriately identified, reconciled, corrected, and documented? Are nonconformance reports prepared for nonconformances identified? Are nonconformances identified and tracked, and does the Site Project Manager oversee the nonconformance report process? (Section C3-13)					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
	Sample Control					
46	Are procedures in place to ensure that the site's sample handling and control program includes the following: • Field documentation of samples including point of origin, date of sample, container identification, sample type, analysis requested, and chain-of-custody (COC) number? • Proper labeling and/or tagging including proper sample numbering, sample identification, sample date, sampling conditions, and analysis requested? • COC record including name of sample relinquisher, sample receiver, and date and time of sample transfer? and • Proper sample handling and preservation? (Section C-4a(3))					
47	Are procedures in place to ensure that the site's QAPjP or site-specific procedures includes COC forms to control the sample from the point of origin to the final analysis result reporting? (Section C-4a(3))					
	Data Transmittal					
48	Are procedures in place to ensure that the generator/storage site transmits data by hard copy or electronic copy from the data generation level to the site project level? If electronic, does the generator/site have a hard copy available on demand? (Section C-4a(6))					
50	Are procedures in place to ensure that the generator/storage site inputs the data into the WWIS manually or electronically? (Section C-4a(6))					
51	Are procedures in place to ensure that the generator/storage site enters the data into the WWIS in the exact format required by the database? (Section C-4a(6))					
51a	Are procedures in place to ensure that if a container was part of a composite headspace gas sample, the analytical results from the composite sample must be assigned as the container headspace gas data results, including associated TICs, for every waste container associated with the composite sample in the WWIS? (Section C3-12b(4))					
52	Are procedures in place to ensure all of the data presented on Table C- 7 of the Permit is transmitted to the WWIS? (Table C-7)					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
	Records and Record Management					
55	Are procedures in place to ensure that the generator/storage site's hard copy and/or electronic data reports follow the Permittees' format requirements? (Section C-4a(4))					
56	Are procedures in place to ensure that hard copy or electronic Waste Stream Profile Form will include the following • Generator/storage site name • Generator/storage site EPA ID • Date of audit report approval by NMED (if obtained) • Original generator of waste stream • Whether waste is Contact-Handled or Remote-Handled • Waste Stream WIPP Identification Number • Summary Category Group • Waste Matrix Code Group • Waste Material Parameter Weight Estimates per unit of waste • Waste stream name • A description of the waste stream • Applicable EPA hazardous waste numbers • Applicable TRUCON codes • A listing of acceptable knowledge documentation used to identify the waste stream • The waste characterization procedures used and the reference and date of the procedure • Certification signature of Site Project Manager, name, title, and date signed (Section C3-12b(1))					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
56a	Are procedures in place to ensure that hard copy or electronic Characterization Information Summary will include the following: • Data reconciliation with DQOs • Headspace gas summary data listing the identification numbers of samples used in the statistical reduction, the maximum, mean, standard deviation, UCL_{90}, RTL, and associated EPA hazardous waste numbers that must be applied to the waste stream. • Total metal, VOC, and SVOC analytical results for homogeneous solids and soil/gravel (if applicable), • TIC listing and evaluation, • Radiography and visual examination summary to document that all prohibited items are absent in the waste (if applicable) • A complete listing of all container identification numbers used to generate the Waste Stream Profile Form, cross-referenced to each Batch Data Report • Complete AK summary, including stream name and number, point of generation, waste stream volume (current and projected), generation dates, TRUCON codes, Summary Category Group, Waste Matrix Code(s) and Waste Matrix Code Group, other TWBIR information, waste stream description, areas of operation, generating processes, RCRA determinations, radionuclide information, all references used to generate the AK summary, and any other information required by Permit Attachment C4, Section C4-2b. • Method for determining Waste Material Parameter Weights per unit of waste. • List of any AK Sufficiency Determinations requested for the waste stream. • Certification through acceptable knowledge or testing and/or analysis that any waste assigned the hazardous waste number of U134 (hydrofluoric acid) no longer exhibits the characteristic of corrosivity. This is verified by ensuring that no liquid is present in U134 waste. • A justification for the selection of radiography and/or VE as an appropriate method of characterizing the waste. (Section C3-12b(2))					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
56b	Are procedures in place to assure that ongoing container characterization results are cross referenced to Batch Data Reports? Section C3-12b					
58	Are procedures in place to ensure that project level reports are compiled into Characterization Information Summaries (Section C3-12b)					
59	Are procedures in place to ensure that the generator/storage site uses forms for data reporting that are pre-approved forms in site-specific documentation? (Section C3-12)					
60	Are procedures in place to ensure that the generator/storage site's site project manager submits to the WIPP facility a summary of the waste stream information and reconciliation with data quality objectives (DQOs) once a waste stream is characterized? (Section C-4a(6))					
61	Are procedures in place to ensure that the generator/storage site project office completes a WSPF based on the Batch Data Reports? C3-12b)					
62	Are procedures in place to ensure that the generator/storage Site Project Manager submits the WSPF to the Permittees for DOE's approval along with the accompanying Characterization Information Summary for that waste stream? (Section C-4a(6))					
63	Are procedures in place to ensure that the generator/storage site maintains records related to waste characterization sampling and analysis activities in the testing, sampling or analytical facilities files, or site project files for those facilities located on-site? (Section C-4a(7))					
64	Are procedures in place to ensure that the appropriate documented training and indoctrination is performed for all individuals and that procedures are documented in site specific QAPjPs and procedures? (Section C3-14)					
65	Are procedures in place to ensure that the generator/storage site requires contract waste analytical facilities to forward testing, sampling and analytical records along with testing, sampling and analytical batch data reports to the site project office for inclusion in the sites project files? (Section C-4a(7))					
66	Are procedures in place to ensure that the generator/storage site has an appropriate records inventory and disposition schedule (RIDS) or equivalent that was prepared and approved by appropriate site personnel? (Section C-4a(7))					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
67	Are procedures in place to ensure that the generator/storage site maintains all records relevant to an enforcement action, regardless of disposition, until they are no longer needed for enforcement action, and then dispositioned per the approved RIDS? (Section C-4a(7))					
68	Are procedures in place to ensure that the generator/storage site maintains records that are designated as Lifetime Records for the life of the waste characterization program plus six years, or that the records have been transferred for permanent archival storage to the WIPP Records Archive facility? Lifetime Records include: • Field sampling data forms, • Field and laboratory COC forms, • Test facility and laboratory Batch Data Reports, • Waste Stream Characterization Package, • Sampling plans, • Data reduction, validation, and reporting documentation, • Acceptable knowledge documentation, • WSPF and Characterization Information Summary (Section C-4a(7), Table C-6)					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
69	Are procedures in place to ensure that the generator/storage site maintains records that are designated as Non-Permanent Records for ten years from the date of record generation, and then dispositioned according per the approved RIDS or transferred to the WIPP Records Archive facility? Non-Permanent Records include: • Nonconformance documentation, • Variance documentation, • Assessment documentation, • Gas canister tags, • Methods performance documentation, • PDP documentation, • Sampling equipment certifications, • Calculations and related software documentation, • Training/qualification documentation, • QAPjP documentation (all revisions), • Calibration documentation, • Analytical raw data, • Procurement documentation, • QA procedures (all revisions), • Technical implementing procedures (all revisions), and • Audio/video recording (radiography, visual, etc.). (Section C-4a(7), Table C-6)					
70	Are procedures in place to ensure that the generator/storage site has raw data that is identifiable and legible, and provides documentary evidence of quality? (Section C-4a(7))					
71	Are procedures in place to ensure that if the generator/storage site ceases to operate, that all records be transferred before closeout? (Section C-4a(7))					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
	Shipment					
72	Are procedures in place to ensure that the generator/storage site accurately completes an EPA Hazardous Waste Manifest prior to shipping the waste to WIPP that contains the following information: • Generator/storage site name and EPA ID • Generator/storage site contact name and phone number • Quantity of waste • List of up to six state and/or federal hazardous waste numbers in each line item • Listing of all container IDS • Signature of authorized generator representative (Section C-5b)					
73	Are procedures in place to ensure that the generator/storage site accurately completes the following container specific information: • Waste stream identification number • List of hazardous waste numbers per container • Certification data • Shipping data (Section C-5b)					

1. The WAP requirements should be presented in documents, such as procedures. Each of the questions posed under WAP requirements are meant to ask whether procedures are in place or whether documents are evident which demonstrate that the specific WAP requirement is or can be met

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Table C6-2 Solids and Soils/Gravel Sampling Checklist

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Solids and Soils/Gravel Sampling Checklist

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
	General Solids Sampling Requirements					
75	Are procedures documented that adequately ensure that when a Determination Request has not been approved, sampling and analysis of newly generated homogeneous solid and soil/gravel waste streams shall be conducted in accordance with the requirements specified in Attachment C1, Section C1-2. (Section C-3d(1)(a))					
76	Are procedures in place to ensure that the number of newly generated soils/gravel waste containers to be randomly sampled will be determined using the procedure specified in Section C2-1, wherein a statistically selected portion of the waste will be sampled? (Section C-3d(1)(a))					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
77	Are procedures in place to ensure that the following sample collection requirements for retrievably stored and newly generated waste streams are met: • The number of random samples collected for characterization of retrievably homogeneous solid and soil/gravel stored waste is performed by developing preliminary mean and variance estimates for each analyte to define the number of required random samples; and that the sample selection process is adequately documented. • A minimum of 5 waste containers in a retrievably stored waste streams are sampled to establish the preliminary estimate for the number of samples. • Based on the number of samples required by the preliminary estimate, the subsequent sample means and deviations for each analyte are evaluated against the regulatory threshold for each constituent to determine if additional samples shall be collected. • Samples (the number of which is statistically determined) are collected to verify that a TRU mixed waste is below the regulatory threshold, where the regulatory threshold is the toxicity limit for toxicity characteristics and the PRQL for listed waste constituents. • Samples from preliminary estimates counted as required samples were randomly selected and were collected, analyzed, and validated using representative methods (Section C2-1a)					
80	Are procedures in place that allow toxicity characteristic contaminants associated with F-numbers for a waste stream to be omitted from sampling requirements? (Section C2-1a)					
	Solids Sampling Procedures					
81	Do procedures ensure that samples for retrievably stored waste are collected using appropriate coring tools or other EPA approved methods, and that newly generated wastes that are sampled from a process as it is generated are sampled using EPA approved methods, including scoops and ladles, that are capable of collecting a representative sample? (Section C1-2a)					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
82	Do site specific procedures, QAPjPs, and/or SOPs indicate that rotational coring tools are available for the collection of cores and non-rotational coring tools available for collection of cores in relatively soft media. The method used shall be appropriate to retrieve the maximum core amount. The coring tools will include the following features: • Removable tube liners constructed of rigid materials unlikely to affect the composition and/or concentration of target analytes in the sample core (Teflon®) and sufficiently transparent to allow visual examination of the core. The liner outer diameters are between 1-2 inches and the liner wall thickness is no greater than 1/16 inch. The liner shall fit flush with the coring tool inner wall and be of sufficient length to hold a core representative of the waste along the entire depth of the waste. • Sleeves composed of polycarbonate, Teflon, or glass for most samples and brass or stainless steel for non-metal samples • Liner end caps shall fit tightly around the ends of the liner and shall be composed of materials unlikely to affect the composition and/or concentration of analytes in the core (Teflon®) • Spring retainers shall be used when the physical properties of the sampling media may cause the sample to fall out of the liner. The retainer shall be composed of inert materials and the inner diameter shall not be less than the inner diameter of the liner • Coring tools may have an air lock mechanism. The air lock shall also close when the core is removed from the waste container • Core extruders shall be used to extrude the liner if the liner does not slide freely • Coring tools shall be of sufficient length to hold the liner and shall be constructed to allow placement of the liner leading edge as close as possible to the coring tools leading edge					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
82a	• All surfaces of the coring tool that have the potential to contact the sample core or sample media shall be cleaned prior to use • Rotational coring tools shall have a mechanism to minimize inner liner rotation and shall be designed to minimize frictional heat transfer to the sample core • The leading edge of the coring tool may be sharpened and tapered to a diameter equivalent or slightly smaller than the inner diameter of the liner. • Non-Rotational coring tools shall be designed to minimize the kerf width (½ the difference between the outer diameter of the tool and the tools inlet inner diameter) (Section C1-2a(1))					
83	Does the site adequately document that the liner material and retainers are not likely to contain any analytes of concern? (Section C1-2a(1))					
84	Are procedures in place to ensure that equipment blanks are collected and evaluated to verify that liner material, retainers, or other sampling equipment in contact with the sample do not contain analytes of concern? (Section C1-2b(2))					
	Sample Collection					
85	Are procedures in place to ensure that sampling is completed in a timely manner, within 60 minutes of core collection, or that the core shall remain in the capped liner, or the coring tool shall remain in the waste container with the air lock mechanism attached? (Section C1-2a(2))					
86	Are procedures in place to ensure that VOC samples are sampled prior to extruding the core from the liner and that the sample locations are documented? These samples may be collected by choosing a single sample from the representative subsection of the core, or three equal length VOC sample locations on the core are selected randomly along the long axis of the core to form a single 15-gram composite sample. Smaller sample sizes may be used if method PRQL requirements are met for all analytes. (Section C1-2a(2))					
87	Are procedures documented to ensure that a VOC sample is collected using a metal coring cylinder or equivalent equipment as described in SW-846 and that the sample is immediately extruded into a 40 mL VOA vial (or other containers specified in appropriate SW-846 methods)? (Section C1-2a(2))					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
88	Are procedures in place to ensure that SVOC and Metals sample location(s) on the core are selected randomly along the long axis of the core and that the sample locations are documented, or that samples are collected at the same locations as VOC samples? Samples may be collected by splitting or compositing the representative subsection of the core. The representative subsections are chosen by randomly selecting a location along the portion of the core from which the sample was taken. (Section C1-2a(2))					
89	Are procedures in place to ensure that the SVOC and Metals sample s are collected using equipment constructed of materials unlikely to affect the composition or concentrations of the samples? (Section C1-2a(2))					
90	Are procedures in place to ensure that newly generated waste samples collected by means other than coring are collected as soon as possible and that spatial and temporal homogeneity is evaluated to determine if composite or grab samples are appropriate? (Section C1-2a(2))					
91	Are procedures in place to ensure sample volumes, preservatives, containers, and holding times meet the following specifications: **Minimum sample quantity** VOC 15 grams SVOC 50 grams Metals 10 grams (Quantity may be increased or decreased according to the requirements of the analytical laboratory, as long as the QAOs are met.) **Preservative** VOC Cool to 4C SVOC Cool to 4C Metals Cool to 4C **Sample Container** VOC 40 mL VOA glass vial (or other appropriate containers) cap SVOC glass jar with Teflon© lined cap Metals polyethylene or polypropylene bottle **Holding Time from Date of Collection** VOC 14 days prep/40 days analyze SVOC 14 days prep/40 days analyze Metals 180 days/ 28 days Hg (Table C1-4)					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
	Quality Control Sample Collection					
92	Are procedures in place to ensure that sampling precision will be determined through the collection of co-located core field duplicate samples for core samples and through the collection of co-located samples for samples collected using alternate methods at the frequency of once per 20 sample batch collected over 14 days or once per week, whichever is more frequent? (Section C1-2b(1))					
93	Are procedures in place to ensure that co-located cores are collected side by side as close as feasible to each other, that the cores are collected and handled in the same manner? (Section C1-2b(1))					
94	Are procedures in place to ensure that an additional sampling location is found or new co-located cores are collected if the visual examination of the original co-located cores detects inconsistency in the sample color, texture, or waste type? (Section C1-2b(1))					
95	Are procedures in place to ensure that all surfaces of sampling tools that have the potential to come into contact with the sample, including tube liners, endcaps, spring retainers, extruders, coring tool surfaces, or any other sampling equipment, are either thoroughly decontaminated or disposed of after each sampling event? (Sections C1-2b(2), C1-2b(3))					
96	Are procedures in place to ensure that equipment blanks are collected from randomly selected fully assembled coring tools or randomly selected liners (if they are cleaned separately) and from randomly selected sampling equipment (e.g. VOC subsampler, spoons, bowls) at a frequency of once per equipment cleaning batch and that the sample is collected prior to first use? (Section C1-2b(2))					
97	Are procedures in place to ensure that equipment blanks will be collected in the area where sampling equipment coring tools are cleaned, prior to covering the coring tools with protective wrapping and storage? (Section C1-2b(2))					
99	Are procedures in place to ensure that miscellaneous sampling tool equipment blanks will be collected by pouring deionized or HPLC water over the surface of the equipment and into a clean sample container appropriate for the requested analysis? (Section C1-2b(2))					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
100	Are procedures in place to ensure that equipment blanks are analyzed for VOC, SVOC, and Metals and that the entire equipment batch will be re-cleaned and re-sampled if any analytes are detected at levels greater than 3 times the MDL or PRDL (Section C1-2b(2))					
101	Are procedures and processes in place to ensure that equipment blanks are traceable to a specific equipment cleaning batch and that the equipment cleaning batch is traceable to specific identified sampling equipment? Are sampling equipment or coring tools labeled with unique identification numbers that are referenced in field records? (Section C1-2b(3))					
102	Are procedures in place to ensure that disposable sampling equipment is certified as clean prior to use? (Section C1-2b(2))					
	Sample Equipment Testing, Inspection and Maintenance					
103	Are procedures in place to ensure that all sampling and coring tools are tested prior to use in accordance with manufacturers specification to ensure that the air-lock mechanism and rotation mechanism are in working order? (Section C1-2c)					
104	Are procedures in place to ensure that malfunctioning sampling and coring tools are repaired or replaced prior to use? (Section C1-2c)					
105	Are procedures in place to ensure that all equipment is cleaned, sealed inside a protective wrapping and stored in a clean area? (Section C1-2c)					
106	Are procedures in place to ensure that an adequate spare part inventory is available? (Section C1-2c)					
107	Are procedures in place to ensure that all equipment maintenance and repair is documented in field records and that field record logbooks are available to document equipment maintenance and repair activities? (Section C1-2c)					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
108	Are procedures in place to ensure that inspection of equipment and work area cleanliness will encompass the following: • Sample collection equipment in the immediate area of sample collection shall be inspected daily for cleanliness and that any visible contamination that has a potential to contaminate a waste sample shall be thoroughly cleaned upon discovery • The waste coring and sampling work areas shall be maintained in clean condition • Expendable equipment shall be visually inspected for cleanliness prior to use and properly discarded after use • Protective wrapping on coring tools and other sampling equipment are visually inspected prior to unwrapping. Coring tools or other equipment with torn protective wrappers or with visible contamination are returned to be cleaned or properly discarded prior to use. • All sampling equipment shall be visually inspected prior to use to determine if protective wrapping is torn or if equipment is contaminated after unwrapping. Equipment with torn wrapping or signs of contamination will be returned for cleaning or properly discarded. • Clean sampling and coring equipment is segregated from all equipment that has not been decontaminated. (Section C1-2c)					
109	Are procedures documented to ensure that scales used for weighing sub-samples are calibrated as necessary to maintain its operation within manufacturer's specification, that the calibration is documented, that calibration is verified using NIST traceable weights upon each day of use, and that all calibration verification is documented in field records? (Section C1-2d)					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
	Sample Handling and Custody					
111	Do formats for field logs and custody records specify documentation of the following information: • Signature of individual initiating custody control, along with the date and time • Documentation of sample numbers for each sample under custody. Sample numbers will be referenced to a specific sampling event description that will identify the sampler(s) through signature, date and time of sample collection, type/number containers for each sample, sample matrix, preservatives (if applicable), requested methods of analysis, place/address of sample collection and the waste container number • For off-site shipping, method of shipping transfer, responsible shipping organization or corporation, and associated air bill or lading number.					
111a	• Signatures of custodians relinquishing and receiving custody of samples including date and time of transfer. • Description of final sample container disposition, along with signature of individual removing sample container from custody • Comments section • Documentation of discrepancies, breakage or tampering (Section C1-5)					
112	Are procedures in place to ensure that samples and sampling equipment are identified with unique identification numbers? (Section C1-5)					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
113	Do sample tags or labels contain the following information: • Sample ID number • Sampler initials and organization • Ambient temperature and pressure (for gas samples only) • Sample description • Requested analysis • Date and time of collection • QC designation (if applicable) (Section C1-5)					
114	Are procedures in place to ensure waste containers and samples are sealed with intact custody seals and that one or more of the following custody conditions are met: • It is in the possession of an authorized individual • It is in the view of an authorized individual, after being in the possession of that individual • It was in the possession of an authorized individual and access to the sample was controlled by locking or placement of signed custody seals that prevent undetected access • It is in a designated secure area, such as a controlled access location with complete documentation of personnel access or a radiological containment area (hot cell or glove box) (Section C1-5)					
117	Are procedures in place to ensure that sample custody is maintained until the sample is released by the SPM or is expended. (Section C1-5)					
118	Are procedures in place to ensure that samples in glass jars are wrapped in plastic to prevent breakage and placed in appropriate containers, such as coolers, for shipment? (Section C1-6)					
119	Are procedures in place to ensure that adequate cold packs are included in the sample shipping container to ensure that all temperature requirements are met? (Section C1-6)					

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		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
120	Are procedures in place to ensure that sample COC forms are secured for shipment to the inside of the sealed and locked shipping container and that samples and shipping containers are affixed with tamper proof seals? (Section C1-6)					
121	Are procedures in place to ensure that appropriate blank samples are included with each shipment container containing VOC samples? (Section C1-6)					
122	Are procedures in place to ensure that a custody seal or device is securely affixed across the lid and body of each sample and shipment container, and is traceable to the individual who affixed the seal or device? (Section C1-5)					
	Laboratory Operations					
123	Are procedures in place to ensure that only laboratories that are qualified through participation in the Performance Demonstration Program are eligible to analyze waste samples? (Section C-3a(3))					
124	Are procedures available from all participating laboratories that adequately document that custody is maintained until the sample is released by the site project manager or until the sample is expended? (Section C1-5)					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
	Volatile and Semi-Volatile Analysis of Core Samples					
125	Are procedures documented to ensure that all VOC and SVOC analyses are evaluated using the following criteria: • GC/MS Tunes, Initial Calibrations and Continuing Calibration will be performed and evaluated using criteria in Table C3-5 (VOCs) or Table C3-7 (SVOCs) and SW-846 methods • Precision shall be assessed through analyzing laboratory duplicates or matrix spike duplicates, LCS replicates, and PDP blind-audit samples in comparison to Table C3-4 (VOCs) and Table C3-6 (SVOCs) • Accuracy as %R shall be assessed through evaluation of LCS , Matrix spikes, PDP blind-audit samples, and surrogate compounds in comparison to criteria in Table C3-4 and Table C3-5 (VOCs) and Table C3-6 and Table C3-7(SVOCs) or the SW-846 method. • Laboratory completeness shall be expressed as the number of samples analyzed with valid results as a percent of the total number of samples collected. • Comparability is assessed through use of standardized SW-846 methods sample preparation and methods that meet the QAO requirements in Tables C3-4 and C3-5 (VOCs) and Tables C3-6 and C3-7(SVOCs), traceable standards, and by requiring participation in the PDP. • Representativeness is assured through the use of unbiased sample collection • Results and method detection limits are expressed in Mg/Kg • All method detection limits and program required quantitation limits shall be less than or equal to the limits listed in Table C3-4 or Table C3-6 and the detection limit study procedures shall be documented in SOPs (Section C3-6 and C3-7)					
126	Are procedures documented to ensure that Tentatively Identified Compounds shall be added to the target analyte list if detected in a given waste stream if they are reported in 25% of the waste containers sampled from a given waste stream, and if they appear in the 20.4.1.200 NMAC (incorporating 40 CFR §261) Appendix VIII list? (Section C-3a(1))					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
126a	Are procedures documented to ensure that the following criteria are met with regard to the recognition and reporting of TICS for GC/MS Methods for homogeneous solids and soils and gravels in accordance with SW-846 criteria: • Relative intensities of major ions in the reference spectrum (ions greater than 10% of the most abundant ion) should be present in the sample spectrum. • The relative intensities of the major ions should agree within ± 20 percent. • Molecular ions present in the reference spectrum should be present in the sample spectrum. • Ions present in the sample spectrum but not in the reference spectrum should be reviewed for possible background contamination or presence of coeluting compounds. • Ions present in the reference spectrum but not in the sample spectrum should be reviewed for possible subtraction from the sample spectrum because of background contamination or coeluting peaks. • The reference spectra used for identifying TICs shall include, at minimum, all of the available spectra for compounds that appear in the 20.4.1.200 NMAC (incorporating 40 CFR Part 261) Appendix VIII list. The reference spectra may be limited to VOCs when analyzing headspace gas samples. • TICs for headspace gas analyses that are performed through FTIR analyses shall be identified in accordance with the specifications of SW-846 Method 8410. (Section C3-1)					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
126b	TICs shall be reported as part of the analytical batch data reports for GC/MS Methods in accordance with the following minimum criteria: • a TIC in an individual container headspace gas or solids sample shall be reported in the analytical batch data report if the TIC meets the SW-846 identification criteria listed above and is present with a minimum of 10% of the area of the nearest internal standard. • a TIC in a composited headspace gas sample that contains 2 to 5 individual container samples shall be reported in the analytical batch data report if the TIC meets the SW-846 identification criteria listed above and is present with a minimum of 2% of the area of the nearest internal standard. • a TIC in a composited headspace gas sample that contains 6 to 10 individual container samples shall be reported in the analytical batch data report if the TIC meets the SW-846 identification criteria listed above and is present with a minimum of 1% of the area of the nearest internal standard. • a TIC in a composited headspace gas sample that contains 11 to 20 individual container samples shall be reported in the analytical batch data report if the TIC meets the SW-846 identification criteria listed above and is present with a minimum of 0.5% of the area of the nearest internal standard. (Section C3-1)					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
	Metals Analysis of Core Samples					
127	Are procedures in place to ensure that all Metals analyses are evaluated using the following criteria: • Precision shall be assessed by analyzing of laboratory sample duplicates or laboratory matrix spike duplicates, LCS replicates, and PDP blind audit samples in comparison to Table C3-8 • Accuracy shall be assessed through analysis of laboratory matrix spikes, PDP blind-audit samples, serial dilutions, interference check samples, and laboratory control samples in comparison to criteria in Tables C3-8 and C3-9 • Instrument detection limits are expressed in ug/L and results are listed in Mg/Kg. • All instrument detection limits and program required detection limits shall be less than the limits listed in Table C3-8 and the detection limit study procedures shall be documented in laboratory SOPs. The Instrument detection limits shall be less than the associated PRDL for each analyte *(This requirement is not mandatory if the sample concentrations are greater than 5 times the instrument detection limit (IDL) for a method)* • Instrument detection limits shall be determined semiannually using procedures documented in laboratory SOPs					
127a	• Laboratory completeness shall be expressed as the number of samples analyzed with valid results as a percent of the total number of samples submitted for analysis. • Comparability is assessed through use of standardized SW-846 sample preparation and methods that meet the QAO requirements in Tables C3-8 and C3-9, demonstrating successful participation in the PDP and use of traceable standards. • Representativeness is assured through the use of unbiased sample collection and preparation of samples using unbiased methods. • Results PRQLs are expressed in Mg/Kg wet weight (Section C3-8)					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
	Quality Assurance Objectives					
128	Are procedures in place to ensure that the sample completeness rate is expressed as the number of valid samples collected as a percentage of the total samples collected for each waste stream? The rate must be greater than 90 percent for all compounds in a waste stream. (Section C3-3)					
129	Are procedures in place to ensure that sampling operations are comparable through the use of standardized procedures, sampling equipment, and measurement units participation in the PDP? (Section C3-3)					
130	Are procedures in place to ensure that sampling precision shall be determined through the collection of field duplicates at a rate of 1 per sampling batch (up to 20 samples) or 1 per week, whichever is more frequent? (Section C3-3)					
131	Are procedures in place to ensure that the variance measured between co-located core samples is compared to the variance within the waste stream using the F-test? (Section C3-3)					
132	Are procedures in place to ensure that sampling accuracy as a result of equipment blank evaluation is determined through the collection of equipment blanks at a frequency of once per equipment cleaning batch (Section C3-3)					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
133	Are procedures in place to ensure that the representativeness of samples is demonstrated through the following requirements: • Use of coring tools and sampling equipment that are clean prior to use • The entire depth of the waste minus a documented safety factor shall be cored and the core collected shall have a core length greater than or equal to 50 percent • The core recovery is calculated as the length of the core collected over the depth of the waste in the container • Coring operations and tools should be designed to minimize alteration of the in-place waste characteristics and the minimum waste disturbance shall be verified by visually examining the core and documenting the observation in field logbooks (Note: if core recovery is less than 50 percent, a second core shall be randomly selected. The core with the best recovery shall be used for sample collection) (Section C3-3)					

1. The WAP requirements should be presented in documents, such as procedures. Each of the questions posed under WAP requirements are meant to determine whether procedures are in place or whether documents are evident which demonstrate that the specific WAP requirement is or can be met.

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Table C6-3 Acceptable Knowledge (AK) Checklist

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1

Acceptable Knowledge (AK) Checklist[1]

	WAP Requirement[2]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
	General Requirements					
134	Are the primary document(s) required in Permit Attachment C4 containing acceptable knowledge information available? (Section C4-2)					
135	Has the generator developed a methodology whereby a logical sequence of acceptable knowledge information that progresses from general facility to more detailed waste-specific information can be acquired? (Section C4-2)					
136	Does the site have adequate procedures in place to ensure that the Acceptable Knowledge process is adequately implemented? Do these procedures facilitate the mandatory traceability analysis performed for each Summary Waste Category Group examined during the audit? (Section C4-2)					
137	Does the generator site's TRU mixed waste management program information clearly define (or provide a methodology for defining) waste categorization schemes and terminology, provide a breakdown of the types and quantities of TRU mixed waste generated/stored at the site, and describe how waste is tracked and managed at the generator site (including historical and current operations? Do procedures ensure that waste streams are adequately identified? (Section C4-2a)					
138	Does site documentation procedures indicate that the site will document, justify, and consistently define waste streams and assign EPA hazardous waste numbers? (Section C4-2b)					

	WAP Requirement[2]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
	Required and Additional Information					
140	Does the generator site document that the following must be included in the acceptable knowledge record: • Map of the site with the areas and facilities involved in TRU waste generation, treatment, and storage identified • Facility mission description as related to TRU waste generation and management (e.g., nuclear weapons research may involve metallurgy, radiochemistry, and nuclear physics operations that result in specific waste streams) • Description of the operations that generate TRU waste at the site (e.g., plutonium recovery, weapons design, 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 (Section C4-2a)					

	WAP Requirement[2]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
141	Does the generator site document that the following shall be collected for each waste stream: A. Area(s) and/or building(s) from which the waste stream was or is generated B. 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) C. Waste generating process described for each building (e.g., batch waste stream generated during decommissioning operations of glove boxes), including processes associated with U134 waste generation, if applicable. D. Documentation demonstrating how the site has historically managed the waste, including the historical regulatory status of the waste (i.e., TRU mixed versus TRU non-mixed waste) E. Process flow diagrams (e.g., a diagram illustrating glove boxes from a specific building to a size reduction facility to a container storage area). In the case of research/development, analytical laboratory waste, or the similar processes where process flow diagrams cannot be created, a description of the waste generating processes, rather than a formal process flow diagram, may be included if this modification is justified and the justification is placed in the auditable record F. Material inputs or other information that identifies the chemical content of the waste stream and the physical waste form (e.g., glove box materials and chemical handled during glove box operations, events or processes that may have modified the chemical or physical properties of the waste stream after generation, data obtained through visual examination of newly generated waste that later undergoes radiography; information demonstrating neutralization of U134 [hydrofluoric acid] and waste compatibility) (Section C4-2b)					

	WAP Requirement[2]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
142	Do site documents/procedures require that the facility will provide a summary to the Permittees that summarizes all information collected, including basis and rationale for all waste stream designations? Is an example of this summary available for audit review? If discrepant hazardous waste data exist in required information, do sites consider applying all hazardous waste numbers, but assess and evaluate the information to determine the appropriate hazardous waste numbers consistent with RCRA requirements? (Section C4-2b)					
143	Do site procedures indicate that if the required AK information is not available for a particular waste stream, that the waste stream will not be eligible for an AK Sufficiency Determination? (Section C4-2)					

	WAP Requirement[2]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
144	Have the following procedures been prepared? A. Procedures for identifying and assigning the physical waste form of the waste B. Procedures for delineating waste streams and assigning Waste Matrix Codes C. Procedures for resolving inconsistencies in acceptable knowledge documentation D. Procedures for headspace gas sampling and analysis, visual examination and/or radiography, and homogeneous waste sampling and analysis, if applicable E. For newly generated waste, procedures describing process controls used to ensure prohibited items (specified in the WAP, Permit Attachment C) are documented and managed F. Procedures to ensure radiography and visual examination include a list of prohibited items that the operator shall verify are not present in each container (e.g. liquid exceeding TSDF-WAC limits, corrosives, ignitables, reactives, and incompatible wastes) G. Procedures to document how changes to Waste Matrix Codes, waste stream assignment, and associated Environmental Protection Agency hazardous waste numbers based on material composition are documented for any waste H. Procedures that ensure the assignment of EPA hazardous waste numbers is appropriate, consistent with RCRA requirements, and adequately considers site historical waste management I. Procedures for estimating waste material parameter weights (Section C4-2b)					
145	Does the generator provide procedures or written commitment to collect additional acceptable knowledge information, as available and as necessary to augment mandatory information? (Section C4-2c)					

	WAP Requirement[2]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
145a	For waste containers that belong to LANL sealed sources waste streams, and for which headspace gas sampling and analysis is not required, are there procedures in place to assure the collection of the following additional AK? A. Documentation that the waste container contents meet the definition of sealed sources per 10 CFR §30.4 and 10 CFR §835.2 (effective January 1, 2004) B. Documentation of the certification of the sealed sources as U.S. Department of Transportation Special Form Class 7 (Radioactive) Material per 49 CFR §173.403 (effective October 1, 2003) C. Documentation of contamination survey results that validate the integrity of each sealed source per 10 CFR §34.27 (effective January 1, 2004). D. AK documentation does not indicate the use of VOCs or VOC-bearing materials as constituents of the sealed sources. E. The outer casing of each sealed source must be of a non-VOC bearing material, which must be verified at the time of packaging. F. AK documentation that includes but is not limited to, as available and as necessary to determine the hazardous constituents associated with sealed sources, the following: source manufacturer's sales catalogues, original purchase records, source manufacturer's fabrication documents, source manufacturer's drawings, source manufacturer's fuel capture assembly reports, source manufacturer's operational procedures for cleanliness requirements, source manufacturer's shipping documents, source manufacturer's welding records, transuranic batch material records, and information from national databases (e.g., NMMSS). All of this information may not and need not be available for each source, but sufficient information must be included in the auditable record to derive an adequate understanding of source construction and history to ensure that no VOCs are present in association with the sealed source itself that would render the source hazardous. If AK data indicate that assignment of a hazardous waste number related to organic materials is required in association with a source, this specific source will be assigned to a separate waste stream and that waste stream will be subject to headspace gas sampling unless a separate AK Sufficiency Determination is approved for the waste stream. (Section C4-2c)					

	WAP Requirement[2]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
146	Does the generator site document that all additional specific, relevant information used in the acceptable knowledge process will be identified and its use explained? Is all necessary additional information assembled and has it been appropriately used? (Section C4-2c)					
147	Does the generator site discrepancy analysis documentation (for acceptable knowledge additional and required documentation) indicate that if discrepancies are detected, the site may consider applying all hazardous waste numbers indicated in the required and additional information, but must assess and evaluate the information to determine the appropriate hazardous waste numbers consistent with RCRA requirements? (Section C4-2c)					
	Training					
148	Does the generator site have procedures to ensure that all personnel involved with acceptable knowledge waste characterization have the following training, and is this training documented? A. WIPP WAP in Permit Attachment C and the TSDF-WAC specified in this permit B. State and Federal RCRA regulations associated with solid and hazardous waste characterization C. Discrepancy resolution and reporting D. Site-specific procedures associated with waste characterization using acceptable knowledge (Section C4-3a)					

	WAP Requirement[2]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
	Procedures					
149	Has the generator site developed the following procedures, and are these procedures technically sufficient? A. Sites must 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). B. Sites must develop and implement a written procedure to compile the required acceptable knowledge record. C. Sites must develop and implement a written procedure that ensures unacceptable wastes (e.g., reactive, ignitable, corrosive) are identified and segregated from TRU mixed waste populations sent to WIPP. D. Sites must prepare and implement a written procedure to evaluate acceptable knowledge and resolve discrepancies. For Example if different sources of information indicate different hazardous wastes are present, then sites must include all sources of information in its records and may choose to either conservatively assign hazardous waste numbers or assign only those numbers deemed appropriate and consistent with RCRA requirements. All information used to justify assignment of hazardous waste numbers must be placed in the auditable record. Further, the assignment of hazardous waste numbers shall be tracked in the auditable record to all required documentation.					

	WAP Requirement[2]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
149a	E. Sites must prepare and implement a written procedure to identify hazardous wastes and assign the appropriate hazardous waste numbers to each waste stream. The following are minimum baseline requirements/standards that site-specific procedures must include to ensure comparable and consistent characterization of hazardous waste: 1. Compile all of the required information in an auditable record. 2. Review the compiled information and delineate waste streams. Delineation of waste streams must comply with the definition in Permit Attachment C, Section C-0a, and justify combining waste historically managed separately as TRU mixed and TRU non-mixed waste streams into a single waste stream. 3. Review the compiled information to determine if the waste stream is compliant with the TSDF-WAC 4. Review the required information to determine if the waste is listed under 20.4.1.200 NMAC (incorporating 40 CFR § 261), Subpart D. Assign all listed hazardous waste numbers, unless the site chooses to justify an alternative assignment and document the justification in the auditable record. 5. Review the required information to determine if the waste exhibits a hazardous characteristic or may contain hazardous constituents included in the toxicity characteristics specified in 20.4.1.200 NMAC (incorporating 40 CFR § 261, Subpart C. If a toxicity characteristic contaminant is identified and is not included as a listed waste, sites may evaluate available data and assign the toxicity characteristic hazardous waste number consistent with RCRA requirements. All data examined to reach the hazardous waste number determination must be placed in the auditable record and must present a clear justification for the hazardous waste number analyses. 6. Review the compiled information to provide an estimate of the material parameter weights for each container to be stored or disposed of at WIPP. For newly generated waste, procedures shall be developed and implemented to characterize hazardous waste using acceptable knowledge prior to packaging.					

	WAP Requirement[2]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
149b	F. Sites shall ensure that results of audits of the TRU mixed waste characterization programs at the site are available in the records. G. Sites shall identify all process controls (implemented to ensure that the waste contains no prohibited items and to control hazardous waste content and/or physical form) that have been applied to retrievably stored waste and/or may presently be applied to newly generated waste. Process controls are applied at the time of waste generation/packaging to control waste content, whereas any activities performed after waste generation/packaging to identify prohibited items, hazardous waste content, or physical form are waste characterization activities, not process controls. The AK record must contain specific process control and supporting documentation identifying when these process controls are used to control waste content. See Permit Attachment C, Section C-2 for programmatic requirements related to process controls. (Section C4-3b)					
150	Does the site have implemented procedures which comply with the following criteria to establish acceptable knowledge records: A. Acceptable knowledge information shall be compiled in an auditable record, including a road map for all applicable information. B. 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. C. 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. D. A reference list shall be provided that identifies documents, databases, Quality Assurance protocols, and other sources of information that support the acceptable knowledge information. E. Container inventories for TRU mixed waste in retrievable storage shall be delineated into waste streams by correlating the container identification to all of the required and additional AK information (Section C4-3c)					

	WAP Requirement[2]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
151	If the generator site submitted an AK Sufficiency Determination Request for a specific waste stream, did the site provide all of the requisite information including the identification of the applicable scenario for which approval is sought? (Section C-0b)					
	Re-evaluating Acceptable Knowledge					
152	Does the generator site have written procedures for the augmentation of all acceptable knowledge information using sampling and analysis. Sampling and analysis consists of radiography, visual examination, headspace gas, and homogeneous waste sampling and analysis. Do site procedures indicate that the following sampling and analysis will be conducted based upon the results of the Determination Request Any scenario denied - 100% RTR or VE and statistical HSG or solids S&A Scenario 1 Granted -No sampling and analysis radiography/visual examination is required Scenario 2 Granted-Radiography/visual examination is not required but statistical HSG or solids S&A is required Scenario 3 Granted-100% RTR or VE is required, sampling and analysis is not required (Section C4-1, C-0b)					
155	Does the generator site have procedures for reevaluating acceptable knowledge if the results of the waste confirmation indicate that the waste to be shipped does not match the approved waste stream or if the data from radiography or visual examination for waste streams without an AK Sufficiency Determination exhibit this discrepancy? Does this procedure describe how the waste is reassigned, acceptable knowledge reevaluation, and appropriate hazardous waste numbers are assigned? (Section C4-3e)					
156	Do site procedures indicate that debris wastes are assigned toxicity characteristic EPA numbers based on AK regardless of the quantity or concentration? (C4-3e)					

	WAP Requirement[2]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
	Criteria for Assembling an Acceptable Knowledge Record Delineating the Waste Stream					
158	If wastes are reassigned to a different waste matrix code based on site visual examination or radiography or Permittee confirmation activities, does the generator site have written documentation to ensure that the following steps are followed: F. Review existing information based on the container identification number and document all differences in hazardous waste number assignments G. If differences exist in the hazardous waste numbers that were assigned, reassess and document all required acceptable knowledge information (Section C3-b) associated with the new designation H. Reassess and document all sampling and analytical data associated with the waste I. 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 J. Record all changes to acceptable knowledge records K. If discrepancies exist in the acceptable knowledge information for the revised waste matrix code, document the segregation of the affected portion of the waste stream, and define the actions necessary to fully characterize the waste (Section C4-3e)					

	WAP Requirement[2]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
161	Do site procedures ensure that headspace gas and solid/soil analytical data are used to resolve AK assignments for hazardous waste, as necessary? If a constituent is detected in headspace gas that the site believes isn't from the waste process, the site must provide documentation to support any determination that organic constituents are associated with packaging materials, radiolysis, or other uses not consistent with solvent use. If the source of the detected headspace gas solvents cannot be identified, the appropriate F listing will be assigned. If a constituent in a listed waste is present in solid/soil analytical results, the appropriate listed waste shall be added to the waste stream. F-listed waste assigned by acceptable knowledge shall not be removed based on headspace gas or solids analysis. In the case of totals/TCLP analysis, do procedures reflect the allowance for concentration assessments, wherein sites may add or remove total/TCLP and non-toxic F003 constituents found in headspace and solid/soil analyses? (Section C4-3e)					
162	If sampling and analysis conducted to augment AK determines that a hazardous constituent as identified in headspace gas sampling or soil/homogeneous waste sampling is present in the waste, does the generator site indicate that they will: 1) assign the hazardous waste number to the entire waste stream as applicable, or 2) segregate drums containing detectable concentrations of solvent into a separate waste stream, and assign applicable hazardous waste numbers? (Section C4-3e)					
163	Does the generator site document, justify, and consistently delineate waste streams and assign hazardous waste numbers based on site specific permit requirements or state-enforced agreements? (Section C4-3e)					
164	Does the generator site have written methodologies for determining the mean concentration of solvent VOCs detected by either headspace gas analysis or homogeneous waste sampling for each waste stream or waste stream lot, and are all data ("U" flags designated as one half the MDL and "J" flags, which are less than the PRQL but greater than the MDL)? (Section C4-3e)					
165	Do procedures ensure that spent solvent assignments are made by using the UCL_{90} (of mean concentration), and comparing this with the PRQLs? If the UCL_{90} exceeds the PRQL, is acceptable knowledge reevaluated and determine potential source of the constituent? (Section C4-3e)					

	WAP Requirement[2]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
167	Does the site have written procedures for situations where concentrations of some VOCs are orders of magnitude higher than other target analytes? In these cases, elevated MDLs may be generated, and those constituents with an elevated MDL but "U" designation will not be used in mean calculations. (Section C4-3e)					
	Data Quality Requirements					
168	Are acceptable knowledge processes consistently applied among all generator sites, and does each generator site comply with the following data quality requirements for acceptable knowledge documentation: A. 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. However, the acceptable knowledge information will be addressed by the independent review of acceptable knowledge information during internal and external audits. B. 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 numbers based on sampling and analysis data and discrepancies identified by the Permittees during waste confirmation will be reported as a measure of acceptable knowledge accuracy. C. 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 must contain 100 percent of the information (Permit Attachment C4-3). The usability of the acceptable knowledge information will be assessed for completeness during audits.					

	WAP Requirement[2]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
168a	D. 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 must assign hazardous waste numbers in accordance with Permit Attachment C4-4 and provide this information regarding its waste to other sites who store or generate a similar waste stream. E. 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 Permit Attachment C4. Sites also must assess and document the limitations of the acceptable knowledge information used to assign hazardous waste numbers (e.g., purpose and scope of information, date of publication, type and extent to which waste parameters are addressed). (Section C3-9)					
169	Does the generator site 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 waste discrepancies identified by the generator/storage site during waste characterization or the Permittees during waste confirmation using radiography, review of radiography audio/video recordings, visual examination, or review of visual examination records. In addition, the acceptable knowledge process and waste stream documentation must be evaluated through internal assessments by generator/storage site quality assurance organizations. (Section C4-3e)					

1. NMED expects a traceability analysis to be performed, the results of which should be presented on this checklist under the “Examples of Implementation” column. Further, the traceability analysis process and results should be discussed in the Final Audit Report.

2. The WAP requirements should be presented in documents, such as procedures. Each of the questions posed under WAP requirements are meant to determine whether procedures are in place or whether documents are evident which demonstrate that the specific WAP requirement is or can be met.

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Table C6-4 Headspace Gas Checklist

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Headspace Gas Checklist

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
	Headspace Gas Sampling Frequency					
182	Are procedures in place to ensure that randomly selected retrievably stored and newly generated waste containers will undergo headspace gas sampling and analysis as required to augment AK? (Section C-3a)					
183	Are procedures in place to ensure that randomly selected containers will be allowed to equilibrate to sampling room temperature for 72 hours prior to sampling (18º C or higher) and that the drum ages specified in accordance with Section C1-1a(1) are met? All information necessary to determine drum age criteria must be determined, including but not limited to: • Scenario Determination • Packaging Configuration • Filter Diffusivity • Liner/Lid Opening Diameter ? (Section C1-1a)					
	Headspace Gas Sampling General Requirements					
184	Are procedures in place to ensure all containers of waste are vented through filters to ensure that gases are adequately vented preventing over pressurization or development of conditions that would lead to the development of ignitable, corrosive, reactive, or other characteristic waste? (Section C-1c)					
186	Are procedures in place to ensure that the following gas sample container and holding time requirements are met: • The minimum sample volume for VOC. sample collection is 250 mL. (Note: a single 100 mL sample may be collected if the headspace is limited) • Holding temperatures shall be between 0º C and 40º C (Table C1-1)					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
187	Are procedures in place to ensure that all sampling is performed in an appropriate radiation containment area? (Section C1-1a)					
188	Are procedures in place to ensure that headspace gas is analyzed for the analytes listed in Table C3-2 of the Attachment C3? (Section C1-1a(1))					
189	Are procedures in place to ensure that all headspace gas analyses utilize either SUMMA® or equivalent canisters or on-line integrated sampling/analysis systems? (Section C1-1a(1))					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
	Manifold Sampling					
190	Are procedures, processes, and equipment in place to ensure that the following sampling procedures are implemented: • The sampling equipment is leak checked and cleaned upon first use and as needed • The manifold and sample canisters are evacuated to 0.1 mm Hg prior to sample collection • Cleaned and evacuated sample canisters are attached to the evacuated manifold before the manifold inlet valve is opened • The manifold inlet valve is attached to a changeable filter connected to either a side port needle sampling head capable of forming an airtight seal (for penetrating a filter or rigid poly liner when necessary), a drum punch sampling head capable of forming an airtight seal (capable of punching through the metal lid of a drum while maintaining and airtight seal for sampling through the drum lid), or a sampling head with an airtight fitting for sampling through a pipe overpack container filter vent hole. Refer to Section C1-1a(4) for descriptions of these sampling heads. • Field blanks are collected using samples of room air collected in the sampling area in the immediate vicinity of the waste container. *(Note: field blanks for SUMMA® canisters are collected directly into the canister without the use of the manifold.)* • Manifold equipped with purge assembly that allows QC samples to be collected through all sampling components that affect compliance with QAOs • The manifold internal volume is calculated and documented in a field logbook • The total volume of headspace gas collected is calculated by adding the canister volume and internal manifold volume and should be less than 10 percent of the available headspace volume when a volume estimate is available (Section C1-1a(2))					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
191	Are procedures, processes, and equipment in place to ensure that the following manifold sample side conditions are met: • The sampling head forms a leak-tight connection with the sampling manifold • A flexible hose allowing movement from the purge assembly to the waste container • Pressure sensors that are pneumatically connected to the manifold and must be able to measure absolute pressure from 0.05 mm Hg to 1000 mm Hg with a resolution that must be 0.01 mm Hg at 0.05 mm of Hg. The pressure sensors shall have an operating range of 15°C to 40°C. • Sufficient canister ports shall be available to allow simultaneous collection of headspace gas samples and duplicates for VOC analysis. • Ports not occupied with sample canisters require a plug to prevent ambient air from entering the system • Ports shall have VCR® fittings for connection to the sample canisters to prevent degradation of the fitting on the canister and manifold. • Sample canisters are leak-free, stainless steel pressure vessels, with a Cr-NiO SUMMA®-passivated interior surface or canisters with equivalently inert surfaces, bellows valve, and a pressure/vacuum gauge. All canisters shall have VCR® fittings to sampling and analytical equipment • The pressure/vacuum gauge must be mounted on each manifold and shall be helium-leak tested to 1.5×10^{-7} cc/s, have all stainless steel construction, and be capable of operating at temperatures to 125°C					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
191a	• A dry vacuum pump capable of reducing the manifold pressure to 0.05 mm Hg. (Note: If an oil vacuum pump is used precautions such as a molecular sieve or cryogenic trap shall be used to prevent diffusion of oil vapors back into the manifold) • A minimum distance between the needle and the valve that isolates the pump from the manifold in order to minimize the dead volume in the manifold. • If real time equipment blanks are not available, the manifold shall be equipped with an OVA capable of detecting all analytes listed in Table C3-2 and is capable of measuring total VOC concentrations below the lowest headspace gas PRQL (Section C1-1a(2))					
192	Are procedures, processes, and equipment in place to ensure that the following manifold standard side conditions are met: • A cylinder of compressed zero air, helium, argon, or nitrogen that is hydrocarbon and CO_2 free air (only hydrocarbon and CO_2-free gases required for FTIRS) and certified by the manufacturer to contain less than one ppm VOCs. The gas is used to clean the manifold between samples and to provide gas for the collection of equipment and on-line blanks *(Note: a zero air or nitrogen generator may be used, provided a sample of air is collected and found to contain less than 1 ppm total VOCs and the air is humidified)* • Cylinders of reference gas with known concentrations of analytes from Table C3-2 certified by the manufacturer to provide gases for evaluating the accuracy of the headspace gas sampling process • All cylinders of reference gases and zero air shall be connected to flow regulating devices • A humidifier filled with ASTM Type I or II water, connected, and opened to the standard side of the manifold between the compressed gas cylinders and the purge assembly shall be used, if the Fourier Transform Infrared System (FTIRS) is not used. No humidifier if the FTIRS is used *(Note: Compressed gas may include water vapor between 1000 and 10000 ppmv in lieu of a humidifier)* • The humidifier is off-line during system evacuation to prevent manifold flooding					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
192a	• A purge assembly that allows the sampling head to be connected to the standard side of the manifold. • A flow indicating device or pressure regulator that is connected downstream of the purge assembly to monitor the flow rate or pressure of gases through the purge assembly to ensure that excess flow is available to prevent ambient air from contaminating the QC samples and allow sample of gas from the compress gas cylinders to be collected near ambient pressure. (Section C1-1a(2))					
193	Do procedures ensure that NIST Certified (or equivalent) ambient pressure sensors maintained in the sampling area must have a sufficient measurement range for the expected ambient barometric pressures and a resolution shall be 1.0 mm Hg or less? (Section C1-1a(2))					
194	Do procedures ensure that the NIST traceable (or equivalent) temperature sensor in the sampling location shall have a sufficient measurement range for the ambient temperatures 18 to 50°C? (Section C1-1a(2))					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
	Direct Canister Sampling					
195	Are procedures, processes, and equipment in place to ensure that the following operating conditions are in place for direct canister sampling: • Canisters are evacuated to 0.1 mm Hg prior to use and attached to a changeable filter connected to the sampling head • Sampling heads are capable of either punching through the metal lid of the drums while maintaining an airtight seal for sampling through the drum lid, penetrating a filter or the septum in the orifice of a self-tapping screw, or maintaining an airtight seal for sampling through a pipe overpack container filter vent hole. • Field duplicates are collected in the same manner and at the same time and using the same type of sampling apparatus as used for headspace gas sample collection. • Field blanks shall be samples of room air collected in the immediate vicinity of the waste drum sampling area prior to removal of the drum lid. • Equipment blanks and field reference standards shall be collected using a purge assembly equivalent to the standard side of the manifold • Less than 10 percent of the headspace is withdrawn when a headspace estimate is available (Note: The total volume withdrawn can be determined by adding the canister volume and the internal volume of the sampling head) • Each sample canister shall be equipped with a pressure/vacuum gauge capable of indicating leaks and sample collection volumes. The gauge shall be helium leak tested to 1.5×10^{-7} cc/s, have all stainless steel construction and be capable of tolerating temperatures to 125°C • Summa® canisters or equivalent are used to collect samples (Section C1-1a(3))					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
	Sampling Heads Under Drum Lids: Sampling Through a Carbon Filter					
196	Are procedures, process, and equipment adequate to ensure that samples collected through a filter meet the following requirements: • The lid of the drum's 90-mil rigid poly liner shall contain a hole for venting to the drum • That non-vented drums are not sampled until an internal nonconformance report is prepared, submitted, and resolved in order to obtain a representative sample • The filter shall be sealed to prevent outside air from entering the drum • The sampling head for collecting drum headspace gas shall consist of a side-port needle, a filter to prevent particle contamination of the sample, and an adapter to connect the side-port needle to the filter • The sampling head is cleaned or replaced after each use • The housing of the filter shall allow insertion of the sampling needle through the filter element or a sampling port with septum that bypasses the filter element into the drum headspace • The side port needle shall be used to reduce the potential for plugging • The purge assembly shall be modified for compatibility with the side port needle. (Section C1-1a(4)(i))					
	Sampling Heads Under Drum Lids: Sampling Through the Drum Lid					
197	Are procedures in place to establish the criteria for sampling through the drum lid as opposed to sampling through a filter? (Section C1-1a(4)(ii))					
197a	If sampling through a pipe overpack container filter vent hole with an airtight device is used, are procedures in place to ensure that a sampling head with an airtight seal for sampling through a pipe overpack container filter vent hole are available? (Section C1-1a(4)(iii))					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
197b	If sampling through a pipe overpack container filter vent hole is used, are the following criteria met? • The seal between the pipe overpack container surface and sampling apparatus shall be designed to minimize intrusion of ambient air. • The filter shall be replaced as quickly as is practicable with the airtight sampling apparatus to ensure that a representative sample can be taken. • All components of the sampling system that come into contact with sample gases shall be cleaned according to requirements for direct canister sampling or manifold sampling, whichever is appropriate, prior to sample collection. • Equipment blanks and field reference standards shall be collected through all the components of the sampling system that contact the headspace-gas sample. • During sampling, openings in the pipe overpack container shall be sealed to prevent outside air from entering the container. • A flow-indicating device shall be connected to sampling system and operated according to the direct canister or manifold sampling requirements, as appropriate. (Section C1-1a(4)(iii))					
197c	If sampling through a pipe overpack container filter vent hole is used, are the following criteria met? • The site has documentation that demonstrates that they have determined through testing the appropriate length of time for exchanging the filter with the sampling device to assure representative samples are collected. (Section C1-1a(4)(iii))					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
198	Are procedures, process, and equipment adequate to ensure that samples collected through the drum lid by punching meet the following requirements: • The lid of the drum's 90-mil rigid poly liner shall contain a hole for venting to the drum. If the DAC for Scenario 1 is met, a sample may be collected from inside the 90-mil rigid poly liner. • If headspace gas samples are collected from the drum headspace prior to venting the 90-mil rigid poly liner, the sample is not acceptable and a nonconformance report shall be prepared, submitted, and resolved. • The drum lid shall be breached using a punch that forms an airtight seal between the drum lid and the manifold or canister • The seal between the drum lid and the sampling head shall be designed to minimize the intrusion of ambient air • All components of the sampling system that come in contact with sample gases shall be purged with humidified zero air, nitrogen, or helium prior to sample collection • Equipment blanks and field reference standards shall be collected through all components of the punch that contact the headspace gas sample • Pressure shall be applied to the punch until the drum lid has been breached • Provisions shall be made to relieve excessive drum pressure increases during drum punch operations; potential pressure increases may occur during sealing of the drum punch to the drum lid • The filter is sealed to prevent outside air from entering the drum (Section C1-1a(4)(ii))					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
198a	• A flow indicating device or pressure regulator to verify flow of gases shall be pneumatically connected to the drum punch and operated in the same manner as the flow indicating device • Equipment are used to secure the drum punch sampling system to the drum lid • If the headspace gas sample is not taken at the time of drum punching, the presence and diameter of the rigid liner vent hole is documented during the punching operation for use in determining an appropriate Scenario 2 DAC. (Section C1-1a(4)(ii))					
	Quality Control Sample Collection					
199	Are procedures in place to ensure that the following QC sample requirements are met: • Field QC samples are collected on per sample batch basis for manifold and direct canister sampling. A sampling batch is defined as up to 20 samples collected within 14 days of the first sample • Field samples are collected and analyzed on a per on-line batch basis for on-line sampling/analysis systems. An on-line batch is defined as the number of headspace gas samples that are collected within a 12 hour period from the same on-line integrated analysis system • For the manifold sampling method, field blanks, equipment blanks, field duplicates, and field reference samples are collected prior to sample collection on a per sampling batch basis or one per day, whichever is more frequent • For the direct canister sampling method field blanks and field duplicates are collected on a per sampling batch basis prior to sample collection; while equipment blanks and field reference samples are collected after equipment purchase, cleaning, and assembly					
199a	• For the On-line sampling method, field blanks, equipment blanks, field duplicates, and field reference samples are collected on a per on-line batch basis. *(Note: The on-line blank replaces the laboratory and equipment blanks, the on-line duplicate replaces the field duplicate and the laboratory duplicate, and the on-line sample control replace the field reference standard and the laboratory control sample.)* (Section C1-1b, C1-1b(1), C1-1b(2), C1-1b(3), C1-1b(4))					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
200	Do procedures adequately assign the Site Project QA Officer with the responsibility of monitoring field QC results and initiate the nonconformance report process in the event the following acceptance criteria are not met or sample collection frequencies are not met: • Field and equipment blanks shall be less than 3 times the detection limits specified in Table C3-2 and equipment blank results determined by FTIR shall be less than the PRQL specified in Table C3-2 (Section C1-1b(1) and C1-1b(2)) • Field reference standards shall have a recovery of between 70 and 130% (Table C1-3) • Field Duplicates shall have an RPD of less than or equal to 25 C1-1b(4); Table C1-3)					
201	Are procedures in place to ensure that field reference standards meet the following criteria: • Field reference standards shall contain a minimum of 6 analytes listed in Table C3-2 at a range of between 10 and 100 ppmv and at concentrations greater than the MDL • Field reference standards shall be traceable to a nationally recognized standard, if available • If commercial gases are used, they shall be accompanied by a Certificate of Analysis and all field reference standards are traceable to certificates. • Commercial gases are not used past the manufacturer specified shelf life. • Field reference samples are submitted blind to the laboratory at a frequency of one per sampling batch. (Note: Field reference standards may be discontinued for direct canister method if QAO accuracy objectives are met) (Section C1-1b(3))					
202	Are procedures in place to ensure that field duplicate samples are collected sequentially and in accordance with Table C1-1. (Section C1-1b(4))					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
	Sample Equipment Testing, Inspection and Maintenance					
203	Are procedures in place to ensure that sample containers are cleaned in accordance with the following specifications: • All sampling components that contact sample gases are constructed of inert materials such as stainless steel or Teflon® • The sampling manifold and canisters are properly cleaned and leak checked prior to each sampling event in accordance to or equivalent with TO-14A or TO-15 methodology • SUMMA® canisters or equivalent are cleaned on an equipment cleaning batch basis. An equipment cleaning batch is defined as the number of canisters that can be cleaned together at one time using the same cleaning method • The cleaning system consists of an optional oven and a vacuum manifold which uses a dry vacuum pump or a cryogenic trap backed by an oil sealed pump • Prior to cleaning a 24 hour leak check shall be performed (+/- 2 psig) on all canisters • Canisters that shall be checked for leaks, repaired, and reprocessed • One canister per equipment cleaning batch is filled with humid zero air or humid high purity nitrogen and analyzed for VOCs • A batch is considered clean if VOC concentrations are less than 3 times the MDLs specified in Table C3-2 • Certified leak-free canisters are evacuated to 0.1 mm Hg or less for storage • Canister cleaning certification documentation is available at the cleaning facility and the cleaning facility initiates canister tags. (Section C1-1c, C1-1c(1))					
204	Are procedures in place to ensure that manifold pressure sensors and ambient air temperature sensors are certified prior to initial use and annually using NIST traceable standards. In addition OVAs if used shall be calibrated daily using known calibration gases and the balance of the OVA calibration is consistent with the manifold purge gas. (Section C1-1d)					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
205	Are procedures in place to ensure that sampling equipment are cleaned and leak checked using the following specifications: • Surfaces of all sampling equipment that will come in contact with sample gases are thoroughly inspected and cleaned prior to assembly • Manifolds and sampling heads shall be purged with humidified zero air, nitrogen, or helium and leak checked after assembly • The cleaning shall be repeated if routine system cleaning is inadequate • Manifolds and sampling heads which are reused shall be cleaned and leak checked according to procedures in the EPA's Compendium Method TO-14A or TO-15 after sample collection, field duplicate collection, field blank collection, and after the additional cleaning require for field reference samples. All manifold ports shall be capped or closed with valves (sample canisters may be attached as well) • Manifolds are cleaned by heating the sample side of the manifold to 150°C and periodically evacuated and flushed with humidified zero air, nitrogen, or helium • Manifolds not in use are demonstrated as clean before storage with a positive pressure of humidified zero air, nitrogen, or helium gas in the sampling and standard sides • Sampling is suspended when the analysis of an equipment blank indicated the VOC limits have been exceeded or if a leak test fails. • Sampling systems are cleaned after field reference standard collection by installing a gas tight connector in place of the sampling head, between the flexible hose and purge assembly. This allows the sample and standard side to be flushed with humidified zero air, nitrogen, or helium in conjunction with heated pneumatic lines • Needles, airtight fitting or seal, adapters, and filters are cleaned in accordance with the EPA Method TO-14A or TO-15 procedures. Sample heads shall be discarded or cleaned according to Method TO-15. In addition, the needle, the airtight fitting and seal, and the filter should be purged with zero air, nitrogen, or helium and capped for storage (Section C1-1c(2) , Section C1-1c(3), Section C1-1c(4), and Section C1-c(5))					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
	Sample Handling and Custody					
207	Do formats for field logs and custody records specify documentation of the following information: • Name of sampling facility • Waste container identification number • Sample identification number of each sample referenced to waste container • Sample matrix • Time and date of sample collection • Type/number and size of sample container(s) • Method of sample preservation • Requested analyses • Sampler(s) name through signature • Signatures of custodians relinquishing and receiving custody of samples including date and time of transfer until time of final disposition • Analytical laboratory • Off-site shipping information (date, time, shipper, mode, air bill or lading number) (Section C1-5)					
208	Are procedures are in place to ensure that samples and sampling equipment are identified with unique identification numbers? (Section C1-5)					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
209	Do sample tags or labels contain the following information: • Sample Description • Ambient temperature and pressure • Sample identification number • Analyses requested • Date/Time of collection • QC Designation (if applicable) • Sampler's initials and organization (Section C1- 5)					
210	All sampling equipment, canisters, and samples are identified with unique identification numbers that are traceable to equipment cleaning batches. (Section C1- 5)					
211	Are procedures in place to ensure samples are sealed with intact custody seals and that one or more of the following custody conditions are met: • It is in the possession of an authorized individual • It is in the view of an authorized individual, after being in the possession of that individual • It was in the possession of an authorized individual and access to the sample was controlled by locking or placement of signed custody seals that prevent undetected access • It is in a designated secure area, such as a controlled access location with complete documentation of personnel access or a radiological containment area (hot cell or glove box) (Section C1- 5)					
212	Are procedures in place to ensure that discrepant sample information, indications of damage, or indications of tampering are documented? (Section C1- 5)					
214	Are procedures in place to ensure that sample custody is maintained until the sample is released by the site project manager or expended? (Section C1- 5)					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
215	Are procedures in place to ensure that SUMMA canisters are packaged to prevent damage to the pressure gauge or associated connections by packaging in metal boxes with separate compartments or cardboard boxes with foam inserts? (Section C1- 6)					
216	Are procedures in place to ensure that samples are packaged to prevent damage to the sample container and maintain preservation temperature? (Section C1- 6)					
217	Are procedures in place to ensure that adequate cold packs are included in the DOT approved sample shipping container to ensure that all temperature requirements are met? (Section C1- 6)					
218	Are procedures in place to ensure that sample COC forms are secured for shipment to the inside of the sealed or locked shipping container lid and that samples and shipping containers are affixed with tamper proof seals or devices? (Section C1- 6)					
219	Are procedures in place to ensure that an appropriate blank sample is included with each shipment container to detect any VOC cross-contamination? (Section C1- 6)					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
	Laboratory Operations					
220	Are procedures in place to ensure that all VOC analyses are evaluated using the following criteria: • Precision is assessed by analyzing laboratory duplicates, Laboratory Control Sample (LCS) , and PDP blind-audit samples in comparison to Table C3- 2 • Accuracy as %R shall be assessed by analyzing LCS samples and PDP blind-audit samples in comparison to criteria in Table C3-3 • MDLs are expressed in nanograms/ for VOCs and must be less than or equal to those listed in Table 3-2 • Laboratory completeness shall be expressed as the number of samples analyzed with valid results as a percent of the total number of samples submitted for analysis. A composited sample is treated as one sample for the purposes of completeness, because only one sample is run through the analytical instrument • Comparability shall be achieved through the use of standardized methods, traceable standards by requiring successful participation in the PDP program • Representativeness will be achieved by collecting sufficient numbers of samples using clean sampling equipment that does not introduce sample bias. • All method detection limits and program required detection limits shall be less than the Program Required Detection Limits listed in Table C3-2 and the detection limit study procedures shall be documented in laboratory SOPs. In addition, the laboratory shall demonstrate that they are capable of meeting the Program Required Detection Limits by analyzing at least one calibration standard below the PRQL (Section C3-5)					
221	Are procedures in place to ensure that only laboratories that are qualified through participation in the Performance Demonstration Program are eligible to analyze waste samples? (Section C-3a(3))					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
222	Are procedures in place to ensure that Tentatively Identified Compounds shall be added to the target compound list if they are reported in 25% of the waste containers sampled from a given waste stream and if they appear in the 20 NMAC 4.1.200 (incorporating 40 CFR §261) Appendix VIII list? (Section C-3a(1))					
222a	Are procedures documented to ensure that the following criteria are met with regard to the recognition and reporting of TICS for GC/MS Methods for headspace gas sampling: • Relative intensities of major ions in the reference spectrum (ions greater than 10% of the most abundant ion) should be present in the sample spectrum. • The relative intensities of the major ions should agree within ± 20 percent. • Molecular ions present in the reference spectrum should be present in the sample spectrum. • Ions present in the sample spectrum but not in the reference spectrum should be reviewed for possible background contamination or presence of coeluting compounds. • Ions present in the reference spectrum but not in the sample spectrum should be reviewed for possible subtraction from the sample spectrum because of background contamination or coeluting peaks. • The reference spectra used for identifying TICs shall include, at minimum, all of the available spectra for compounds that appear in the 20.4.1.200 NMAC (incorporating 40 CFR Part 261) Appendix VIII list. The reference spectra may be limited to VOCs when analyzing headspace gas samples. • TICs for headspace gas analyses that are performed through FTIR analyses shall be identified in accordance with the specifications of SW-846 Method 8410. (Section C3-1)					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
222b	Are procedures in place to assure that TICs are reported as part of the analytical batch data reports for GC/MS Methods in accordance with the following minimum criteria: • a TIC in an individual container headspace gas or solids sample shall be reported in the analytical batch data report if the TIC meets the SW-846 identification criteria listed above and is present with a minimum of 10% of the area of the nearest internal standard. • a TIC in a composited headspace gas sample that contains 2 to 5 individual container samples shall be reported in the analytical batch data report if the TIC meets the SW-846 identification criteria listed above and is present with a minimum of 2% of the area of the nearest internal standard. • a TIC in a composited headspace gas sample that contains 6 to 10 individual container samples shall be reported in the analytical batch data report if the TIC meets the SW-846 identification criteria listed above and is present with a minimum of 1% of the area of the nearest internal standard. • a TIC in a composited headspace gas sample that contains 11 to 20 individual container samples shall be reported in the analytical batch data report if the TIC meets the SW-846 identification criteria listed above and is present with a minimum of 0.5% of the area of the nearest internal standard. (Section C3-1)					
	Quality Assurance Objectives					
224	Are procedures in place to ensure that the precision of the headspace gas sampling and analysis must be assessed by the sequential collection of field duplicates for manifold sampling operations or simultaneous collection of field duplicates for direct canister sampling operations for VOCs? (Section C3-2)					
225	Are procedures in place to ensure that corrective action will be taken if the duplicate RPD exceeds 25% for any analyte found greater than the PRQL in both of the duplicate samples? (Section C3-2)					
226	Are procedures in place to ensure that the accuracy of headspace gas sampling is assessed through the collection of field reference standards and at a frequency of one field response standard for every 20 containers sampled or per sampling batch and through the collection of equipment blanks at the frequency of one for every equipment cleaning batch? (Section C3-2)					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
227	Are procedures in place to ensure that corrective actions are taken if the field reference standard is less than 70% recovery or greater than 130% and that if the blank concentration for any blank exceeds 3 times the MDL listings in Table C3-2? (Section C3-2)					
228	Are procedures in place to ensure that sampling completeness shall be expressed as the number of valid samples collected as a percent of the total number of samples collected for each waste steam, where a valid sample is defined as a sample collected in accordance with approved sampling methods and the drum was properly prepared for sampling? (Section C3-2)					
229	Are procedures in place to ensure that the minimum sampling completeness percentage for any waste stream is 90 percent? (Section C3-2)					
230	Are procedures in place to ensure that sample comparability is assured through the use and application of uniform procedures and equipment and application of data usability criteria, and that corrective action is taken if the uniform procedures and equipment are not used without approved and justified deviations (Section C3-2)					
231	Are procedures in place to ensure that sample representativeness is maintained (Section C3-2)					

1. The WAP requirements should be presented in documents, such as procedures. Each of the questions posed under WAP requirements are meant to determine whether procedures are in place or whether documents are evident which demonstrate that the specific WAP requirement is or can be met.

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Table C6-5 Radiography Checklist

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Radiography Checklist

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
	Quality Assurance Objectives					
233	Are process procedures in place to meet the following Quality Assurance Objectives? <u>Precision</u> • Does the site describe in its QAPjP and SOP(s) activities to reconcile any discrepancies between two radiography operators with regard to identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases through independent replicate scans and independent observations? And additionally, activities to verify the precision of radiography prior to use by tuning precisely enough to demonstrate compliance with QAOs through viewing an image test pattern? <u>Accuracy</u> • Was accuracy obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the required items in a training container during their initial qualification and subsequent requalification?					
233a	<u>Completeness</u> • Was an audio/videotape (or equivalent media) of the radiography examination and a radiography data form validated according to the requirements in Section C3-10? • Was an audio/videotape (or equivalent media) of the radiography examination and a radiography data form obtained for 100% of the waste containers subject to radiography? <u>Comparability</u> • Is comparability ensured through the use of standardized radiography procedures and operator training and qualifications (Section C3-4a)					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
	Characterization and System Requirements					
234	Does the site have procedures to ensure that radiography is used to identify and verify waste container contents and verify the waste's physical form? Does the site have procedures to identify prohibited materials? (Section C-3c; C1-3)					
235	Do procedures or other supporting documentation ensure that <u>every</u> waste container will undergo radiography and/or VE as necessary to augment AK? (Section C-3c)					
236	Do procedures ensure that containers whose contents prevent full examination are examined by visual examination rather than by radiography unless the site certifies that visual examination would provide no additional relevant information for that container based on the AK information for the waste stream? (Section C1-3)					
237	Do procedures or other supporting documentation ensure that the physical form determined by radiography is compared with the waste stream descriptions? If discrepancies are noted, will a new waste stream be identified? (Section C-3c)					
238	Are there procedures to ensure the data is obtained from an audio/video recorded scan provided by trained radiography operators? (Section C1-3)					
239	Were all activities required to achieve the radiography objective described in site Quality Assurance Project Plans (QAPjPs) and Standard Operating Procedures (SOPs)? (Section C3-4)					
240	Did the radiography system consist of the following equipment or equivalent: • an X-ray producing device? • an imaging system? • an enclosure for radiation protection? • a waste container handling system? • an audio/video recording system or equivalent? • an operator control and data acquisition station? (Section C1-3)					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
241	Did the X-ray producing device have controls which allow the operator to vary voltage, thereby controlling image quality? Was it possible to vary the voltage, typically between 150-400 kV, to provide an optimum degree of penetration through the waste? Was high-density material examined with the X-ray device set on the maximum voltage? Was low-density material examined at lower voltage settings to improve contrast and image definition? (Section C1-3)					
242	Do procedures or other documentation ensure that an audio/videotape or equivalent is made of the waste container scan and maintained as a non-permanent record? (Section C1-3)					
	Data Compilation					
243	Are there procedures to ensure that a radiography data form is used to document the waste matrix code, ensure the waste container contains no ignitable, corrosive or reactive waste by documenting the absence of liquids in excess of TSDF-WAC limits or compressed gases, and verify that the physical form of the waste is consistent with the waste stream description documented on the WSPF? (Section C1-3)					
245	If radiography indicates that the waste does not match the waste stream description, do procedures ensure that the appropriate corrective action was taken? (Section C-3c)					
246	If a discrepancy is noted, do procedures ensure that the proper waste stream assignment is determined, the correct hazardous waste numbers assigned, and the resolution documented? (Section C-3c)					
	Training					
247	Do site procedures ensure that only trained personnel are allowed to operate radiography equipment? (Section C1-3)					
248	Do site procedures ensure that training requirements for radiography operators is based upon existing industry standard training requirements? (Section C1-3)					
249	Does the documented training program provide radiography operators with both formal and on-the-job training (OJT)? (Section C1-3)					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
250	Does the documented training program ensure that the radiography operators are instructed in the specific waste generating practices and typical packaging configurations expected to be found in each waste stream at the site? (Section C1-3)					
251	Does the documented training program ensure that the OJT and apprenticeship are conducted by an experienced, qualified radiography operator prior to qualification of the candidate? (Section C1-3)					
252	Is the documented training program site specific? (Section C1-3)					
262	Does the documented training program ensure that a training drum with various container sizes is scanned by each operator on a semiannual basis? Is the videotape reviewed by a supervisor to ensure that operators' interpretations remain consistent and accurate? (Section C1-3)					
263	Do site procedures ensure that the site prepares Testing Batch Data Reports or equivalent which includes all data pertaining to radiography for up to 20 waste containers without regard to waste matrix? (Section C3-10)					
	Quality Assurance					
265	Does the documented training program ensure that the imaging system characteristics are verified on a routine basis? (Section C1-3)					
266	Do procedures ensure that independent replicate scans and replicate observations of the video output of the radiography process are performed under uniform conditions and procedures? Are independent replicate scans performed on one waste container per day or per testing batch of 20 samples, which ever is less frequent, by a qualified radiography operator that was not involved in the original scan of the waste container? Are independent observations of one scan (not the replicate scan) performed once per day or per testing batch, which ever is less frequent, by a qualified radiography operator that was not involved in the original scan of the waste container? (Section C1-3)					
267	Do procedures ensure that oversight functions include periodic audio/video media reviews of accepted waste containers, are performed by qualified radiography operators that were not involved in the original scans of the waste containers? (Section C1-3)					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
268	Is the site project manager responsible for monitoring the quality of the radiography data and calling for corrective action, when necessary? (Section C1-3)					
	Data Validation, Review, Verification and Reporting					
277	Do procedures ensure that all applicable data generation review verification and validation activities specified in C3-10 are followed, including all signatory releases? (Section C3-10)					
278	Do procedures ensure that radiography tapes have been reviewed at a frequency of one waste container per day or once per testing batch, whichever is less frequent, to ensure data are correct and completed? (Section C1-3)					
279	Do procedures ensure that all applicable project-level signatory releases and DQOs (Section C3-11) as specified in the WAP are performed? (Section C3-10b)					
282	At the data generation level, do procedures ensure that all electronic and video data stored appropriately to ensure that waste container, sample, and associated QA data are readily retrievable? Are radiography tapes reviewed, at a frequency of one waste container per day or once per testing batch, whichever is less frequent, against the data reported on the radiography form? (Section C3-10a, C3-10a(1))					
283	At the project level, do procedures require the Site Project Manager to certify that the radiography data are complete and acceptable based on the videotape review of at least one waste container per testing batch or daily, whichever is less frequent? (Section C3-10b(1))					

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Table C6-6 Visual Examination (VE) Checklist

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Visual Examination (VE) Checklist

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
	Training					
296	Is there documentation which shows that a standardized training program for visual examination operators has been developed? Is it specific to the site and include the various waste configurations generated/stored at the site? (Section C1-4)					
297	Is there documentation which shows that the visual examination operators receive training on the specific waste generating processes, typical packaging configurations, and waste material parameters expected to be found in each Waste Matrix Code at the site? (Section C1-4)					
298	Are the visual examination personnel requalified once every two years? (Section C1-4)					
298a	Does the training include the following regardless of Summary Category Group? • Identifying and describing the contents of a waste container by examining all items in waste containers of previously packaged waste. • Identifying when VE cannot be used to meet the DQOs, (Section C1-4)					
	Visual Examination Expert Requirements					
300	Does documentation ensure that the site has designated a visual examination expert? Is the visual examination expert familiar with the waste generating processes that have taken place at the site? Is the visual examination expert familiar with all of the types of waste being characterized at that site? (Section C1-4)					
301	Does documentation ensure that the visual examination expert shall be responsible for the overall t direction and implementation of the visual examination aspects of the program? Does the site's QAPjP specify the selection, qualification, and training requirements of the visual examination expert? (Section C1-4)					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
	Visual Examination Procedures					
304	Do procedures indicate that all visual examination activities are documented on video/audio media or VE performed by using a second operator to provide additional verification by reviewing the contents of the waste container to ensure correct reporting? (Section C1-4)					
304a	Are procedures in place to ensure that when VE is performed using a second operator, each operator performing VE shall observe for themselves the waste being placed in the container or the contents within the examined waste container when waste is not removed? (Section C1-4)					
313	Do site procedures ensure that when liquid is found, the non-transparent internal container holding the liquid will be assumed to be filled with liquid and this volume will be added to the total liquid in the container being characterized using VE? The container being characterized using VE would then be rejected and/or repackaged to exclude the internal container if it is over the TSDF-WAC limits. (Section C-3c)					

	WAP Requirement[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
	Quality Assurance Objectives					
314	Are process procedures in place to meet the following Quality Assurance Objectives? <u>Precision</u> • Precision is maintained by reconciling any discrepancies between the operator and the independent technical reviewer with regard to identification of waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases. <u>Accuracy</u> • Accuracy is maintained by requiring operators to pass a comprehensive examination and demonstrate satisfactory performance in the presence of the VE expert during their initial qualification and subsequent requalification. <u>Completeness</u> • A validated VE data form will be obtained for 100 percent of the waste containers subject to VE. <u>Comparability</u> • The comparability of VE data from different operators shall be enhanced by using standardized VE procedures and operator qualifications. (Section C3-4b)					

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