ATTACHMENT C3

QUALITY ASSURANCE OBJECTIVES AND DATA VALIDATION TECHNIQUES FOR WASTE CHARACTERIZATION METHODS

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C3-1 Validation Methods

The Permittees shall require the generator/storage sites (**sites**) to perform data validation so that data used for Waste Isolation Pilot Plant (**WIPP**) compliance programs will be of known and acceptable quality.

The qualitative data or descriptive information generated by radiography and visual examination is not amenable to statistical data quality analysis. However, radiography and visual examination are complementary techniques yielding similar data for determining the waste matrix code. The waste matrix code is determined to ensure that the container is properly included in the appropriate waste stream.

Data validation will be used to assess the quality of waste characterization data collected based upon project precision, accuracy, completeness, comparability, and representativeness objectives. These objectives are described below:

Precision

Precision is a measure of the mutual agreement among multiple measurements.

Accuracy

Accuracy is the degree of agreement between a measured result and the true or known value.

Completeness

Completeness is a measure of the amount of valid data obtained from a method compared to the total amount of data obtained.

Comparability

Comparability is the degree to which one data set can be compared to another.

Representativeness

Representativeness is the degree to which a sample represents a characteristic of a population.

C3-2 Non Destructive Examination Methods

Quality Assurance Objectives

The quality assurance objectives (**QAOs**) for non-destructive examination (**NDE**) methods are detailed in this section. Non-destructive examination can be either radiography or visual examination (**VE**). If the QAOs described below are not met, then corrective action shall be taken. It should be noted that NDE is primarily a qualitative determination. The objective of NDE

for the program is to verify that the physical form of the waste matches the waste stream description as determined by acceptable knowledge (**AK**) and the absence of prohibited items. The Permittees shall require each site to describe activities required to achieve these objectives in the site quality assurance project plan (**QAPjP**) and standard operating procedures (**SOPs**).

C3-2a Radiography

Data to meet these objectives must be obtained from a video and audio recorded scan provided by trained radiography operators at the sites. Results must also be recorded on a radiography data form. The precision, accuracy, completeness, and comparability objectives for radiography data are presented below.

Precision

Precision is maintained by reconciling any discrepancies between two radiography operators with regard to identification of the waste matrix code, liquids in excess of Treatment, Storage, and Disposal Facility Waste Acceptance Criteria (**TSDF-WAC**) limits, and compressed gases through independent replicate scans and independent observations. Additionally, the precision of radiography is verified prior to use by tuning precisely enough to demonstrate compliance with QAOs through viewing an image test pattern.

Accuracy

Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the items required to meet the data quality objectives (**DQOs**) for radiography specified in Permit Attachment C, Section C-4a(1) in a training container during their initial qualification and subsequent requalification.

Completeness

A video and audio media recording of the radiography examination and a validated radiography data form will be obtained for 100 percent of the waste containers subject to radiography. Video and audio media recordings and radiography data forms will be subject to validation as indicated in Section C3-4.

Comparability

The comparability of radiography data from different operators shall be enhanced by using standardized radiography procedures and operator qualifications.

C3-2b Visual Examination

Results must be recorded on a VE data form. The precision, accuracy, completeness, and comparability objectives for VE data are presented below.

Precision

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.

Accuracy

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. Visual examination operators shall be requalified every two years.

Completeness

A validated VE data form will be obtained for 100 percent of the waste containers subject to VE.

Comparability

The comparability of VE data from different operators shall be enhanced by using standardized VE procedures and operator qualifications.

C3-3 Acceptable Knowledge

Acceptable knowledge provides primarily qualitative information that cannot be assessed according to specific data quality goals that are used for quantitative techniques. To ensure that the AK process is consistently applied, the Permittees shall require sites to comply with the following data QAOs for AK:

- Precision - The qualitative determinations, such as compiling and assessing AK, do not lend themselves to statistical evaluations of precision. However, the AK will be addressed by independent reviews during internal and external audits.

- Accuracy - The percentage of waste containers which require reassignment to a new waste matrix code and/or designation of different U.S. Environmental Protection Agency (**EPA**) hazardous waste numbers based on testing data and discrepancies identified by the Permittees during waste confirmation will be reported as a measure of AK accuracy.

- Completeness - The AK record must contain 100 percent of the required information (Permit Attachment C4, Section C4-3). The usability of the AK information will be assessed for completeness during audits.

- Comparability - Comparability is ensured through sites meeting the training requirements and complying with the minimum standards outlined for procedures that are used to implement the AK process. All sites must assign hazardous waste numbers in accordance with Permit Attachment C4-3b and provide this information regarding its waste to other sites who store or generate a similar waste stream.

- Representativeness - Representativeness is a qualitative parameter that will be satisfied by ensuring that the process of obtaining, evaluating, and documenting AK information is performed in accordance with the minimum standards established in Permit Attachment C4, Section C4-3. Sites also must assess and document the limitations of the AK information used to assign EPA hazardous waste numbers (e.g., purpose and scope of information, date of publication, type and extent to which waste parameters are addressed).

The Permittees shall require each generator/storage site to comply with the nonconformance notification and reporting requirements of Section C3-7 if the results of testing specified in Permit Attachment C are inconsistent with AK.

The Permittees shall require each site to address quality control by tracking its performance with regard to the use of AK by: 1) assessing the frequency of inconsistencies among information, and 2) documenting AK inconsistencies identified through radiography and visual examination. In addition, the AK process and waste stream documentation must be evaluated through internal assessments by generator/storage site quality assurance organizations and assessments by auditors external to the organization (i.e., the Permittees).

C3-4 Data Review, Validation, and Verification Requirements

Procedures shall be developed for the review, validation, and verification of data at the data generation level; the validation and verification of data at the project level; and the verification of data at the Permittee level. Data review determines if raw data have been properly collected and ensures raw data are properly reduced. Data validation verifies that the data reported satisfy the requirements of this Waste Analysis Plan (**WAP**) and is accompanied by signature release. Data verification authenticates that data as presented represent the testing activities as performed and have been subject to the appropriate levels of data review. The requirements presented in this section ensure that WAP records furnish documentary evidence of quality.

The Permittees shall require the sites to generate the following Batch Data Reports (**BDRs**) for data validation, verification, and quality assurance activities:

- A Testing BDR or equivalent includes data pertaining to radiography or visual examination for up to 20 waste containers without regard to waste matrix. Table C3-3 lists the information required in Testing BDRs (identified with an “X”) and other information that is necessary for data validation but is optional in Testing BDRs (identified with an “O”).

C3-4a Data Generation Level

The following are minimum requirements for raw data collection and management which the Permittees shall require for each site:

- Raw data shall be signed and dated in reproducible ink by the person generating it. Alternately, unalterable electronic signatures may be used.

- Data must be recorded clearly, legibly, and accurately in field records.

- Changes to original data must be lined out, initialed, and dated by the individual making the change. A justification for changing the original data may also be included. Original data must not be obliterated or otherwise disfigured; original data must be readable. Data changes shall only be made by the individual who originally collected the data or an individual authorized to change the data.

- Data must be transferred and reduced from field records completely and accurately.

- Field records must be maintained as specified in Permit Attachment C, Table C-2.

- Data must be organized into a standard format for reporting purposes (BDR), as outlined in specific testing procedures.

- Electronic and video data must be stored appropriately to ensure that waste container and associated quality control (**QC**) data are readily retrievable. In the case of classified information, additional security provisions may apply that could restrict retrievability. The additional security provisions will be documented in generator/storage site procedures as outlined in the QAPjP in accordance with prevailing classified information security standards.

Data review, validation, and verification at this level involves scrutiny and signature release from qualified independent technical reviewer(s) not involved in the generation or recording of the data under review, as specified below. Individuals conducting this data review, validation, and verification must use checklists that address the items included in this section. Completed checklists must be forwarded with BDRs to the project level.

C3-4a(1) Independent Technical Review

The independent technical review ensures by review of raw data that data generation and reduction are technically correct; calculations are verified correct; deviations are documented; and quality assurance (**QA**)/QC results are complete, documented correctly, and compared against WAP criteria. This review validates and verifies the work documented by the originator.

One hundred percent of the BDRs must receive an independent technical review by a trained and qualified individual who was not involved in the generation or recording of the data under review. This review shall be performed by an individual other than the data generator who is qualified to have performed the initial work. The independent technical review must be performed as soon as practicably possible in order to determine and correct negative quality trends in the testing process. However, at a minimum, the independent technical review must be performed before any waste associated with the data reviewed is managed, stored, or disposed at the WIPP facility. The reviewer(s) must release the data as evidenced by signature, and as a consequence ensure the following:

- Data generation and reduction were conducted in a technically correct manner in accordance with the methods used (procedure with revision). Data were reported in the proper units and correct number of significant figures.

- Calculations have been verified by a valid calculation program, a spot check of verified calculation programs, and/or 100 percent check of hand calculations. Values that are not verifiable to within rounding or significant difference discrepancies must be rectified prior to completion of independent technical review.

- The data have been reviewed for transcription errors.

- The testing data QA documentation for BDRs is complete and includes, as applicable, raw data, calculation records, calibration records (or references to an available calibration package). Corrective action will be taken to ensure that BDRs

are complete and include necessary raw data prior to completion of the independent technical review.

- Radiography tapes have been reviewed (independent observation) on a waste container basis at a minimum of once per testing batch or once per day of operation, whichever is less frequent (Attachment C1, Section C1-1). The radiography tape will be reviewed against the data reported on the radiography form to ensure that the data are correct and complete.

- QAOs have been met according to the methods outlined in Sections C3-2 and C3-3.

C3-4b Project Level

Data validation and verification at this level involves scrutiny and signature release from the Site Project Manager (or designee). The Permittees shall require each site to meet the following minimum requirements for each waste container. A nonconformance identified during this process shall be documented on a nonconformance report (Section C3-7).

The Site Project Manager shall ensure that a repeat of the data generation level review, validation, and verification is performed on the data for a minimum of one randomly chosen waste container quarterly (every three months). This exercise will document that the data generation level review, validation, and verification is being performed according to implementing procedures.C3-4b(1) Site Project Manager Review

The Site Project Manager Review is the final validation that the data contained in BDRs from the data generation level are complete and have been properly reviewed as evidenced by signature release and completed checklists.

One hundred percent of the BDRs must have Site Project Manager signature release. At a minimum, the Site Project Manager signature release must be performed before any waste associated with the data reviewed is managed, stored, or disposed at the WIPP facility. This signature release must ensure the following:

- Testing batch QC checks (e.g., replicate scans, measurement system 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, as specified in Permit Attachment C1, Section C1-1.

- 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 are properly reported (e.g., data are reported in the correct units, and with the correct number of significant figures).

- Verify that data are within established data assessment criteria and meet the applicable QAOs (Sections C3-2 and C3-3).

C3-4b(2) Prepare Site Project Manager Summary and Data Validation Summary

To document the project-level validation and verification described above, the Permittees shall require each Site Project Manager (or designee) to prepare a Site Project Manager Summary and a Data Validation Summary. These reports may be combined to eliminate redundancy. The Site Project Manager Summary includes a validation checklist for each BDR. Checklists for the Site Project Manager Summary must be sufficiently detailed to validate aspects of a BDR that affect data quality. The Data Validation Summary provides verification that, on a per waste container basis as evidenced by BDR reviews, data have been validated in accordance with the site QAPjP. The Data Validation Summary must identify each BDR reviewed (including waste container numbers), describe how the validation was performed and whether or not problems were detected (e.g., nonconformance reports), and include a statement indicating that the data are acceptable. Summaries must include release signatures.

C3-4b(3) Prepare Waste Stream Characterization Package

In the event the Permittees request detailed information on a waste stream, the Site Project Manager will provide a Waste Stream Characterization Package. The Site Project Manager must ensure that the Waste Stream Characterization Package (Section C3-6b(3)) will support waste characterization determinations.

C3-4c Permittee Level

The final level of data verification occurs at the Permittee level and must, at a minimum, consist of reviewing a sample of the BDRs during audits of generator/storage sites to verify completeness. During such audits, the DOE is responsible for the verification that BDRs include the following:

- Project-level signature releases

- Listing of the waste containers being presented in the report

- Listing of the testing, batch numbers associated with each waste container being reported in the package

- Site Project Manager Summary

- Data Validation Summary

For each Waste Stream Profile Form (**WSPF**) submitted for approval, DOE must verify that each submittal (i.e., WSPF and Characterization Information Summary) is complete and notify the originating site in writing of the WSPF approval. The DOE will maintain the data as appropriate for use in the regulatory compliance programs. For subsequent shipments made after the initial

WSPF approval, the verification will also include WWIS internal limit checks (Permit Attachment C, Section C-5a(1)).

C3-5 Reconciliation with Data Quality Objectives

Reconciling the results of waste testing with the DQOs provides a way to ensure that data will be of adequate quality to support the regulatory compliance programs. Reconciliation with the DQOs will take place at both the project level and the Permittees' level. At the project level, reconciliation will be performed by the Site Project Manager, while at the Permittees' level, reconciliation will be performed as described below.

C3-5a Reconciliation at the Project Level

The Permittees shall require each Site Project Manager to ensure that the data generated and used in decision making meet the DQOs provided in Permit Attachment C, Section C-4a(1). To do so, the Site Project Manager must assess whether data of sufficient type, quality, and quantity have been collected. For each waste stream characterized, the Permittees shall require each Site Project Manager to determine if sufficient data have been collected to determine the following WAP-required waste parameters, as applicable:

- Waste matrix code
- Waste material parameter weights
- If each waste container of waste contains transuranic (**TRU**) radioactive waste
- Whether the waste stream exhibits a toxicity characteristic (**TC**) under 20.4.1.200 New Mexico Administrative Code (**NMAC**) (incorporating Title 40 of the Code of Federal Regulations (**CFR**) Part 261, Subpart C)
- Whether the waste stream contains listed waste found in 20.4.1.200 NMAC (incorporating 40 CFR Part 261, Subpart D)
- Whether the waste stream can be classified as hazardous or nonhazardous
- Whether the overall completeness, comparability, and representativeness QAOs were met for each of the testing procedures as specified in Sections C3-2 and C3-3 prior to submittal of a WSPF for a waste stream or waste stream lot.

If the Site Project Manager determines that insufficient data have been collected to make the determinations listed above, additional data collection efforts must be undertaken. The reconciliation of a waste stream shall be performed, as described in Permit Attachment C4, prior to submittal of WSPF and Characterization Information Summary (**CIS**) to the Permittees for that waste stream. The Permittees shall not manage, store, or dispose a TRU mixed waste stream at the WIPP facility unless the Site Project Manager determines that the WAP-required waste parameters listed above have been met for that waste stream.

C3-5b Reconciliation at the Permittee Level

The Permittees must also ensure that data of sufficient type, quality, and quantity are collected to meet WAP DQOs. The Permittees will ensure sufficient data have been collected to determine if the waste characterization information is adequate to demonstrate the Permittees' compliance with Permit Attachment C, Section C-4a(1). This is performed during the Permittees' review of the WSPF and CIS and is documented by the DOE's approval of the WSPF.

C3-6 Data Reporting Requirements

Data reporting requirements define the type of information and the method of transmittal for data transfer from the data generation level to the project level and from the project level to the Permittees.

C3-6a Data Generation Level

Data shall be transmitted by hard copy or electronically (provided a hard copy is available on demand) from the data generation level to the project level. Transmitted data shall include BDRs and data review checklists. The BDRs and checklists used must contain the information required by the testing techniques described in Permit Attachments C1 through C6, as well as the signature releases to document the review, validation, and verification as described in Section C3-4. Batch Data Reports and checklists shall be in approved formats, as provided in site-specific documentation.

Batch Data Reports shall be forwarded to the Site Project Manager. Batch Data Reports shall be assigned serial numbers, and each page shall be numbered. The identification number used for BDRs can be the same as the testing batch number.

Quality assurance documentation, including raw data, shall be maintained in either testing facility files, or site project files for those facilities located on site in accordance with the document storage requirements of site approved site QAPjPs.

C3-6b Project Level

The site project office shall prepare a WSPF for each waste stream certified for shipment to the WIPP facility based on information obtained from AK and BDRs, if applicable. In addition, the site project office must ensure that the CIS and the Waste Stream Characterization Package (when requested by the Permittees) are prepared as appropriate. The Site Project Manager must also verify these reports are consistent with information found in batch reports. Summarized testing data are included in the CIS. The contents of the WSPF, CIS, and Waste Stream Characterization Package are discussed in the following sections.

After approval of a WSPF and the associated CIS by the DOE, the generator/storage site are required to maintain a cross reference of container identification numbers to each BDR.

A Waste Stream Characterization Package shall be transmitted by hard copy or electronically from the Site Project Manager to the Permittees when requested.

C3-6b(1) Waste Stream Profile Form

The WSPF (Permit Attachment C, Figure C-1) shall include the following information:

- 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
- The 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 AK documentation used to identify the waste stream
- The waste characterization procedures used and the revision number and date of the procedure
- Certification signature of Site Project Manager, name, title, and date signed

C3-6b(2) Characterization Information Summary

The CIS shall include the following elements, if applicable:

- Data reconciliation with DQOs
- Radiography and VE summary to document that prohibited items are absent in the waste and to verify that the physical form of the waste matches the waste stream description as determined by AK (if applicable).
- A justification for the selection of radiography and/or VE as an appropriate method for characterizing the waste.

- A complete listing of the container identification numbers used to generate the WSPF, cross-referenced to each BDR.

- 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 TRU Waste Baseline Inventory Report information, waste stream description, areas of operation, generating processes, Resource Conservation and Recovery Act determinations, radionuclide information, the 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 AK Sufficiency Determinations requested for the waste stream, if applicable.

- Certification through AK or testing that any waste assigned the EPA 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.

C3-6b(3) Waste Stream Characterization Package

The Waste Stream Characterization Package includes the following information:

- Waste Stream Profile Form (Section C3-6b(1))

- Accompanying CIS (Section C3-6b(2))

- Complete AK summary (Section C3-6b(2))

- Batch Data Reports supporting the characterization of the waste stream and any others requested by the Permittees

- Raw testing data requested by the Permittees

C3-6b(4) WIPP Waste Information System Data Reporting

The WIPP Waste Information System (**WWIS**) Data Dictionary includes the data fields, the field format and the limits associated with the data as established by this WAP. These data will be subjected to edit and limit checks that are performed automatically by the database, as defined in the *Waste Data System User's Manual* (DOE, 2019).

C3-7 Nonconformances

The Permittees shall require the status of work and the WAP activities at participating generator/storage sites to be monitored and controlled by the Site Project Manager. This monitoring and control shall include nonconformance identification, documentation, and reporting.

The nonconformances and corrective action processes specified in this section describe procedures between the Permittees and the generator/storage sites as the means to control and disposition nonconforming items and nonconforming activities.

Nonconformances

Nonconformances are uncontrolled and unapproved deviations from any applicable approved plan or procedure. Nonconforming items and nonconforming activities are those that do not meet the WAP requirements, procurement document criteria, or approved work procedures. Nonconforming activities shall be identified and noted in applicable generator site corrective action documents, such as Generator Site Technical Reviews (**GSTRs**) or comparable site-specific reviews and assessments. Nonconforming items shall be identified by marking, tagging, or segregating, and the affected generator/storage site(s) notified. 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 has been dispositioned in accordance with DOE's Quality Assurance Program Description (**QAPD**). Disposition of nonconforming items or nonconforming activities shall be identified and documented. The QAPjPs shall identify the person(s) responsible for evaluating and dispositioning nonconforming items or nonconforming activities and shall include referenced procedures for handling them. For each container selected for confirmation pursuant to Permit Attachment C7, the Permittees will examine the respective NCR documentation to verify NCRs have been dispositioned for the selected container.

Management shall foster a "no-fault" attitude to encourage the identification of nonconforming items and processes. Nonconformances may be detected and identified by anyone performing WAP activities or non-WAP RCRA related activities (i.e., site-specific reviews and assessments, such as GSTRs, affecting WIPP Permit compliance), including

- Project staff - during field operations, supervision of subcontractors, data validation and verification, and self-assessment

- Testing Facility staff - during the preparation for and performance of laboratory testing; calibration of equipment; QC activities; data review, validation, and verification; and self-assessment

- QA personnel - during oversight activities or audits

A NCR shall be prepared for each nonconformance identified. Each NCR shall be initiated by the individual(s) identifying the nonconformance. The NCR shall then be processed by knowledgeable and appropriate personnel. For this purpose, a NCR including, or referencing as appropriate, results of QC tests, audit reports, internal memoranda, or letters shall be prepared. The NCR must provide the following information:

- Identification of the individual(s) identifying or originating the nonconformance
- Description of the nonconformance
- Method(s) or suggestions for correcting the nonconformance (corrective action)
- Schedule for completing the corrective action
- An indication of the potential ramifications and overall usability of the data, if applicable
- Any approval signatures specified in the site nonconformance procedures

The Permittees shall require the Site Project Manager to oversee the NCR process and be responsible for developing a plan to identify and track nonconformances and report this information to the Permittees. The Site Project Manager is also responsible for notifying project personnel of the nonconformance and verifying completion of the corrective action for nonconformances.

Nonconformance to DQOs

For any non-administrative nonconformance related to applicable requirements specified in this WAP which are first identified at the Site Project Manager signature release level (i.e., a failure to meet a DQO), the Permittees shall receive written notification within seven calendar days of identification and shall also receive a NCR within 30 calendar days of identification of the incident. The DOE shall require the generator/storage site to implement a corrective action which remedies the nonconformance prior to management, storage, or disposal of the waste at the WIPP facility. The Permittees shall send NMED a monthly summary of nonconformances identified during the previous month, indicating the number of nonconformances received and the generator/storage sites responsible. If nonconformances are not identified in a given month, a report is not required.

DOE's Corrective Action Process

The DOE shall initiate a corrective action process when internal nonconformances and nonconformances at the generator/storage sites are identified. Activities and processes that do not meet requirements are documented as deficiencies.

When a deficiency is identified by the Permittees, the following process action steps are required:

- The condition is documented on a Corrective Action Report (**CAR**) by the individual identifying the problem.

- The DOE has designated the CAR Initiator and Assessment Team Leader to review the CAR, determine validity of the finding (determine that a requirement has been violated), classify the significance of the condition, assign a response due date, and issue the CAR to the responsible party.

- The responsible organization reviews the CAR, evaluates the extent and cause of the deficiency and provides a response to DOE, indicating remedial actions and actions to preclude recurrence that will be taken.

- The DOE reviews the response from the responsible organization and, if acceptable, communicates the acceptance to the responsible organization.

- The responsible organization completes remedial actions and actions to preclude recurrence of the condition.

- After the corrective actions have been completed, DOE schedules and performs a verification to ensure that corrective actions have been completed and are effective. When the corrective actions have been completed and verified as being

effective, the CAR is closed by the CAR Initiator and Assessment Team Leader on behalf of DOE.

- As part of the planning process for subsequent audits and surveillances, past deficiencies are reviewed and the previous deficient activity or process is subject to reassessment.

C3-8 Special Training Requirements and Certifications

Before performing activities that affect WAP quality, personnel are required to receive indoctrination into the applicable scope, purpose, and objectives of the WAP and the specific QAOs of the assigned task. Personnel assigned to perform activities for the WAP shall have the education, experience, and training applicable to the functions associated with the work. Evidence of personnel proficiency and demonstration of competence in the task(s) assigned must be demonstrated and documented. Personnel designated to work on specific aspects of the WAP shall maintain qualification (i.e., training and certification) throughout the duration of the work as specified in this WAP and applicable QAPjPs/procedures. Job performance shall be evaluated and documented at periodic intervals, as specified in the implementing procedures.

Personnel involved in WAP activities shall receive continuing training to ensure that job proficiency is maintained. If not specified by this WAP, the due date for required continuing training courses and requalification shall be the end of the month of the anniversary date when the training was previously completed. Training includes both education in principles and enhancement of skills. Each participating site shall include in its QAPjP a description of the procedures for implementing personnel qualification and training. Training records that specify the scope of the training, the date of completion, and documentation of job proficiency shall be maintained as QA Records in the site project file.

The minimum qualifications for certain specified positions for the WAP are summarized in Table C3-2. QAPjPs, or their implementing SOPs, shall specify the site-specific titles and minimum training and qualification requirements for personnel performing WAP activities. QAPjPs/procedures shall also contain the requirements for maintaining records of the qualification, training, and demonstrations of proficiency by these personnel.

An evaluation of personnel qualifications shall include comparing and evaluating the requirements specified in the job/position description and the skills, training, and experience included in the current resume of the person. This evaluation also must be performed for personnel who change positions because of a transfer or promotion as well as personnel assigned to short-term or temporary work assignments that may affect the quality of the WAP. QAPjPs/procedures shall identify the responsible person(s) for ensuring that personnel maintain proficiency in the work performed and identify any additional training that may be required.

C3-9 Changes to WAP-Related Plans or Procedures

Controlled changes to WAP-related plans or procedures shall be managed through the document control process described in the QAPD. The Site Project Manager shall review the non-administrative changes and evaluate whether those changes could impact DQOs specified in the Permit. After site certification, any changes to WAP-related plans or procedures that could positively or negatively impact DQOs (i.e., those changes that require prior approval of the DOE as defined in Attachment C5, Section C5-2) shall be reported to the DOE within five days of

identification by the project level review. The Permittees shall send the NMED a monthly summary briefly describing the changes to data-quality affecting plans and procedures identified pursuant to this section during the previous month. If changes to data-quality affecting plans and procedures are not identified in a given month, a report is not required.

C3-10 List of References

DOE, 2019. Waste Data System User's Manual. DOE/WIPP 09-3427, Current Revision, Carlsbad, New Mexico, Carlsbad Area Office, U.S. Department of Energy.

TABLES

Table C3-1
Waste Material Parameters and Descriptions

Waste Material Parameter	Description
Iron-based Metals/Alloys	Iron and steel alloys in the waste; does not include the waste container materials
Aluminum-based Metals/Alloys	Aluminum or aluminum-based alloys in the waste materials
Other Metals	Other metals found in the waste materials
Other Inorganic Materials	Nonmetallic inorganic waste including concrete, glass, firebrick, ceramics, sand, and inorganic sorbents
Cellulosics	Materials generally derived from high-polymer plant carbohydrates; (e.g., paper, cardboard, wood, and cloth)
Rubber	Natural or man-made elastic latex materials; (e.g., surgeons' gloves, and leaded rubber gloves)
Plastics (waste materials)	Generally man-made materials, often derived from petroleum feedstock; (e.g., polyethylene and polyvinylchloride)
Organic Matrix	Cemented organic resins, solidified organic liquids and sludges
Inorganic Matrix	Any homogeneous materials consisting of sludge or aqueous-based liquids that are solidified with cement, calcium silicate, or other solidification agents; (e.g., wastewater treatment sludge, cemented aqueous liquids, and inorganic particulates)
Soils/gravel	Generally consists of naturally occurring soils that have been contaminated with inorganic waste materials
Steel (packaging materials)	55-gallon (208-Liter) drums
Plastics (packaging materials)	90-millimeter polyethylene drum liner and plastic bags

Table C3-2
Minimum Training and Qualifications Requirements

Personnel	Requirements
Radiography Operators [a]	Site-specific training based on waste matrix codes and waste material parameters; requalification every 2 years

[a] Operators are those persons responsible for the actual operation of testing equipment. QAPjPs shall include the site-specific title for this position.

Table C3-3
Testing Batch Data Report Contents

Required Information	Radiography	Visual Examination	Comment
Batch Data Report Date	X	X	
Batch number	X	X	
Waste container number	X	X	
Waste stream name and/or number	O	O	
Waste Matrix Code	X	X	Summary Category Group included in waste matrix code
Implementing procedure (specific version used)	X	X	If procedure cited contains more than one method, the method used must also be cited. Can use revision number, date, or other means to track specific version used.
Container type	O	O	Drums, Standard Waste Box, Ten Drum Overpack, etc.
Video media reference	X	X	Reference to Video media applicable to each container. For visual examination of newly generated waste, video media not required if two trained operators review the contents of the waste container to ensure correct reporting.
Imaging check	O		
Camera check		O	
Audio check	O	O	
QC documentation	X	X	
Verification that the physical form matches the waste stream description and Waste Matrix Code.	X	X	Summary Category Group included in waste matrix code
Comments	X	X	
Reference to or copy of associated NCRs, if any	X	X	Copies of associated NCRs must be available.
Verify absence of prohibited items	X	X	
Operator signature and date of test	X	X	Signatures of both operators required for Visual Verification of AK
Data review checklists	X	X	Data review checklists will be identified

LEGEND:

X - Required in batch data report.

O - Information must be documented and traceable; inclusion in batch data report is optional.