

ATTACHMENT C3

**QUALITY ASSURANCE OBJECTIVES AND DATA VALIDATION
TECHNIQUES FOR WASTE CHARACTERIZATION METHODS**

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QUALITY ASSURANCE OBJECTIVES AND DATA VALIDATION TECHNIQUES FOR WASTE CHARACTERIZATION METHODS

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

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

5 C3-2a Radiography

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

10 Precision

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

17 Accuracy

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

22 Completeness

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

27 Comparability

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

30 C3-2b Visual Examination

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

33 Precision

34 Precision is maintained by reconciling any discrepancies between the operator and the
35 independent technical reviewer with regard to identification of waste matrix code, liquids in
36 excess of TSDF-WAC limits, and compressed gases.

1 Accuracy

2 Accuracy is maintained by requiring operators to pass a comprehensive examination and
3 demonstrate satisfactory performance in the presence of the VE expert during their initial
4 qualification. Visual examination operators shall be requalified every two years.

5 Completeness

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

7 Comparability

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

10 C3-3 Acceptable Knowledge

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

- 15 • Precision - The qualitative determinations, such as compiling and assessing AK, do
16 not lend themselves to statistical evaluations of precision. However, the AK will be
17 addressed by independent reviews during internal and external audits.
- 18 • Accuracy - The percentage of waste containers which require reassignment to a
19 new waste matrix code and/or designation of different U.S. Environmental
20 Protection Agency (**EPA**) hazardous waste numbers based on testing data and
21 discrepancies identified by the Permittees during waste confirmation will be
22 reported as a measure of AK accuracy.
- 23 • Completeness - The AK record must contain 100 percent of the required
24 information (Permit Attachment C4, Section C4-3). The usability of the AK
25 information will be assessed for completeness during audits.
- 26 • Comparability - Comparability is ensured through sites meeting the training
27 requirements and complying with the minimum standards outlined for procedures
28 that are used to implement the AK process. All sites must assign hazardous waste
29 numbers in accordance with Permit Attachment C4-3b and provide this information
30 regarding its waste to other sites who store or generate a similar waste stream.
- 31 • Representativeness - Representativeness is a qualitative parameter that will be
32 satisfied by ensuring that the process of obtaining, evaluating, and documenting
33 AK information is performed in accordance with the minimum standards
34 established in Permit Attachment C4, Section C4-3. Sites also must assess and
35 document the limitations of the AK information used to assign EPA hazardous
36 waste numbers (e.g., purpose and scope of information, date of publication, type
37 and extent to which waste parameters are addressed).

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

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

10 C3-4 Data Review, Validation, and Verification Requirements

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

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

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

26 C3-4a Data Generation Level

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

- 29 • Raw data shall be signed and dated in reproducible ink by the person generating it.
30 Alternately, unalterable electronic signatures may be used.
- 31 • Data must be recorded clearly, legibly, and accurately in field records.
- 32 • Changes to original data must be lined out, initialed, and dated by the individual
33 making the change. A justification for changing the original data may also be
34 included. Original data must not be obliterated or otherwise disfigured; original data
35 must be readable. Data changes shall only be made by the individual who
36 originally collected the data or an individual authorized to change the data.
- 37 • Data must be transferred and reduced from field records completely and
38 accurately.

- 1 • Field records must be maintained as specified in Permit Attachment C, Table C-2.
- 2 • Data must be organized into a standard format for reporting purposes (BDR), as
- 3 outlined in specific testing procedures.
- 4 • Electronic and video data must be stored appropriately to ensure that waste
- 5 container and associated quality control (QC) data are readily retrievable. In the
- 6 case of classified information, additional security provisions may apply that could
- 7 restrict retrievability. The additional security provisions will be documented in
- 8 generator/storage site procedures as outlined in the QAPjP in accordance with
- 9 prevailing classified information security standards.

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

15 C3-4a(1) Independent Technical Review

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

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

- 29 • Data generation and reduction were conducted in a technically correct manner in
- 30 accordance with the methods used (procedure with revision). Data were reported
- 31 in the proper units and correct number of significant figures.
- 32 • Calculations have been verified by a valid calculation program, a spot check of
- 33 verified calculation programs, and/or 100 percent check of hand calculations.
- 34 Values that are not verifiable to within rounding or significant difference
- 35 discrepancies must be rectified prior to completion of independent technical review.
- 36 • The data have been reviewed for transcription errors.
- 37 • The testing data QA documentation for BDRs is complete and includes, as
- 38 applicable, raw data, calculation records, calibration records (or references to an
- 39 available calibration package). Corrective action will be taken to ensure that BDRs

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

- 3 • Radiography tapes have been reviewed (independent observation) on a waste
4 container basis at a minimum of once per testing batch or once per day of
5 operation, whichever is less frequent (Attachment C1, Section C1-1). The
6 radiography tape will be reviewed against the data reported on the radiography
7 form to ensure that the data are correct and complete.
- 8 • QAOs have been met according to the methods outlined in Sections C3-2 and
9 C3-3.

10 C3-4b Project Level

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

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

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

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

- 28 • Testing batch QC checks (e.g., replicate scans, measurement system checks)
29 were properly performed. Radiography data are complete and acceptable based
30 on evidence of videotape review of one waste container per day or once per testing
31 batch, whichever is less frequent, as specified in Permit Attachment C1, Section
32 C1-1.
- 33 • Data generation level independent technical review, validation, and verification
34 have been performed as evidenced by the completed review checklists and
35 appropriate signature releases.
- 36 • Independent technical reviewers were not involved in the generation or recording
37 of the data under review.
- 38 • Batch data review checklists are complete.

- 1 • Batch Data Reports are complete and data are properly reported (e.g., data are
- 2 reported in the correct units, and with the correct number of significant figures).

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

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

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

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

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

22 C3-4c Permittee Level

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

- 27 • Project-level signature releases

- 28 • Listing of the waste containers being presented in the report

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

- 31 • Site Project Manager Summary

- 32 • Data Validation Summary

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

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

3 C3-5 Reconciliation with Data Quality Objectives

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

9 C3-5a Reconciliation at the Project Level

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

- 16 • Waste matrix code
- 17 • Waste material parameter weights
- 18 • If each waste container of waste contains transuranic (**TRU**) radioactive waste
- 19 • Whether the waste stream exhibits a toxicity characteristic (**TC**) under 20.4.1.200
20 New Mexico Administrative Code (**NMAC**) (incorporating Title 40 of the Code of
21 Federal Regulations (**CFR**) Part 261, Subpart C)
- 22 • Whether the waste stream contains listed waste found in 20.4.1.200 NMAC
23 (incorporating 40 CFR Part 261, Subpart D)
- 24 • Whether the waste stream can be classified as hazardous or nonhazardous
- 25 • Whether the overall completeness, comparability, and representativeness QAOs
26 were met for each of the testing procedures as specified in Sections C3-2 and C3-
27 3 prior to submittal of a WSPF for a waste stream or waste stream lot.

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

1 C3-5b Reconciliation at the Permittee Level

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

7 C3-6 Data Reporting Requirements

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

11 C3-6a Data Generation Level

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

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

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

25 C3-6b Project Level

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

31 Summarized testing data are included in the CIS. The contents of the WSPF, CIS, and Waste
32 Stream Characterization Package are discussed in the following sections.

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

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

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

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

- 3 • Generator/storage site name
- 4 • Generator/storage site EPA ID
- 5 • Date of audit report approval by NMED (if obtained)
- 6 • Original generator of waste stream
- 7 • Whether waste is contact-handled or remote-handled
- 8 • The Waste Stream WIPP Identification Number
- 9 • Summary Category Group
- 10 • Waste Matrix Code Group
- 11 • Waste Material Parameter Weight Estimates per unit of waste
- 12 • Waste stream name
- 13 • A description of the waste stream
- 14 • Applicable EPA hazardous waste numbers
- 15 • Applicable TRUCON codes
- 16 • A listing of AK documentation used to identify the waste stream
- 17 • The waste characterization procedures used and the revision number and date of
- 18 the procedure
- 19 • Certification signature of Site Project Manager, name, title, and date signed

20 C3-6b(2) Characterization Information Summary

21 The CIS shall include the following elements, if applicable:

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

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

- 3 • Complete AK summary, including stream name and number, point of generation,
4 waste stream volume (current and projected), generation dates, TRUCON codes,
5 Summary Category Group, Waste Matrix Code(s) and Waste Matrix Code Group,
6 other TRU Waste Baseline Inventory Report information, waste stream description,
7 areas of operation, generating processes, Resource Conservation and Recovery
8 Act determinations, radionuclide information, the references used to generate the
9 AK summary, and any other information required by Permit Attachment C4,
10 Section C4-2b.

- 11 • Method for determining Waste Material Parameter Weights per unit of waste.

- 12 • List of AK Sufficiency Determinations requested for the waste stream, if applicable.

- 13 • Certification through AK or testing that any waste assigned the EPA hazardous
14 waste number of U134 (hydrofluoric acid) no longer exhibits the characteristic of
15 corrosivity. This is verified by ensuring that no liquid is present in U134 waste.

16 C3-6b(3) Waste Stream Characterization Package

17 The Waste Stream Characterization Package includes the following information:

- 18 • Waste Stream Profile Form (Section C3-6b(1))
- 19 • Accompanying CIS (Section C3-6b(2))
- 20 • Complete AK summary (Section C3-6b(2))
- 21 • Batch Data Reports supporting the characterization of the waste stream and any others
22 requested by the Permittees
- 23 • Raw testing data requested by the Permittees

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

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

29 C3-7 Nonconformances

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

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

4 Nonconformances

5 Nonconformances are uncontrolled and unapproved deviations from any applicable approved
6 plan or procedure. Nonconforming items and nonconforming activities are those that do not
7 meet the WAP requirements, procurement document criteria, or approved work procedures.
8 Nonconforming activities shall be identified and noted in applicable generator site corrective
9 action documents, such as Generator Site Technical Reviews (**GSTRs**) or comparable site-
10 specific reviews and assessments. Nonconforming items shall be identified by marking, tagging,
11 or segregating, and the affected generator/storage site(s) notified. Any waste container for
12 which a nonconformance report (**NCR**) has been written will not be shipped to the WIPP facility
13 unless the condition that led to the NCR for that container has been dispositioned in accordance
14 with DOE's Quality Assurance Program Description (**QAPD**). Disposition of nonconforming
15 items or nonconforming activities shall be identified and documented. The QAPjPs shall identify
16 the person(s) responsible for evaluating and dispositioning nonconforming items or
17 nonconforming activities and shall include referenced procedures for handling them. For each
18 container selected for confirmation pursuant to Permit Attachment C7, the Permittees will
19 examine the respective NCR documentation to verify NCRs have been dispositioned for the
20 selected container.

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

- 25 • Project staff - during field operations, supervision of subcontractors, data validation
26 and verification, and self-assessment
- 27 • Testing Facility staff - during the preparation for and performance of laboratory
28 testing; calibration of equipment; QC activities; data review, validation, and
29 verification; and self-assessment
- 30 • QA personnel - during oversight activities or audits

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

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

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

6 Nonconformance to DQOs

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

17 DOE's Corrective Action Process

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

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

- 23 • The condition is documented on a Corrective Action Report (**CAR**) by the individual
24 identifying the problem.
- 25 • The DOE has designated the CAR Initiator and Assessment Team Leader to
26 review the CAR, determine validity of the finding (determine that a requirement has
27 been violated), classify the significance of the condition, assign a response due
28 date, and issue the CAR to the responsible party.
- 29 • The responsible organization reviews the CAR, evaluates the extent and cause of
30 the deficiency and provides a response to DOE, indicating remedial actions and
31 actions to preclude recurrence that will be taken.
- 32 • The DOE reviews the response from the responsible organization and, if
33 acceptable, communicates the acceptance to the responsible organization.
- 34 • The responsible organization completes remedial actions and actions to preclude
35 recurrence of the condition.
- 36 • After the corrective actions have been completed, DOE schedules and performs a
37 verification to ensure that corrective actions have been completed and are
38 effective. When the corrective actions have been completed and verified as being

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

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

6 C3-8 Special Training Requirements and Certifications

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

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

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

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

37 C3-9 Changes to WAP-Related Plans or Procedures

38 Controlled changes to WAP-related plans or procedures shall be managed through the
39 document control process described in the QAPD. The Site Project Manager shall review the
40 non-administrative changes and evaluate whether those changes could impact DQOs specified
41 in the Permit. After site certification, any changes to WAP-related plans or procedures that could
42 positively or negatively impact DQOs (i.e., those changes that require prior approval of the DOE

1 as defined in Attachment C5, Section C5-2) shall be reported to the DOE within five days of
2 identification by the project level review. The Permittees shall send the NMED a monthly
3 summary briefly describing the changes to data-quality affecting plans and procedures identified
4 pursuant to this section during the previous month. If changes to data-quality affecting plans and
5 procedures are not identified in a given month, a report is not required.

6 C3-10 List of References

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

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TABLES

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**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

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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.

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**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.

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