DOE/NV--325-24-00
Volume I: Administrative Waste Acceptance Criteria
Volume II: Technical and Regulatory Waste Acceptance Criteria

Nevada National Security Sites Waste Acceptance Criteria

Prepared for the U.S. Department of Energy
Environmental Management Nevada Program
and
National Nuclear Security Administration
Nevada Field Office

Volume I: Administrative Waste Acceptance Criteria
Volume II: Technical and Regulatory Waste Acceptance Criteria

February 2024

APPROVED FOR PUBLIC RELEASE

EDITOR'S NOTE: Certain hyperlinks featured herein may be temporarily non-functional as administrative actions are completed in tandem with implementation of the revised NNSSWAC. If a non-functional hyperlink is encountered, please contact RWAP@emnv.doe.gov to request a copy of the reference material.

February 2024

NNSSWAC Revision History

Date	Pages Changed	Revision
1978–1996		Historical note below
09/1996	All	Rev. 0
08/1997	All	Rev. 1
05/1999	All	Rev. 2
02/2000	i, vi, 3-5, Ref-1	Rev. 2, DCN DOE/NV-325-03-01
11/2000	All	Rev. 3
01/2002	All	Rev. 4
10/2003	All	Rev. 5
07/2005	3-8, 3-10, Appendix G	Rev. 5-01, DOE/NV-325-Rev 5-DCN-05-01
10/2005	All	Rev. 6
06/2006	ii, 3-1, 3-6, 3-9,3-13, 4-2, 4-5, 6-3, 6-4, B-1, E-1, E-3, G-1, H-2, Ref-4	Rev. 6-01, DOE/NV-325-Rev 6-DCN-06-01
10/2006	i, ii–viii, 1-1, 1-2, 1-3, 2-1, 2-3, 3-1, 3-4, 3-6, 3-7, 3-8, 3-9, 3-11, 3-12, 3-16, 6-1, 6-2, 6-3, 6-4, 6-5, 6-6, 6-7, B-1, C-1, C-2, C-4, D-1, D-2, D-4, E-2, E-9, G-3, H-1, Ref-3, Ref-4	Rev. 6-02, DOE/NV-325-Rev 6-DCN-06-02
06/2008	All	Rev. 7: Clarifications and edits based on NNSA/NSO, NDEP, RWAP, and Waste Generator reviews. Revisions identified by change bars.
05/2009	Incorporate new classified waste disposal requirement; remove the term “storage” for waste received at NNSS.	Rev. 7-01: Sections 1.1, 3.1.18, 3.2.8, and 3.2.10; App. D; App. H; and References
09/2010	Selected areas as stated; incorporate new Appendix B.	Rev. 8: Changed NTS to NNSS; Sections 3.1.15, 3.1.18, 3.1.19, 3.2.5, 3.2.13, 3.2.14, 3.3.1, 3.3.5.2, 3.3.6.1, 6.3.1, and 6.3.4; Appendices B, C, E, F, and H.
01/2011	Section 3.3.1	Rev. 8-01: Section 3.3.1, Revised EPA Hazardous Waste Codes; Section 6.4, added Hoover Dam Bypass Bridge.
02/2012	Sections 1.1, 1.2.1, 1.2.3, 1.2.4, 1.4, 2.1.2, 2.1.5, 2.3, 2.4, 2.5, 2.6, 3.0, 3.1.4, 3.1.7, 3.1.8, 3.1.9, 3.1.10, 3.1.14, 3.1.15, 3.1.18, 3.1.19, 3.2.2, 3.2.4, 3.2.6, 3.2.8, 3.2.13, 3.2.14, 3.3.1, 5.0, 5.9, and 6.3.4; Appendix A; Table B-1; Figure C-2; Appendix D; Glossary; and References	Rev. 9: Updated acronyms and chapter figures; added information on DOE non-radioactive classified waste, DOE non-radioactive hazardous classified waste, and DOD classified waste; updated titles of personnel to differentiate between NNSA/NSO and Contracting Organization; updated Package Shipment Disposal Request sample and instructions; other revisions identified by change bars.

NNSSWAC Revision History

Date	Pages Changed	Revision
03/2013	Sections 1.1 1.2, 1.3, 1.4, 2.1; 2.2, 2.6, 3.1, 3.2.2, 3.2.4, 3.2.6, 3.2.13, 3.3, 4.0, 5.6, 5.10, 6.1, 6.3.2, 6.3.4, 6.4, and 6.6; Appendices C, F, G, and H	Rev. 10: Added information regarding disposing/ transferring classified matter at the NNSS; updated acronyms and abbreviations; changed Waste Management Project to Environmental Management Operations; incorporated new PE-g limits; updated shipping forms for MLLW and classified non-radioactive hazardous waste/matter; updated definitions; changed NNSA/NSO to NNSA/NFO to reflect the new name of the Nevada Field Office; other revisions identified by change bars.
02/2015	Sections 3.2.2 and 6.4	Revision 10a: Revised language to be similar to the language found in Revision 9; added deviation request option.
09/2016	Document Number; Historical Note; List of Photos; Acronyms; References; and Sections 1.2.5, 1.4, 2.1.4, 3.1.2, 3.1.8, 3.1.11, 3.1.14, 3.1.15, 3.1.18, 3.2.4, 3.2.6, 3.2.13, 3.3, 3.3.1, 3.3.6, 3.3.8, 5.10, 6.2, 6.3, 6.4, 6.6, and 6.8.	Edits throughout document; key changes to DOE/NV--325-16-00 due to revised regulations and DOE directives, RCRA Permit revisions, and enhanced operational needs.
03/2022	All	Complete revision of document, creating Volume I (Administrative Waste Acceptance Criteria) and Volume II (Technical and Regulatory Waste Acceptance Criteria). *Note: 04/05/2022, document reposted to remove distribution letter, correct document number on cover pages, and include active bookmarks; 06/14/2022, document reposted to align AWAC cross references in Sections 5.2 and 6.2, pagination in Appendix E, and TWAC Table 3-10 formatting.*
02/2024	All	Updated document number. **AWAC** – Editorial/clarifying language throughout; Directions for submission of classified matter in accordance with 01/19/2023 NNSA Interim Guidance Letter (Appendix G); Updated directions for project certification (Appendix F); Adoption of SharePoint language throughout; Section 2.0, Clarification of WCO requirements, management of returned packages; Section 5.2.2, Addition of requirements for radiological data validation; Section 6.2.1, Addition of non-steel boxes to strength criteria section; Section 9.0, Updated to current DOE Order reference; Section 9.1, Added criteria for fixed contamination; Section 10.1.1, Updated consignment instructions; Section 11.0, Updated driver's responsibilities, arrival registration, protocols for obtaining certificates of disposal; New Section 13.4, Toxic Release Inventory reporting; Appendix B, Specific requirements for M&TE control. **TWAC** – Editorial/clarifying throughout; Section 3.2, Clarifying language for liquid in regulated asbestos waste; Table 3-10, Updated Pu-239 FE equivalency factor.

Nevada National Security Sites
Waste Acceptance Criteria

Volume I:
Administrative
Waste Acceptance Criteria

February 2024

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Approval Signatures

This document is correct, and the process and criteria stated within meet the U.S. Department of Energy and appropriate federal regulation requirements.

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List of Acronyms and Abbreviations

ALARA	As low as reasonably achievable
AEA	*Atomic Energy Act*
ASTM	ASTM International
AWAC	Administrative Waste Acceptance Criteria
AWCO	Alternate Waste Certification Official
BIC	Appendix B Implementation Crosswalk
Bq	Becquerel
Bq/m^3	Becquerels per cubic meter
CAC	Competent Authority Certification
CAP	Corrective action plan
CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act*
CFR	*Code of Federal Regulations*
Ci	Curie
cm	Centimeter
COC	Certificate of Compliance
DAS	Disposal Authorization Statement
DAW	Dry active waste
DC/RO	Derivative Classifier/Reviewing Official
DHS	U.S. Department of Homeland Security
DoD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOECAP	DOE Consolidated Audit Program
DOT	U.S. Department of Transportation
DP	Defense Programs
DQO	Data quality objective
DSA	Documented safety analysis
DU	Depleted uranium
DUF6	Depleted uranium hexafluoride
ECPL	Evaluated Carriers Performance List
EM	Environmental Management
EPA	U.S. Environmental Protection Agency
FE	Facility evaluation
FMCSA	Federal Motor Carrier Safety Administration
FOAV	Finding of Alleged Violation
ft	Foot
ft^3	Cubic foot

g	Gram
gal	Gallon
HAZMAT	Hazardous materials
HAZTRAK	Hazardous Materials Tracking System
HIC	High integrity container
HQ	Headquarters
HRCQ	Highway Route Controlled Quantity
HRI	Human readable interpretation
HRPP	High-risk personal property
IAEA	International Atomic Energy Agency
IP-1	Industrial Package–1
kg/m^2	Kilograms per square meter
lb	Pound
lb/ft^2	Pounds per square foot
LDR	Land disposal restriction
LLW	Low-level waste
LWIS-G	Low-Level Waste Information System-Generator
M	Manual
m	Meter
MC&A	Material Control and Accountability
MCEP	Motor Carrier Evaluation Program
mg/kg	Milligrams per kilogram
MIPR	Military Interdepartmental Purchase Request
MLLW	Mixed low-level waste
mrem/hr	Millirem per hour
mSv/hr	Millisieverts per hour
M&TE	Measuring and test equipment
MW	Mixed waste
N/A	Not applicable
nCi/g	Nanocuries per gram
NCSE	Nuclear Criticality Safety Evaluation
NDA	Nondestructive assay
NDEP	Nevada Division of Environmental Protection
NDOT	Nevada Department of Transportation
NIC	NNSSWAC Implementation Crosswalk
NMMSS	Nuclear Materials Management and Safeguards System
NNSA	National Nuclear Security Administration
NNSA/NFO	National Nuclear Security Administration Nevada Field Office

NNSS	Nevada National Security Sites
NNSSWAC	*Nevada National Security Sites Waste Acceptance Criteria*
NOV	Notice of Violation
NR	Naval Reactors
NRC	U.S. Nuclear Regulatory Commission
O	Order
OCC	Operations Command Center
ORPS	Occurrence Reporting and Processing System
OSHA	Occupational Safety and Health Administration
OT	Other
OVP	Over-Dimensional Vehicle Permits
PCB	Polychlorinated biphenyl
pCi/g	Picocuries per gram
PCL	Package certification label
PFAS	Per-and polyfluoroalkyl substance
PK	Process knowledge
POC	Point of contact
PSDR	Package Shipment Disposal Request
PTN	Pre-Treatment Notification
QA	Quality assurance
Q&A	Question and answer
QAP	Quality Assurance Program
QAPP	Quality Assurance Program Plan
RACM	Regulated asbestos-containing material
RCA	Root cause analysis
RCRA	*Resource Conservation and Recovery Act*
rem/hr	Rem per hour
R/hr	Roentgens per hour
RTR	Real-time radiography
RWAP	Radioactive Waste Acceptance Program
RWMC	Radioactive Waste Management Complex
RWMS	Radioactive Waste Management Site
RWP	Radiological Work Permit
SAP	Sampling and Analysis Plan
SAR	Safety Analysis Report
S/CI	Suspect/Counterfeit Items
SDS	Safety Data Sheet
SME	Subject matter expert

SPP	Strategic Partnership Program
SSIMS	Safeguards and Security Information Management System
STD	Standard
TBq	Terabecquerel
TID	Tamper-indicating device
TRU	Transuranic
TSDF	Treatment, storage, and disposal facility
TWAC	Technical and Regulatory Waste Acceptance Criteria
UHWM	Uniform Hazardous Waste Manifest
USDA	U.S. Department of Agriculture
WAC	Waste Acceptance Criteria
WARP	Waste Acceptance Review Panel
WCO	Waste Certification Official
WCP	Waste Certification Program
WCPjP	Waste Certification Project Plan
WCPP	Waste Certification Program Plan
WG	Waste Generator
WP	Waste Profile
°C	Degree Celsius
µCi	Microcurie
µg/L	Micrograms per liter

1.0 Purpose and Scope

This document establishes the *Nevada National Security Sites Waste Acceptance Criteria* (NNSSWAC) for the U.S. Department of Energy (DOE), National Nuclear Security Administration Nevada Field Office (NNSA/NFO) and DOE Environmental Management (EM) Nevada Program. The NNSSWAC provides the requirements, terms, and conditions under which the Nevada National Security Sites (NNSS) will accept waste. The NNSS has the following express purposes:

- Support ongoing National Nuclear Security Administration (NNSA) operations critical to national security.
- Support the DOE mission of remediating Cold War legacy sites.
- Support other DOE missions, including Office of Science, Nuclear Energy, and Nuclear Nonproliferation programs.
- Ensure long-term protection of national security interests by providing a secure, compliant, permanent outlet for classified waste for DOE/NNSA and for the U.S. Department of Defense (DoD).
- Serve the national interest through the acceptance of radioactive sources or radioactive waste (or as directed by U.S. Congress) that the U.S. Government has taken ownership of when it is in the interest of national security and public safety.

The NNSSWAC is designed to ensure that adherence to its requirements will result in waste that is compliant with applicable federal and state regulations, DOE directives, permits, and authorizations. The requirements apply equally to classified matter high-risk personal property (HRPP) shipped and accepted at the NNSS for permanent burial as waste in accordance with the January 19, 2023, *NNSA Classified Matter High-Risk Personal Property Management and Disposition Policy – Interim Guidance Letter* (hereafter referenced as the Classified Matter Interim Direction) unless otherwise noted.

The NNSSWAC specifies controls that promote the protection of the environment, workers, and the public from physical, chemical, and radiological hazards associated with waste transportation and disposal at the NNSS.

This NNSSWAC fulfills requirements outlined in DOE O 435.1, *Radioactive Waste Management;* the disposal authorization statement (DAS); the documented safety analysis (DSA); State of Nevada hazardous waste regulations and state-issued permits; and relevant state and federal regulations. This document applies to all entities shipping waste to the NNSS Radioactive Waste Management Complex (RWMC) (hereafter, "RWMC" references both the Area 5 RWMC and Area 3 Radioactive Waste Management Site [RWMS]) for disposal. Changes to DOE directives and the other listed requirement sources will be reviewed and, as necessary, addenda or interim direction will be issued in accordance with Section 1.1.1 and incorporated into subsequent revisions.

A depiction of the NNSS program structure with organizational interaction and key regulatory drivers is included as Figures 1-1 and 1-2, respectively.

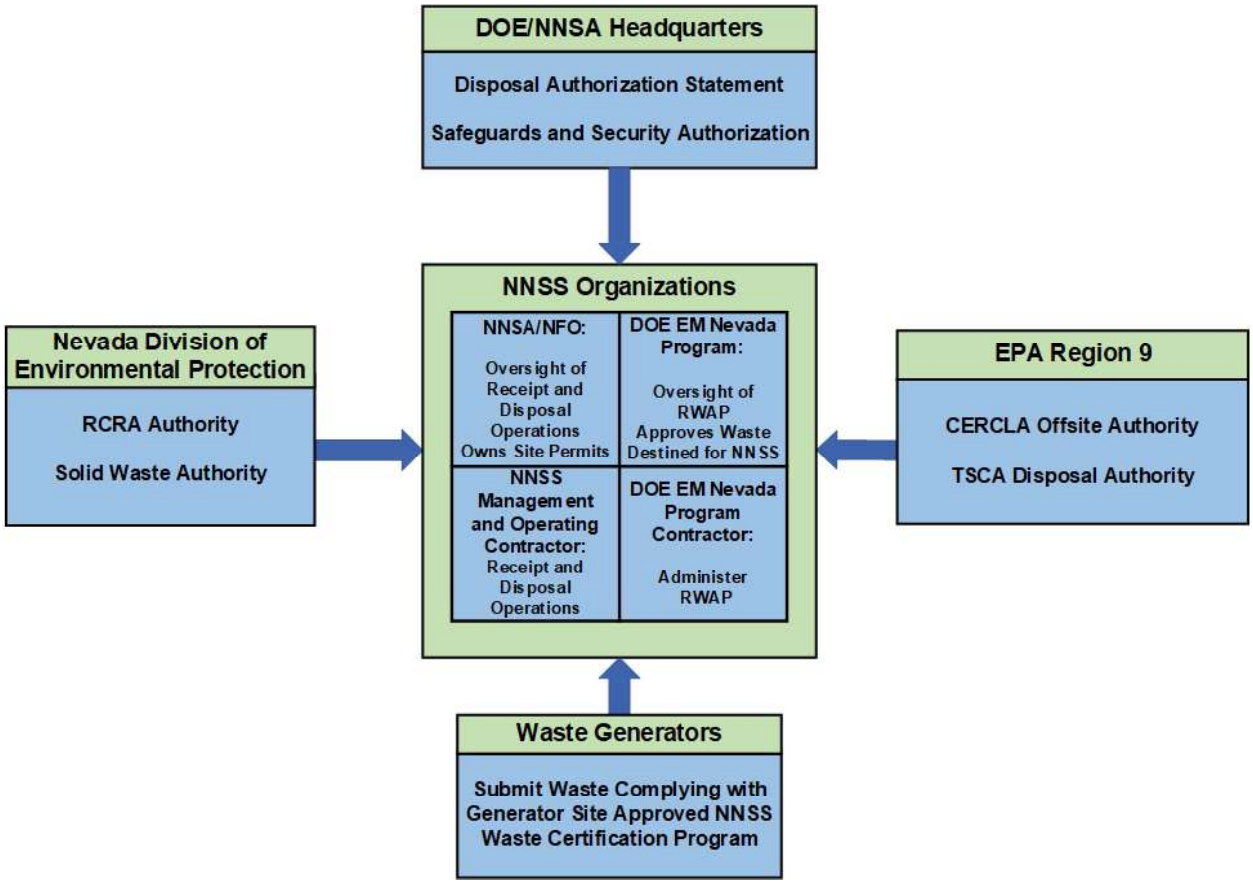

Figure 1-1
Organizational Interactions

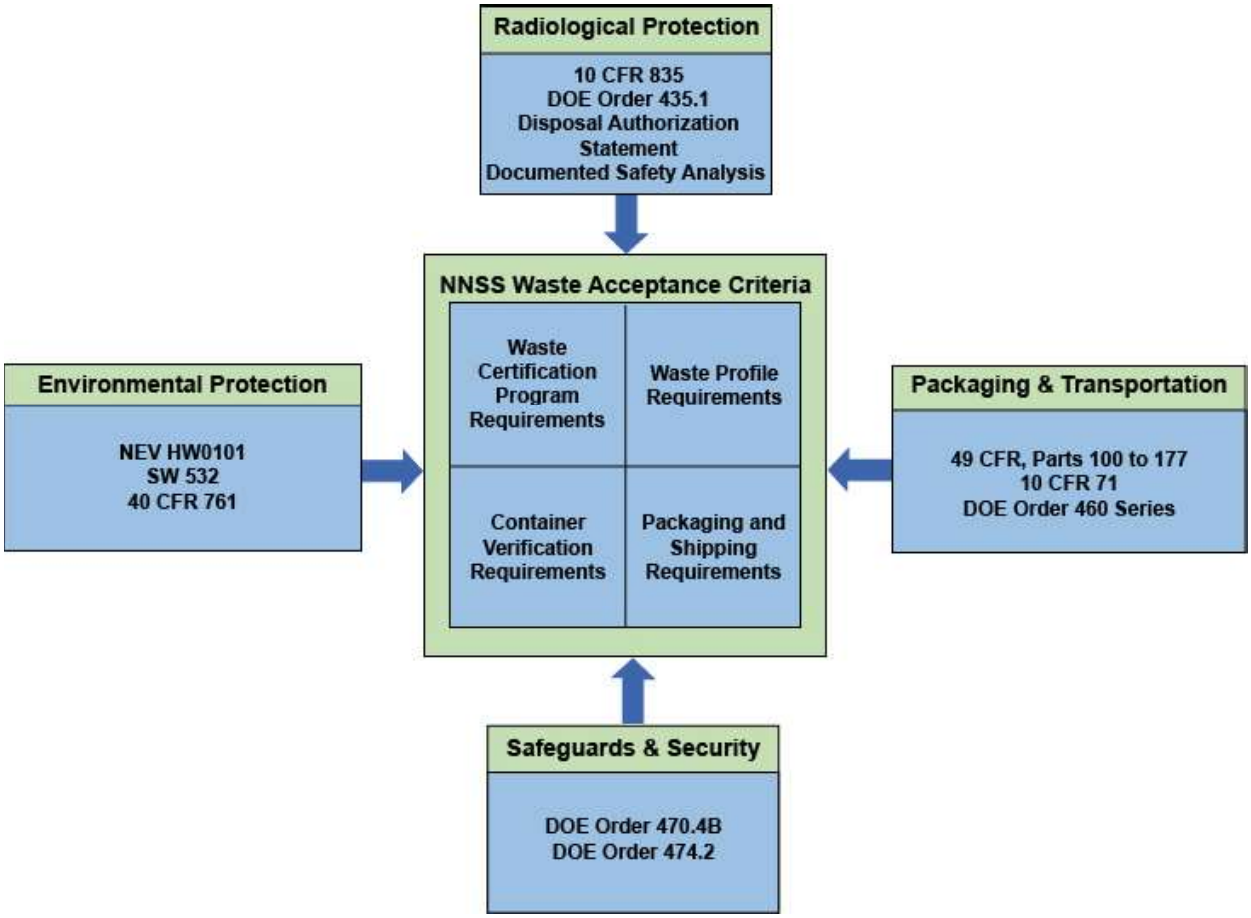

Figure 1-2
Key Regulatory Drivers

1.1 NNSSWAC Overview

The NNSSWAC is divided into two (2) volumes: the Administrative Waste Acceptance Criteria (AWAC), and the Technical and Regulatory Waste Acceptance Criteria (TWAC). The AWAC specifies administrative processes and is designed to be revised to reflect NNSS operational changes. The TWAC identifies waste form requirements derived from regulations and governing site documents. Revisions to the TWAC are contingent upon changes to the performance assessment, the DSA, state-issued permits, or pertinent regulations. Waste Generators (WGs) *shall* comply with requirements contained in both the AWAC and TWAC.

AWAC and TWAC requirements directly related to the Waste Certification Program (WCP) are identified by the inclusion of the term "*shall*." Non-bolded *shall* statements derive from NNSS

operating procedures or state agreements. Bolded ***shall*** statements are derived from federal or state regulations, permits, the DAS, or the DSA. Source documentation for references will be maintained on the Radioactive Waste Acceptance Program (RWAP) SharePoint site (hereafter, "SharePoint"). Current contact information for NNSS personnel with responsibilities defined in the NNSSWAC are listed in Appendix A and will also be maintained on SharePoint. Alerts will be sent to WGs when references or contact information updates are made on SharePoint.

The appendices include a listing of forms referenced in the NNSSWAC. Current versions of forms are available from SharePoint. Alerts will be sent to WGs when forms are updated on SharePoint. Unless otherwise noted, submissions are to be made through SharePoint. This includes waste profiles that do not contain classified information. WPs are entered directly into the eProfile application. Programs or projects without access to SharePoint may request forms or make submissions via email to RWAP@emnv.doe.gov. Electronic signatures through Entrust or other encryption software are accepted. New generators should contact the SharePoint Administrator for RWAP, as identified in Appendix A, to obtain access to SharePoint.

NO CLASSIFIED INFORMATION IS TO BE UPLOADED VIA SHAREPOINT. THE WG *SHALL* NOTIFY THE RWAP MANAGER TO COORDINATE SUBMISSIONS OF CLASSIFIED NNSS DOCUMENTS (E.G., PRE-TREATMENT NOTIFICATIONS [PTNs], WASTE PROFILES [WPs]).

1.1.1 Changes to the NNSSWAC

The NNSA/NFO Manager, in conjunction with the DOE EM Nevada Program Manager, may issue revisions, addenda, and interpretations to the NNSSWAC. Addenda, interim direction, and interpretations are considered NNSSWAC requirements and will be formally issued with a required implementation date. Failure to adhere to an addendum, interim direction, or interpretation after the required implementation date may result in a finding.

1.1.1.1 Addenda and Interim Direction

Addenda and/or interim direction are issued to the DOE/NNSA site office or senior facility management for non-DOE/NNSA sites by formal letter. Addenda enact new requirements, and

interim direction enact changes to existing requirements without issuing formal revisions. Addenda/interim direction will be incorporated in future NNSSWAC revisions.

1.1.1.2 Interpretations

Interpretations are issued to DOE/NNSA site offices or senior facility management for non-DOE/NNSA sites by formal letter. Interpretations clarify existing NNSSWAC requirements without issuing formal revisions. Interpretations will be incorporated in future NNSSWAC revisions.

1.1.1.3 Guidance

Guidance is issued by the RWAP Manager via email to WGs. Guidance includes responses to questions, best practices, lessons learned, and other clarifying information regarding NNSSWAC requirements. Unlike addenda, interim directions, or interpretations, WGs are not required to comply with guidance. Guidance is posted in the Question and Answer (Q&A) Log on SharePoint.

1.1.1.4 Alerts

Alerts are issued by the RWAP Manager or the RWMC Waste Operations Supervisor via email to WGs. Alerts are provided for immediate awareness and action regarding updates to forms (see Appendix D), computer systems (e.g., Low-Level Waste Information System-Generator [LWIS-G], SharePoint, and the Hazardous Materials Tracking System [HAZTRAK]) and arising conditions, but do not require program changes. Alerts are also posted on SharePoint.

1.2 NNSS Eligibility

The following classified and non-classified wastes are eligible for disposal at the NNSS: (1) low-level waste (LLW); (2) mixed low-level waste (MLLW); and (3) non-radioactive classified waste, both hazardous and non-hazardous.

1.2.1 DOE/NNSA Waste

Waste without a clear and unambiguous nexus to DOE/NNSA will be verified by NNSA in consultation with DOE to be eligible for disposal. Federal personnel responsible for waste generated at sites not under current DOE management may contact the DOE EM Nevada Deputy Program Manager, Operations for guidance on determining eligibility for disposal at the NNSS.

Sources originated from non-DOE/NNSA facilities managed by DOE/NNSA-funded operations are eligible for disposal at the NNSS.

Waste transferred from a DOE/NNSA site to a commercial treatment, storage, and disposal facility (TSDF) for storage, sorting, treatment, and/or sanitization is eligible for disposal at the NNSS provided that the waste is traceable to the originating DOE/NNSA site.

1.2.2 DoD Waste

Classified DoD waste (radioactive or non-radioactive) is authorized for disposal at the NNSS. Non-classified radioactive waste originating from DoD operations is eligible for disposal at the NNSS if a positive eligibility determination is made.

1.3 NNSSWAC Roles and Responsibilities

The following subsections describe the organizational roles and responsibilities for selected NNSSWAC positions. Additional personnel and contact details are identified in Appendix A and on SharePoint.

1.3.1 Federal Personnel

1.3.1.1 NNSA/NFO Manager

The NNSA/NFO Manager is the Field Element Manager for ensuring that safety, security, maintenance, and nuclear safety programs for radioactive waste management activities at the RWMC are conducted by the site contractor in accordance with all applicable state and federal regulations, DOE directives, and state-issued permits and authorizations. The NNSA/NFO Manager is responsible for coordination with the DOE EM Nevada Program Manager to ensure

operational alignment with the NNSSWAC. This includes engaging and obtaining DOE EM Nevada Program concurrence on operational changes, permit modifications, and/or interpretations that impact the NNSSWAC and coordinating on communications elevated to DOE/NNSA Headquarters (HQ).

1.3.1.2 DOE EM Nevada Program Manager

The DOE EM Nevada Program Manager is responsible for ensuring that programs are established and funded to execute the RWAP and associated radioactive waste management activities at the RWMC in accordance with applicable state and federal regulations, DOE directives, and state-issued permits and authorizations. This includes managing RWAP in evaluating independent oversight of generator compliance with the NNSSWAC; administrating independent waste verification; and maintaining the NNSSWAC. The DOE EM Nevada Program Manager is responsible for issuing addenda, interim directions, revisions, and/or interpretations to the NNSSWAC in conjunction with NNSA/NFO. In addition, the DOE EM Nevada Program Manager coordinates with the NNSA/NFO Manager to ensure operational alignment on radioactive waste disposal activities and coordinating on communications elevated to DOE/NNSA HQ.

1.3.1.3 DOE EM Nevada Deputy Program Manager, Operations

The DOE EM Nevada Deputy Program Manager, Operations is responsible for oversight of RWAP scope, schedule, execution, and budget. The DOE EM Nevada Deputy Program Manager, Operations is the primary point of contact (POC) for initiating and receiving federal correspondence and notifications on behalf of the NNSS regarding WCPs, WPs, and waste shipments to the RWMC. NNSSWAC actions assigned to the DOE EM Nevada Deputy Program Manager, Operations may be executed by their designee.

1.3.1.4 Local DOE/NNSA Site Federal Personnel and DoD Federal Personnel

Federal personnel at each local DOE/NNSA waste generating site are responsible for ensuring that work planning includes the waste to be generated and that commensurate funding is available to ensure waste destined for the NNSS is certified to the requirements of this NNSSWAC. For new programs and programs that have been suspended, the local

DOE/NNSA office is responsible for declaring contractor readiness prior to requesting an RWAP assessment.

The local DOE/NNSA site office is required to identify a site representative as the primary contact for NNSS federal personnel regarding WCP and WP submissions. The local DOE/NNSA site representative is responsible for responding to requests from the DOE EM Nevada Deputy Program Manager, Operations or from other NNSS federal personnel. The local DOE/NNSA site office representative is responsible for ensuring that the contractor's Waste Certification Official (WCO) has a mechanism for reporting safety, quality, and/or compliance issues.

DOE/NNSA federal personnel overseeing projects conducted at a facility other than a DOE or NNSA site but shipping waste for disposal at the NNSS are responsible for adhering to the requirements specified in this section. DoD personnel overseeing the shipment of waste for disposal at the NNSS are also responsible for adhering to the requirements specified in this section.

1.3.2 NNSS Contractors

1.3.2.1 DOE EM Nevada Program Contractor – RWAP Manager

The RWAP Manager is responsible for maintaining the program for evaluating WCPs, administering WP reviews, chairing the Waste Acceptance Review Panel (WARP), conducting waste verifications, and reporting on these activities to the DOE EM Nevada Deputy Program Manager, Operations. The RWAP Manager's office serves as the primary POC for WCO NNSSWAC inquiries, facility evaluations (FEs), verifications, and WP submissions.

1.3.2.2 NNSA/NFO Contractor – RWMC Waste Operations Supervisor

The RWMC Waste Operations Supervisor oversees the scheduling, receipt, handling, and compliant placement of waste. The RWMC Waste Operations Supervisor coordinates information requests regarding discrepancies involving packages or shipments received at the RWMC and responds to non-emergency questions arising during transit. The RWMC Waste Operations Supervisor serves as the primary POC for RWMC shipment scheduling and logistics.

The RWMC Waste Operations Supervisor has delegated specific operational and reporting functions as noted in this NNSSWAC.

1.3.2.3 NNSA/NFO Contractor – Operations Command Center

The Operations Command Center (OCC) receives initial notifications regarding in-transit waste shipment incidents or delays. The OCC relays notifications to cognizant NNSA/NFO and DOE EM Nevada Program federal and contractor personnel for action.

1.3.3 Generators Submitting Waste to the NNSS

1.3.3.1 Site Contractors

Site contractors are those executing work on sites owned and operated by DOE/NNSA and other government-contracted fixed facilities with an ongoing mission. When submitting waste to the NNSS, these site contractors are responsible for establishing a WCP aligned with NNSSWAC requirements with a designated WCO. Site contractors are expected to support the WCO and wider staff personnel in self-identifying and reporting issues proactively, and to participate in sharing lessons learned across the complex.

The site contractor is responsible for submitting requested documentation relative to site programs, including forecasting, and/or specific wastes and for ensuring necessary facility access for RWAP and observers to complete FEs and waste verifications. When site contractors use their WCPs to certify waste at remote facilities, they *shall* follow the requirements in Appendix F.

1.3.3.2 Commercial TSDFs

Commercial TSDFs have the same responsibilities identified in Section 1.3.3.1. Commercial TSDFs *shall* identify the senior facility manager with authority over budget and schedule.

The TSDFs *shall* also adhere to these additional requirements:

- Participating in the DOE Consolidated Audit Program (DOECAP).

- Notifying the RWAP Manager of waste to be disposed at the NNSS prior to acceptance for treatment through the Pre-Treatment Notification (PTN) or other agreed means.

When commercial TSDFs use their WCP to certify waste at remote facilities, they *shall* follow the requirements in Appendix F.

1.3.3.3 Other Non-DOE/NNSA Facilities

Other facilities that establish a DOE/NNSA nexus that produce waste for disposal at the NNSS have the same responsibilities as in Section 1.3.3.1.

1.3.3.4 Project Contractors

Project contractors are responsible for fixed work scopes with defined waste types and volumes. Projects have scheduled completion dates and are conducted at sites that do not have an established WCP. Instructions for project waste shipment approval are available on SharePoint or via request from the RWAP Manager. In lieu of the requirements in Sections 2.0 and 3.0, project contractors are required to follow the requirements in Appendix F. Unless otherwise specified in the instructions, requirements in Sections 4.0 through 15.0 of this AWAC and requirements in the TWAC apply to project waste shipped to the NNSS.

1.4 Fines/Penalties

Fines and penalties incurred by the NNSS for the failure of the WG to adhere to the requirements of this NNSSWAC will be referred to DOE/NNSA HQ, as appropriate.

2.0 NNSS Waste Certification Program

The NNSSWAC is based on the premise that generators have well-established, documented work control systems for the execution of work processes, including waste management. Work control systems *shall* include training (initial and continuing) for personnel generating waste commensurate with their responsibilities to ensure awareness of proper handling protocols (e.g., identification of prohibited items, appropriate disposal receptacles) and whom to contact for evaluating new waste(s). The WG *shall* ensure that the WCO and Alternate Waste Certification Official (AWCO) (if applicable) are trained to the requirements of the AWAC and TWAC prior to assuming WCO certification duties.

WGs *shall* document, maintain, and implement a WCP in compliance with the AWAC and TWAC; and with DOE O 435.1, *Radioactive Waste Management,* and associated directives. The WCP may stand alone or may be incorporated into the site or project Quality Assurance Program (QAP). The controlling documentation (e.g., plans, procedures, work instructions, operator aids) that make up the WCP may reference the AWAC or TWAC for specific NNSS criteria. The WG *shall* maintain an organization chart that specifically depicts key WCP functions (e.g., characterization, certification, packaging, transportation) and support organizations including, but not limited to, procurement, training, and contracts.

The WG's QAP ***shall*** comply with DOE O 414.1D, *Quality Assurance*; or 10 *Code of Federal Regulations* (CFR) 830.122, "Quality Assurance Criteria." Detailed quality assurance (QA) requirements *shall* be addressed in the WG's Quality Assurance Program Plan (QAPP) or WCP-specific Waste Certification Program Plan (WCPP). The WG's QAP *shall* comply with criteria detailed in Appendix B, and generator documents *shall* be identified in the Appendix B Implementation Crosswalk (BIC). The WG *shall* provide a current copy of the QAPP or WCPP to the RWAP Manager via SharePoint.

The WCPP *shall* identify site programs that provide necessary elements (e.g., training, document control, records retention and storage). The WCPP *shall* address task-specific or specialty training requirements and qualifications for waste management functions (e.g., training to interpret radiographs, signing transportation documentation), including when services are

contracted out. The WG *shall* submit the QAPP and/or WCPP to the RWAP Manager when requesting initial program approval and when it is revised.

2.1 WCO Empowerment and Responsibilities

The WCO is considered NNSS's primary WG POC. The WG *shall* empower the WCO to execute their responsibilities without pressure regarding schedule or budget and be independent of waste generating operations. The WG *shall* empower the WCO to interface with the local DOE/NNSA site office for NNSSWAC compliance issues that cannot be resolved through the WG's management chain. For sites without a local DOE/NNSA site office, the WCO *shall* be empowered by senior facility management to contact the DOE EM Nevada Deputy Program Manager, Operations or the RWAP Manager directly for NNSSWAC compliance issues.

The WG *shall* maintain written procedures directing the work elements of the WCO. The WCO *shall* execute or delegate the specific responsibilities detailed in the following subsections. The AWCO and package certifier(s) *shall* report to the WCO when undertaking certification duties.

2.1.1 WCO Review and Concurrence of Controlling Documentation

The WCO *shall* document their participation in the review and concurrence of controlling documentation (including revisions) critical to waste certification activities (e.g., generation, packaging, inspection, characterization, certification) and procurements pertaining to NNSS-bound waste.

2.1.2 NNSSWAC Implementation Crosswalk

The WCO *shall* ensure that an NNSSWAC Implementation Crosswalk (NIC)—identifying NNSSWAC requirements, inclusive of Appendix B requirements, and the WG's WCP implementing procedures, processes, and/or methods—is available and accurate. The WCO *shall* conduct and document an annual NIC review and revise as necessary. If the annual review indicates no changes are necessary, the WCO *shall* acknowledge that no changes are necessary. The WCO *shall* submit the initial NIC and annual review documentation via SharePoint.

Unless specified otherwise by DOE EM Nevada Program, within 90 days of an NNSSWAC revision, interim guidance, interpretation, or addendum, the WCO *shall* submit a revised NIC or a record of review indicating no revisions via SharePoint.

2.1.3 Certifying WPs

The WCO *shall* certify each WP submitted is an accurate and current representation of the waste. The WCO *shall* engage with onsite WGs to ensure process parameters such as materials of construction, system inputs, operational conditions, waste forms, and contaminant loading have been considered and evaluated. For multi-generator waste streams such as dry active waste (DAW), the WCO *shall* develop a protocol for evaluating waste characterization data for inclusion in the WP (e.g., largest generators, highest activity areas, past performance).

Annual recertification requirements are discussed in Section 4.3.

2.1.4 Package Certification

Each package *shall* be certified prior to shipment. Each package certification *shall* be completed by the WCO, the AWCO(s), or a delegated package certifier based on WG controls that ensure the waste traceability.

At a minimum, the package certifier *shall* confirm the following:

- The waste and the packaging are as described on the WP.
- No prohibited wastes as defined in the TWAC are present.
- Restricted wastes as defined in the TWAC meet the requirements as specified in the TWAC, Table 3-3.
- Packages with MLLW or classified hazardous waste meet permit requirements as specified in the TWAC.
- Packages with regulated asbestos-containing material (RACM) meet permit requirements as specified in the TWAC.
- The package is closed in accordance with manufacturer's instructions or as stated in approved procedures.

If a package is rejected and returned to the WG, packages generated from the repackaging of rejected waste (progeny) *shall* have the original rejected package number (parent) entered in parentheses in the comment section on the Package Shipment Disposal Request (PSDR). Instructions for completing the PSDR can be found on SharePoint.

The package certifier *shall* sign and ensure the package certification label (PCL) is affixed to the package in accordance with Section 7.5.3.1.

The WCO *shall* maintain the names of authorized package certifier(s) on SharePoint.

2.1.5 Shipment Certification

The WCO or the AWCO(s) *shall* certify that each NNSS-bound shipment complies with AWAC and TWAC requirements. The WCO *shall* document certification in accordance with Section 10.2.2.

2.1.6 Corrective Action Concurrence

The WCO *shall* document their involvement in the corrective action processes related to issues involving management of waste destined for the NNSS, including issues identified prior to certification involving procurement, analytical services, nondestructive testing, treatment, packaging, and transportation.

2.2 WG Surveillance and Assessment

The WG *shall* ensure that resources are available to complete assessments specified in the following subsections.

2.2.1 WG Surveillance

Surveillances *shall* assess the application of controlling documentation (e.g., plans, procedures, work instructions) to actual work performed and *shall* include objective evidence of compliance. Surveillances supporting the WCP *shall* focus on the following: criteria of DOE O 414.1D or 10 CFR 830.122; radiological and chemical characterization; waste traceability; and waste packaging and transportation. The WCO or the AWCO *shall* ensure that there is a documented

annual plan for surveillances that is tracked through completion. The WCO *shall* ensure subject matter experts (SMEs) completing surveillances are independent of the work being performed.

2.2.2 Management Assessment

The WG ***shall*** conduct management assessments in accordance with DOE O 414.1D or 10 CFR 830.122. The WCO *shall* document their review of management assessments that pertain to WCP elements. The WCO *shall* document their involvement in the review of any corrective actions, resulting from management assessments, pertinent to the WCP.

2.2.3 Annual Independent Assessment

The WG *shall* ensure an independent assessment of the WCP is completed annually, which is recognized to be within ten (10) to thirteen (13) months of the prior assessment. The WCO may request an extension from the RWAP Manager with an estimated date for completion. The independent assessment *shall* include a review of AWAC and TWAC requirements. The independent assessment *shall* be led by a qualified lead assessor, independent of the work performed. The WCO *shall* submit the independent assessment to the RWAP Manager via SharePoint within fourteen (14) months of the last submission.

The WG may accumulate surveillances completed within twelve (12) months of the last annual independent assessment to satisfy the independent assessment requirement. The accumulated surveillances *shall* include an assessment of each NNSSWAC WCP key area: QA, radiological characterization, chemical characterization, traceability, and packaging and transportation. Assessments performed by the state and federal U.S. Environmental Protection Agency (EPA), U.S. Nuclear Regulatory Commission (NRC), local regulators, and DOECAP may be used in the report. The surveillances *shall* be evaluated by an independent, qualified lead assessor who *shall* prepare a report identifying trends, the assessed program elements, activities, conclusions, findings, observations, and the effectiveness of the surveillance program. WG site QA personnel or other site SMEs may be used for the review of the assessments if their independence is documented in the assessment report.

WG *shall* provide supporting information as requested by RWAP.

New WGs *shall* complete an independent assessment of their WCP to NNSSWAC requirements as a part of establishing their program. Corrective action completion *shall* be verified by the WG prior to requesting an initial RWAP onsite FE. The assessment report and completed corrective actions *shall* be submitted to the local DOE/NNSA site organization or facility senior management for non-DOE/NNSA sites for submission to the DOE EM Nevada Deputy Program Manager, Operations with the request for an RWAP FE.

2.3 Program Notifications

The WCO *shall* notify the RWAP Manager of changes to key certification personnel, organizational changes impacting certification personnel reporting lines, site contractor changes, or changes to subcontractors involved in waste management. Changes to certification personnel may be made via SharePoint. Other changes *shall* be made via email to RWAP@emnv.doe.gov.

The WCO is requested to provide copies of news articles prepared by the WG site that discuss disposal shipments to the NNSS to the RWAP Manager fourteen (14) days prior to publication.

The WCO *shall* notify the RWAP Manager of any of the following upon discovery:

- Information that may result in changes to the chemical or radiological values or regulatory categorization reported for waste previously disposed at the NNSS.
- Notification of any *Price-Anderson Amendments Act* action taken by the local DOE/NNSA office for waste management activities.
- Information that indicates that the chemical or radiological characteristics documented on the NNSS WP may be incomplete or incorrect, or there is other emerging information that may impact the overall waste package contents or integrity for an active NNSS WP.
- Occurrence Reporting and Processing System (ORPS) notifications regarding waste shipped or approved for shipment to the NNSS or shipped to any other TSDF.
- Receipt of potential or final Notice of Violation (NOV) or Finding of Alleged Violation (FOAV) from a federal, state, or local authority regarding wastes shipped or approved to ship to the NNSS or shipped to any other TSDF.

- Receipt of potential or final NOVs or FOAV from a federal, state, or local authority issued against a *Resource Conservation and Recovery Act* (RCRA) storage and/or treatment permit.

- Violation of onsite disposal facility DAS.

The WG *shall* provide additional information requested by the RWAP Manager regarding the notification. Notification requirements regarding waste in transit are included in Table 12-1. Corrective actions are addressed in Section 2.1.6.

3.0 WCP Approval and Evaluation Process

The WCP initial approval and ongoing evaluation processes combine FEs and document reviews to assess program implementation. The WG *shall* provide requested information to the designated RWAP Lead.

3.1 RWAP Facility Evaluations

RWAP FEs are conducted at the direction of DOE EM Nevada Program and may be conducted as audits and/or surveillances, which include verifications. FEs may be conducted at the WG's site, remotely, or in combination. FEs will be executed by RWAP personnel and SMEs working under their technical direction. DOE EM Nevada Program, Nevada Division of Environmental Protection (NDEP) personnel, and other participants or observers may also be present. Each FE will have a designated RWAP Lead to coordinate logistics and information requests for participants and observers. The WG *shall* provide site and facility access for FE participants and observers, including access to classified areas based on clearances and need-to-know.

WGs forecasting zero shipments for an upcoming fiscal year (October 1 through September 30) but who subsequently determine a shipment is required are requested to notify the RWAP Manager a minimum of ninety (90) days in advance of the proposed shipment date, and an FE may be scheduled. A WG that has not shipped for two (2) consecutive fiscal years *shall* undergo an FE prior to resuming shipments to the NNSS unless they have been evaluated in the last fiscal year.

3.1.1 RWAP Audits

An audit is a comprehensive assessment and evaluates the five (5) program elements: QA, radiological characterization, chemical characterization, traceability, and packaging and transportation.

3.1.1.1 RWAP Audits for Approved WGs

Audits are formally scheduled a minimum of thirty (30) days in advance by the DOE EM Nevada Deputy Program Manager, Operations through correspondence to the local DOE/NNSA site representative or to the senior facility manager for non-DOE/NNSA sites.

3.1.1.2 RWAP Audits for New WGs

New WGs *shall* undergo an onsite RWAP audit as part of obtaining WCP approval. New WGs are encouraged to use an assist visit as described in Section 3.1.4 to identify potential weaknesses prior to the onsite audit.

New WGs *shall* submit a request for an RWAP onsite audit via their local DOE/NNSA site office to the DOE EM Nevada Deputy Program Manager, Operations a minimum of ninety (90) days prior to the desired audit date.

No less than forty-five (45) days in advance of the planned audit date, the WG *shall* submit a QAPP/WCPP, completed NIC, independent assessment report, and WP in accordance with Sections 2.1.2, 2.2.3, and 4.2, respectively. The onsite audit will be scheduled after the local DOE/NNSA site office submits a written notice to the DOE EM Nevada Deputy Program Manager, Operations that the contractor has established a WCP compliant with the NNSSWAC.

3.1.2 RWAP Surveillances

Surveillances evaluate specific programmatic and/or operational element implementation. They may include one or more of the following: (1) specific program element evaluation(s), (2) corrective action evaluation(s), or (3) verifications as described in Section 3.1.3.

Surveillances are scheduled directly between RWAP and the WG. There is no advance notification time requirement.

3.1.3 RWAP Verifications

In addition to WG package certification, RWAP verifications are conducted to evaluate waste streams and/or waste containers compliance with the NNSSWAC and the WP. Verifications are categorized as follows:

- Physical verifications
  - Real-time radiography (RTR)
  - Direct visual (e.g., observing content loading)
  - Other visual (e.g., video)
- Chemical verifications
  - Sampling and analysis provided by the generator
  - Sampling and analysis observed by RWAP
  - Field kits or other field tests
- Alternative methods as recommended at WARP with NDEP consultation and documented on the WP approval form

Ten (10) percent of all MLLW and classified hazardous waste containers received under each WP ***shall*** be verified through physical, chemical, or alternative methods. A.2.1 Containers requiring disposal in the Solid Waste Permitted SW 532 cell (e.g., RACM) ***shall*** be verified at a rate of ten (10) percent as received at the NNSS or as recommended at WARP with NDEP consultation and documented on the WP approval form. A.2.2 The WP approval letter and associated form will denote whether verification is required, the type of verification. and the required frequency. Verification may be conducted at either the WG's site or upon receipt at the RWMC. Verification at the RWMC is limited to RTR.

WGs *shall* submit an Onsite Verification Request for visual verifications or for analytical verification sampling (e.g., collection or observation of split samples) via SharePoint.

Requirements for specific verification techniques are described in Sections 3.1.3.1 through 3.1.3.3.

3.1.3.1 Physical Verifications

Visual verifications are the most common form of physical verification and are visual observations of waste container contents. The WG ***shall*** affix a non-lead tamper-indicating device (TID) to the verified waste package. A.2.1 The verifier will complete a label indicating the container has been visually verified and record the affixed TID number. The WG *shall* affix the label in the presence of the verifier or maintain evidence (e.g., video or photograph) showing the label(s) being affixed to the package(s) verified. The WG *shall* mark on the PSDR the presence of the verification label.

RWAP is responsible for conducting verifications. RWAP-trained local DOE/NNSA site personnel who have volunteered and have been authorized by the DOE EM Nevada Deputy Program Manager, Operations may conduct visual verifications when agreed to by the RWAP Manager. The WG *shall* coordinate with the RWAP Manager for scheduling visual verifications to be performed by local DOE/NNSA site personnel by submitting an Onsite Verification Request via SharePoint. Upon verification checklist review and resolution of any issues, the RWAP Manager will provide a signed waste verification approval to the WG upon request.

If restrictions or limitations prevent onsite physical observations, the WG *shall* provide videos, digital recordings, RTR videographs, and/or detailed photographs of waste treatment and/or waste contents for review.

3.1.3.2 Chemical Verifications

The most common chemical verification technique consists of analysis of a split sample of the waste to verify the stated WP waste type (e.g., land disposal restriction [LDR]-compliant MLLW) or to screen for key characteristics (e.g., pH, moisture via paint filter test). The WP approval letter and associated form will identify the frequency of verification, and the analytical methods and analytes to be verified. The WG *shall* physically collect samples using the same protocols as identified in the WP (e.g., grab or composite) in the verifier's presence. The WG ***shall*** affix a non-lead TID to the MLLW or classified hazardous waste package after sampling. A.2.1 The RWAP verifier will complete a label indicating the container has been sampled for verification, recording the affixed TID number. The WG *shall* affix the label in the presence of the verifier or maintain evidence (e.g., video or photograph) showing the label(s)

being affixed to the package(s) verified. The WG *shall* mark on the PSDR the presence of the verification label. If the sample is a composite, individual waste containers verification labels are not required.

The WG *shall* manage and package the split sample(s) in accordance with the WG site's procedures. The WG *shall* confirm that the laboratory identified by RWAP can accept the split sample based on the laboratory's permits and radiological license. The WG *shall* notify the RWAP Manager if there is an issue with the designated laboratory receipt based on their permits or license. The WG *shall* ship the split sample to the laboratory under the RWAP billing codes for shipment and analysis with a DOE EM Nevada Program's Environmental Program Services contractor's chain-of-custody provided by RWAP.

The WG *shall* participate in resolution of any issues or questions arising from the sample results. RWAP will use DOECAP-accredited laboratories for chemical constituent verification analyses.

3.1.3.3 Alternative RWAP Verifications

Alternative verifications may be specified by WARP and documented on the WP approval form. These may include onsite reviews prior to removal and packaging, such as an asbestos abatement project. An onsite WP verification is another alternative verification and is an in-depth confirmation of the information in the WP. The WG *shall* ensure that personnel knowledgeable about the selected WP's generation, characterization, and packaging—preferably from the point of initial generation—are available for interviewing.

3.1.4 RWAP Assist Visit

Assist visits typically involve review of a new program, project, or corrective action implementation. RWAP will provide a written assist report, but the WG is not required to respond. RWAP will follow up on identified issues during subsequent FEs.

Assist visits may be requested in writing from the local DOE/NNSA site federal or project office to the DOE EM Nevada Deputy Program Manager, Operations.

3.2 Responding to Findings, Observations, and Discrepancies

A finding is issued whenever an NNSSWAC or WG internal procedure violation is discovered, including during an FE, upon waste receipt, or upon review of records. Findings are issued by DOE EM Nevada Program in writing to the local DOE/NNSA site office, or to the senior facility manager for non-DOE/NNSA sites. Program weaknesses noted during an FE will be noted as observations in the FE report. RWMC may notify the WG of discrepancies with shipping paperwork or packages that do not meet the definition of a finding. Findings, observations, and discrepancies are tracked by RWAP. The WG *shall* enter findings and observations in their internal issues management system consistent with DOE O 226.1B, *Implementation of Department of Energy Oversight Policy,* or equivalent.

3.2.1 Findings

3.2.1.1 Priority I Finding

A Priority I Finding is an issue documenting a regulatory violation or a deficiency from an NNSS requirement derived from site permits, the DAS, the DSA, or the site Nuclear Criticality Safety Evaluation (NCSE) that represents a substantial risk and liability to the NNSS. These requirements are denoted by the bolded ***shall*** requirements in the AWAC and TWAC. A Priority I Finding may also be issued for systemic issues that indicate serious programmatic weaknesses. The WG *shall* perform an extent-of-condition evaluation, a root cause analysis (RCA) to a recognized industry protocol to formally identify the primary cause(s) of the finding, and generate a corrective action plan (CAP) to prevent recurrence.

The CAP *shall* specify completion dates and objective evidence. The WG *shall* provide the CAP and subsequent closure evidence to the local DOE/NNSA site representative for submission to the DOE EM Nevada Deputy Program Manager, Operations. For commercial TSDFs or other non-DOE/NNSA facilities, the senior facility manager *shall* submit the CAP and subsequent closure evidence to the DOE EM Nevada Deputy Program Manager, Operations. Priority I Findings will be reviewed by WARP, and the WG *shall* respond to any requests for information until WARP deems the CAP acceptable. The CAP *shall* specify the schedule for implementation, and WARP will specify evidence (if any) to be submitted for review or requirements for an onsite review prior to closure of the Priority I Finding.

The WG *shall* perform and document a corrective action effectiveness review for a Priority I Finding within twelve (12) months of closure. The results of the effectiveness review *shall* be submitted to the DOE EM Nevada Deputy Program Manager, Operations.

The DOE EM Nevada Program Manager will evaluate each Priority I Finding to determine whether a program and/or WP suspension will be issued. Suspensions and reinstatements are discussed in Sections 3.3.2 and 3.3.3, respectively.

3.2.1.2 Priority II Finding

A Priority II Finding is an issue documenting a noncompliance with an internal WG requirement or NNSSWAC requirement not related to a regulation, the permit(s), the DAS, the DSA, NCSE requirements; or is determined not to be a substantial risk and liability to the NNSS and is denoted as a non-bold *shall* statement. The WG *shall* enter into their issues management system; perform an extent-of-condition, causal analysis in accordance with their site protocols; and submit a CAP to prevent recurrence. The CAP *shall* specify completion dates and objective evidence to be submitted. The WG *shall* provide the CAP to the local DOE/NNSA site office for submission to the DOE EM Nevada Deputy Program Manager, Operations. For commercial TSDFs or other non-DOE/NNSA facilities, the facility manager *shall* submit the CAP to the DOE EM Nevada Deputy Program Manager, Operations. Once CAP actions are complete, the local DOE/NNSA site office or facility manager submits closure evidence to the DOE EM Nevada Deputy Program Manager, Operations. RWAP will review closure documentation of Priority II Findings.

3.2.2 Observations

Observations are noted through FEs. An observation has no current impact to compliance but, if left unaddressed, could result in an NNSSWAC or regulatory noncompliance in the future. The WG *shall* enter observations in their issue management system. The WG *shall* provide a written response to observations to the DOE EM Deputy Manager, Operations stating what actions will be taken or the rationale for no action. Observations closed during the FE do not require a written response. RWAP will review observation closure actions, if taken, during subsequent FEs.

3.2.3 Reserved

3.2.4 Discrepancies

Discrepancies are items noted by RWMC personnel upon receipt of paperwork or packages (e.g., damaged labels or TIDs). When requested, the WG *shall* submit discrepancy responses directly to the RWMC Waste Operations Supervisor. Discrepancies are reviewed by the RWAP Manager to determine whether a finding is justified.

3.3 Program Approvals, Suspensions, Reinstatements, and Closures

3.3.1 Program Approval

Upon completion of an onsite audit, closure of any corrective actions, and approval of a WP, the WP approval letter and associated form will be issued to the local DOE/NNSA site office, or to the senior facility manager for a commercial TSDF or other non-DOE/NNSA facility. Upon receipt of the WP approval letter, the WG may schedule shipments in accordance with Section 11.0.

3.3.2 Program Suspension

The DOE EM Nevada Program Manager has the authority to suspend a WCP due to any of the following:

- A Priority I Finding
- Regulatory statute or permit violation related to waste shipped to the NNSS
- Improper shipping paperwork (e.g., incorrect nuclide inventory or activity level reported)
- Repetitive program deficiencies
- Radiological contamination or dose event
- Incorrect waste characterization
- Waste container integrity deficiency
- Transportation routing or in-transit violation
- Inadequate nuclear criticality safety determination
- Extensive Priority II Findings noted during an RWAP FE
- Significant validated ORPS event or external assessment findings
- Any other issues the DOE EM Nevada Program Manager deems a risk to the NNSS

A WG may voluntarily suspend their WCP. The WG *shall* notify the RWAP Manager and their local DOE/NNSA site office if they self-suspend. WP suspensions are discussed in Sections 4.4 and 4.5.

3.3.3 Program Reinstatement

For WG self-suspensions, CAPs *shall* be submitted to the DOE EM Nevada Deputy Program Manager, Operations. The DOE EM Nevada Deputy Program Manager, Operations will provide a written response to the local DOE/NNSA site program or senior facility manager for non-DOE/NNSA sites either requesting further information, requiring an FE, or authorizing scheduling shipments in accordance with Section 11.0.

For suspensions issued by the DOE EM Nevada Program Manager, an audit is required prior to reinstatement. Prior to scheduling the audit, the local DOE/NNSA site office or senior facility manager will submit a declaration that corrective actions are complete and the WG WCP is compliant with the NNSSWAC based on an independent assessment. RWAP will conduct an audit after reviewing of the independent assessment.

WARP will review corrective actions, independent assessments, and audit results. Upon acceptance of the WG's corrective action evidence, WARP will make a recommendation to the DOE EM Nevada Program Manager to reinstate the WCP. Upon receipt of the reinstatement letter from the DOE EM Nevada Program Manager, the WG may resume scheduling shipments in accordance with Section 11.0.

3.3.4 Program Closure

WGs *shall* notify the DOE EM Nevada Program Deputy Manager, Operations via email or letter if they no longer intend to ship waste to the NNSS under their WCP. The notification may be submitted by the site contractor, commercial site, project contractor, or the cognizant local DOE/NNSA site office.

4.0 Waste PTNs and WPs

WGs *shall* ensure that WPs and waste PTNs have a documented characterization basis in accordance with Section 5.0.

4.1 Pre-Treatment Notifications

The WG *shall* complete a PTN for RCRA characteristic hazardous waste undergoing treatment to remove the hazard prior to disposal as LLW and for any RCRA hazardous waste undergoing treatment to render it compliant with LDRs. PTNs are not required for hazardous debris being treated via macroencapsulation.

The WG *shall* upload unclassified PTNs via SharePoint. The WG *shall* contact the RWAP Manager for directions on submitting classified PTNs. PTNs will be reviewed by WARP.

4.2 WP Requirements

The WG *shall* complete a WP for each waste stream proposed for disposal in accordance with the associated WP instructions. The eProfile system located on the SharePoint site *shall* be used for completion and submission of WPs that do not contain classified information. Profile A is used for LLW (including classified waste with no hazardous constituents) and for LLW with polychlorinated biphenyls (PCBs) or RACM that are authorized for disposal in a State-permitted municipal or non-municipal non-hazardous waste landfill. Profile B is used for MLLW (including non-radioactive classified hazardous waste) and for wastes with PCBs required to be shipped on a Uniform Hazardous Waste Manifest (UHWM).

The WG *shall* ensure that waste included on a WP originates under a single EPA generator number unless it is transported to a central accumulation site or to a commercial TSDF for treatment or management. The WG *shall* be responsible for documenting the commonality of wastes included on a WP. Commonality may be defined by any of the following:

- Waste physical, chemical, and/or radiological properties
- The generation source
- Common waste processing

New WGs *shall* enter at least one (1) WP in eProfile prior to the initial program audit.

For MLLW and classified hazardous waste, the number of containers will be used to determine the percentage of verifications required under the NNSS RCRA Part B Permit. The WG *shall* revise the WP if the number of containers changes by more than ten (10) percent, impacting the number of verifications required.

The WG *shall* have WPs reviewed by an Authorized Derivative Classifier/Reviewing Official (DC/RO) prior to submission. Directions for recording this review are available in the eProfile instructions. The WG *shall* contact the RWAP Manager if the WP is classified or if classified information associated with a WP is required to be transferred.

The WG *shall* provide a letter authorizing permanent burial for classified matter/waste.

4.2.1 Wastes To Be Profiled Separately

The WG ***shall*** profile the following wastes separately from other wastes based on the waste characteristics, regulatory classification, or handling procedures: A.3.2

- RACM requiring disposal in the Solid Waste Permitted SW 532 landfill
- LDR-compliant MLLW
- LDR-compliant classified hazardous waste
- RCRA waste treated under a Treatability Variance
- RCRA waste subject to a "Contained-in" Determination
- RCRA waste treated under a Determination of Equivalent Technology
- Formerly RCRA characteristic waste that has undergone treatment to remove the characteristic
- PCB waste disposed under Risk-Based Disposal Authorizations
- Combined PCB/RCRA/RACM
- Classified waste

- Sealed sources greater than 100 μCi
- DOE/NNSA wastes originating and shipped from non-DOE/NNSA sites unless being shipped from a commercial TSDF
- Soils originating from U.S. Department of Agriculture (USDA) fire ant quarantine areas
- Wastes originating from international sites
- Wastes shipped using Federal Drivers
- Highway Route Controlled Quantity (HRCQ) wastes or Super Loads
- Waste shipped in U.S. Department of Transportation (DOT) Certificate of Compliance (COC) Type B casks
- Wastes or material submitted that have specified time and/or temperature limits associated with the packaging (e.g., waste in a model 9979 package)
- WPs with Category II (or greater) quantities of special nuclear material
- Test specimens of fissionable material irradiated for research and development

Note: WGs ***shall*** submit documentation for appropriate state or federal regulatory agency approved RCRA Treatability Variance(s), Risk-based Disposal Approval(s), Contained-in Determination(s), and Determination(s) of Equivalent Technology to the RWAP Manager via SharePoint if submitted prior to the WP or with the associated WP submitted via SharePoint.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) waste is not required to be profiled separately. If the NNSS were to cease being eligible to receive CERCLA waste, any WP listing CERCLA would be suspended.

The WG *shall* provide the rationale for combining RACM with RCRA and/or PCB waste in the WP. [A.2.2]

4.2.2 Adding New Waste Streams to an Existing WP

The WG *shall* evaluate wastes to be added to an existing WP in accordance with the criteria specified in Section 4.2.1. The WG *shall* identify waste streams added to an existing WP during the annual WP recertification as described in Section 4.3.

WPs submitted by commercial TSDFs *shall* identify each source DOE/NNSA generator. When adding a new DOE/NNSA generator to an existing WP, the commercial TSDF *shall* request an expedited review via the eProfile and specify how the WG's waste was evaluated for inclusion on the WP. The commercial TSDF *shall* contact the RWAP Manager via email if adding a new DOE/NNSA generator that is not listed as an NNSS generator in Appendix E.

4.2.3 NNSSWAC Deviations

Deviations may be submitted with a WP or submitted using the Request for Standalone Deviation from NNSSWAC Requirements. Standalone deviation requests are to be uploaded via SharePoint.

WP deviations from bolded ***shall*** statement requirements (AWAC and TWAC) may require additional stakeholder involvement and/or controlling document (e.g., permit, DSA) revisions.

4.2.4 WARP Evaluation

WARP consists of NNSS technical, operations, and regulatory SMEs who review and advise DOE EM Nevada Program on PTNs, WPs, and annual recertifications. WARP makes recommendations to the DOE EM Nevada Deputy Program Manager, Operations for approval or rejection of WPs and other documents. WARP also makes recommendations on reinstatements of suspended WPs or WCPs. The WG *shall* participate in WARP or provide information as requested by the WARP Chair.

4.2.5 Expedited Review

Expedited reviews may be requested through the eProfile. The generator *shall* enter the rationale for the changes and make the necessary revisions. RWAP will set the date for WARP review.

4.2.6 WP Approval

WP approvals are issued by the DOE EM Nevada Deputy Program Manager, Operations via a signed approval form. The form will designate the disposal cell category (i.e., DOE O 435.1 cells, RCRA permitted cells, Solid Waste permitted cells). The WG ***shall*** comply with any

provisions specified on the WP approval form. The following subsections describe possible provisions.

4.2.6.1 Verification Requirements

WP approval forms may specify verification requirements including the method (i.e., visual verification, sampling, RTR) and frequency. Verification requirements for MLLW or classified hazardous waste may be specified in the approved PTN. Further information on verifications is included in Section 3.1.3.

4.2.6.2 Conditional WP Approval

WP approval forms issued as "Conditional Approval" notify the WG that the waste described on a WP is acceptable for burial, but administrative documentation (e.g., Transportation Plan, Lift Plan) is required to be submitted for review. The WG *shall* submit documentation to the RWAP Manager or SME as noted on the Conditional Approval form and will address any conditions that must be satisfied prior to scheduling shipment.

4.2.6.3 Approval with Deviations, WP Limitations, or Special Instructions

WP approval forms may include approved deviations, specific WP limitations (e.g., total allowable curies), and/or special instructions. Special instructions may apply to the WG or to the RWMC; the approval form will clearly identify the responsible organization. The WG *shall* adhere to limitations or WG special instructions; failure to do so may result in a finding or WP suspension.

4.3 WP Annual Recertification

The WCO *shall* perform a documented annual review of WPs to ensure the characterization data, waste stream information, and referenced procedures are valid. The review date will be based on the DOE EM Nevada Deputy Program Manager, Operations WP approval date recorded on the approval form.

The WCO *shall* document on a Profile Annual Recertification Request or equivalent the review and any new waste streams added to the WP.

The WG *shall* upload WP recertifications via SharePoint for MLLW and classified hazardous waste. The DOE EM Nevada Deputy Program Manager, Operations will sign the recertification form that will specify any outstanding required verifications after review by WARP.

LLW and non-radioactive, non-hazardous waste recertifications are not required to be submitted via SharePoint but *shall* be available for review during FEs or upon request.

4.4 WP Cancellation or Suspension by WG

The WG may cancel or suspend a WP by submitting a Waste Profile Status Change Notification via SharePoint. WGs are requested to cancel WPs when the site does not anticipate shipping any additional waste under the WP. WGs may choose to suspend a WP that may be used in the future but under which there is not current or near-term generation.

WG-suspended WPs do not require an annual WP assessment. To lift a self-imposed suspension, the WG *shall* complete a Profile Annual Recertification Request confirming that the WP is still valid. The WG *shall* submit the recertification to the RWAP Manager via SharePoint. The recertification and the WP will be reviewed by WARP; upon resolution of any comments, the WP will be recommended for reinstatement, and an approved recertification form and letter will be issued.

4.5 WP Suspensions by DOE EM Nevada Program

The DOE EM Nevada Deputy Program Manager, Operations may suspend a WP if there is evidence that the WP does not accurately describe the waste, or if the WG is not complying with the approval provisions (e.g., special instructions, limitations). A Priority I or II Finding may be issued in addition to the suspension.

WP suspensions will be issued by the DOE EM Nevada Program Manager to the local DOE/NNSA site personnel or to the commercial facility senior facility manager with the basis for suspension. The WG *shall* respond to the suspension and any associated findings in accordance with Section 3.2. The WP and CAP will be reviewed by WARP in accordance with Section 4.2.4.

5.0 Waste Characterization

The WG ***shall*** characterize waste with sufficient accuracy to determine correct regulatory categorization, segregation, treatment, storage, and disposal. A.1.3 The WG ***shall*** ensure characterization methods and procedures employed identify the chemical, physical, and radiological characteristics of the waste during each phase of the waste management process starting at the point of generation. A.1.3 The WG ***shall*** ensure characterization data sources for legacy waste meet the criteria specified under this NNSSWAC or ***shall*** obtain supplemental data either through sampling, inspection, or other documented method. A.1.3 The WG ***shall*** use documented characterization protocols (e.g., sampling technique, measurement method, process knowledge [PK] basis) to obtain data to complete the WP and each PSDR. A.1.3 The WG ***shall*** ensure that chemical and radiological characterization data— including sampling records, laboratory reports, survey records, and field measurements—are traceable to the items or container sampled or measured. A.1.4

Characterization data will be considered "historical data" if greater than five (5) years old or if not generated contemporaneously to the waste to be profiled. The WG *shall* document their process for determining the representativeness of historical data. The WG *shall* sample wastes that are produced from engineered systems on a continuous basis and that are amenable to sampling (see Section 5.1) on either a defined batch basis or on a periodic basis not to exceed two (2) years.

The WG *shall* ensure that associated measurement and test equipment (M&TE) is traceable to associated calibration records. The WG *shall* have defined validation and verification criteria for software associated with waste characterization. The WGs *shall* also have work processes for performing independent verification and validation of spreadsheets and other data used to support waste characterization and profiling.

The WG *shall* identify on the WP waste components that equal or exceed one (1) percent of the volume of the overall waste stream for characterization. Secondary wastes, such as associated personal protective equipment or plastic sheeting disposed with the primary waste stream, are not required to be characterized separately.

The WGs *shall* document how waste characterization data are used to complete the information on the WP and the PSDR. WGs are encouraged to include technical basis documents or similar documents for detailing chemical and radiological characterization when submitting a WP. The WGs *shall* provide the following information either in the WP or supporting documentation:

- Waste description and source
- Characterization data source
- Data validation (chemical and radiological)
- Derivation of information reported on the WP (e.g., determination of high activity values)
- Regulatory status discussion (e.g., how characterization data support a waste stream is LLW not MLLW)
- Discussion of demonstrating NNSSWAC compliance (e.g., plutonium equivalent gram determination below allowable limits, fissile gram exceptions)
- Any other information pertinent to the characterization and categorization of the waste

5.1 Chemical Characterization

The WG *shall* prioritize empirical data over PK for chemical characterization of wastes amenable to sampling (e.g., granular waste such as soil, grit, or resins; filter media) when determining the following:

- Regulatory status under 40 CFR 261, Subpart C
- Compliance with LDR status under 40 CFR 268.40
- Regulatory status under 40 CFR 761

The following wastes are exempted from sampling for chemical characterization:

- Waste known to be subject to an LDR-specific technology-based treatment standard
- Waste, environmental media, and/or debris from the cleanup of a singular, contemporary spill; or release of a single substance, commercial product, or otherwise known material (e.g., material for which a Safety Data Sheet [SDS] can be provided)

The WG *shall* document in the WP when material amenable to sampling is characterized by alternate means. Rationale may include the following:

- Elevated dose rates necessitating a specific ALARA plan for sampling
- Presence of asbestos, beryllium, or other chemical or physical hazards
- Sampleable material interspersed within a debris waste stream

Debris is not considered amenable to sampling. The WG *shall* have a documented basis for declaring debris as non-hazardous. The WG may declare the debris as hazardous without providing a documented basis.

To prepare for emerging regulation, the WG is requested to provide available PK and/or empirical data associated with per-and polyfluoroalkyl substances (PFASs) on the WP.

5.1.1 Data Requirements

The WG *shall* collect analytical characterization data in accordance with written sampling and analysis plans (SAPs), sample request forms, or similar documentation. The documentation *shall* specify the sampled items or bounded sample population, representative sampling method, measurement method, and applicable procedures. The planning documentation and characterization data *shall* be traceable to the waste profiled and shipped.

5.1.2 DQO Development

The WG *shall* develop a data quality objectives (DQOs) process as described in *Guidance on Systematic Planning Using the Data Quality Objectives Process,* EPA QA/G-4; or an equivalent process. [A.1.3] The WG *shall* provide results of the DQO process upon request. Analyses performed on single debris items in accordance with WG procedures are not required to have DQOs. Other sampling events exempt from documented DQOs include the following:

- Sampling applied dried paint on debris items for RCRA metals analysis
- Sampling debris to confirm PK
- Sampling PCB bulk product waste in accordance with protocols defined in 40 CFR 761, Subpart R to determine leachability
- Sampling oil or other fluids from fluid-filled equipment for PCB article determination

- Sampling oily residues on debris items for PCB contamination determination
- Asbestos sampling performed by certified asbestos personnel in accordance with standard industry methods

The WG *shall* document protocols for managing sampling uncertainty in procedures or specific project documentation (e.g., SAP or DQO statements). Management of uncertainty considerations include application of uncertainty from sampling when determining WP ranges, evaluating specific items or packages for WP compliance, and assigning shipping values.

5.1.3 Chemical Characterization Methods and Laboratory Requirements

The WG ***shall*** utilize SW-846*, Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*, for characterization of RCRA constituents and for demonstrating compliance with LDRs unless another method is specified in the RCRA regulations (e.g., ASTM for Flashpoint). The WG ***shall*** utilize SW-846 methods for PCB analysis.

The WG *shall* use a Nevada certified laboratory, DOECAP-accredited laboratory, or laboratory certified by a state authority that specifically certifies SW-846 methods.

There are no specific methods for PFASs in waste matrices. The WG is requested to note any data available regarding PFASs in the WP.

5.1.4 Chemical Data Validation

The WG *shall* use validated data for RCRA and PCB determinations. A minimum of ten (10) percent of data *shall* be validated in accordance with EPA guidelines applicable to the selected analytical method. Data validation *shall* be performed by technically qualified personnel who are independent of those performing the analyses. The WG *shall* provide data validation reports upon request.

5.1.5 Chemical Characterization Profile Reporting

The WG *shall* report analytical results on the WP RCRA tab (RWAP-FR-012, NNSS Profile Data Tables, RCRA Data tab) and attach to the eProfile. The WG *shall* revise the WP RCRA tab if subsequent analysis exceeds eighty (80) percent of the regulatory threshold. The WG *shall*

provide data reports for RCRA and PCB chemical characterization data when submitting a new or revised WP RCRA table. If analyses are conducted on wastes approved on the basis of PK, no revision to the WP is required if the analyses confirm the PK, regardless of the eighty (80) percent regulatory threshold.

5.1.6 Chemical Characterization Process Knowledge

Acceptable sources of information used to support the PK basis include, but are not limited to, the following:

- Material inputs, including SDSs
- Manufacturing specifications
- Mass balance documentation
- Laboratory notes and batch records
- Process procedures, logs, and batch records
- Process design information, including classified design information
- Historical analytical data
- Interviews with persons knowledgeable of the waste

The WG *shall* include a documented evaluation of compiled PK sources used for waste characterization in the WP that addresses uncertainties, inconsistencies, and limitations. The WG *shall* document how the PK is supported by other characterization data. The WG *shall* document living memory statements. Emails identifying the sender and recipient are acceptable, as are statements signed by the interviewer and interviewee.

5.2 Radiological Characterization

The WG *shall* determine the radioactivity (quantity of disintegrations per time) of the waste and the reportable radionuclides in accordance with the criteria defined in TWAC Section 3.1.4, "Radionuclide Content or Concentration." Radiological characterization methods include, but are not limited to, the following:

- PK
- Gross radiation measurement
- Scaling factors
- Nondestructive assay (NDA)
- Modeling
- Sampling and analysis

These methods may be used singularly or in combination. The process *shall* consider physical limitations such as waste matrices that cannot be representatively sampled due to radiation emission rates or inaccessibility to internal surfaces.

The WG *shall* use standard planning methodology such as the DQO process as described in *Guidance on Systematic Planning Using the Data Quality Objectives Process*, EPA QA/G-4; the *Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)*, DOE/EH-0624, Rev. 1; or other documented rationale when using statistical sampling for a population of waste. A.1.3 Gross radiation measurements performed in accordance with Section 5.2.1, and NDA measurements performed on single items or containers in accordance with Section 5.2.3 are not required to have documented DQO determinations or equivalent. The WG *shall* design the radiological characterization plan considering the potential of the waste stream to exceed the waste concentration action levels (TWAC, Table 3-4). The WG ***shall*** identify radionuclides with a reasonable probability of exceeding one (1) percent of the waste concentration action level. A.3.3 Waste streams or waste packages having activity concentration of radionuclides in the final waste form at one (1) percent or greater than the action levels (TWAC, Table 3-4) or have transuranic (TRU) waste radionuclides with concentrations that exceed one (1) nCi/g require rigorous characterization. Rigorous characterization is a combination of methods to adequately determine the activity of the waste that may include a combination of PK, sampling and analysis, and NDA.

The WG *shall* retain documentation regarding the basis of radiological characterization, actual data, and the interpretation of data. The WG *shall* provide information upon request.

5.2.1 Gross Radiation Measurements

The WG *shall* plan and execute collection of gross radiation measurements in accordance with documented procedures. WGs *shall* document scaling factors developed that relate gross radiation measurements to waste stream activity concentrations. The WG *shall* collect direct survey readings or wipes in accordance with written survey plans, survey request forms, or similar documentation traceable to the waste to be profiled and/or shipped. The WG *shall* document the basis of radionuclide distributions. The WG *shall* verify distributions for ongoing processes a minimum of every five (5) years. The WG *shall* document factors considered when

developing scaling factors including, but not limited to, waste package and detector geometry, shielding and attenuation effects, self-absorption, and the energy spectra and decay schemes of radionuclides in the waste. The WG *shall* provide documentation upon request.

The WG *shall* ensure that modeling used in conjunction with gross radiation measurements is conducted using accepted industry software (e.g., Microshield or Radman); is used by trained and qualified personnel; and its application for the specific waste is peer reviewed by another independent trained and qualified person.

5.2.2 Radiochemical Sampling and Analysis

The WG *shall* collect and analyze radiological samples in accordance with written SAPs, sample request forms, survey request forms (for the collection of wipes), or similar documentation. The documentation *shall* specify the sample items or bounded sample population, measurement method, and applicable documented procedures.

The WG *shall* ensure that radiochemical procedures used for laboratory analyses are peer reviewed and controlled if not conducted by a DOECAP-accredited laboratory. The WG *shall* ensure the procedures address propagation of error and management of uncertainty. A minimum of ten (10) percent of data *shall* be validated in accordance with documented criteria.

5.2.3 Nondestructive Assay

The WG *shall* plan and execute NDA in accordance with documented procedures. The WG *shall* document the basis for the selection of NDA detection systems for the waste items being measured. The WG *shall* ensure analysis of acquired data includes estimation of total measurement uncertainty and the use of statistical techniques for analysis, including quality control data. The WG *shall* have a documented protocol for reporting uncertainty for data used for NNSS shipments. The WG *shall* validate NDA data using written procedures by technically qualified personnel who are independent of those performing the analyses. The WG *shall* provide instructions, standards, manuals, operator aids, and reference data upon request.

WG NDA programs certified by the Carlsbad Field Office meet NNSS requirements.

5.2.4 Radiological Characterization Process Knowledge

Acceptable sources of information used to support the PK basis include, but are not limited to, the following:

- Material Control and Accountability information
- Existing waste analysis data
- Data from similar waste generating processes
- Plans and drawings
- Areas and/or buildings of waste origin
- Material inputs
- Manufacturing specifications
- Material manifests
- Mass balance documentation
- Literature searches
- Laboratory notes and batch records
- Process logs and batch records
- Procedures
- Living memory (documented interviews)

The WG *shall* include a documented evaluation of compiled PK sources used for waste characterization in the WP that addresses uncertainties, inconsistencies, and limitations. The WG *shall* document how the PK is supported by other characterization data. The WG *shall* document living memory statements. Emails identifying the sender and recipient are acceptable, as are statements signed by the interviewer and interviewee.

5.2.5 Documenting Reportable Radionuclides

The WG *shall* ensure data generated in support of rigorous characterization undergoes a peer review that assesses all inputs as well as calculations in determining reportable radionuclides.

The WG ***shall*** identify reportable radionuclides in accordance with TWAC Section 3.1.4, "Radionuclide Content or Concentration." [A.1.2] The WG *shall* record the activity concentrations representative of the waste stream on the WP. The WG *shall* record the activity for each individual container or item on the PSDR. [A.1.2] Any nuclide identified on the PSDR *shall* be on the WP, and the activity may not exceed the highest activity reported on the WP. [A.1.2]

The WG ***shall*** determine waste activity concentration based on the volume of the final waste form as offered for disposal. A.3.3 Measurement or analysis of samples may be performed prior to final processing if the measured activity concentration can be related to the final activity concentration. The volume of the waste can be taken as the internal volume of the container if the radionuclides are homogeneously distributed throughout the waste and the waste fills at least ninety (90) percent of the waste container. When these conditions are not met (significant void space, or contains irregularly shaped equipment or components), the volume ***shall*** be taken as the volume occupied by the waste in the container. A.3.3 The TRU activity concentration ***shall*** be based on the mass of the contents of a single waste disposal container, excluding the mass of the container and any shielding present. A.3.3

The WG ***shall*** calculate the activity concentration of TRU radionuclides in units of nCi/g and be based on the mass of the contents of a single waste disposal container, excluding the mass of the container and any shielding present. A.3.3 The WG ***shall*** consider these radionuclides when making the TRU waste determination: ^{237}Np, ^{238}Pu, ^{239}Pu, ^{240}Pu, ^{242}Pu, ^{244}Pu, ^{241}Am, ^{242m}Am, ^{243}Am, ^{243}Cm, ^{245}Cm, ^{246}Cm, ^{247}Cm, ^{248}Cm, ^{250}Cm, ^{247}Bk, ^{249}Cf, ^{251}Cf. A.3.3

The WG ***shall*** ensure isotopic distributions and corresponding activity concentrations are traceable to the individual package or item if characterization is being conducted at that level (e.g., individual sealed sources, individual items subjected to NDA or survey). A.1.2

6.0 Waste Packaging and Lifting Devices

The WG *shall* identify waste packaging to be used on the WP. A listing of standard packaging with the appropriate NNSS Disposal Operations codes is embedded in the eProfile system. Contact the RWAP Manager if a container is not listed in the eProfile system.

6.1 Minimum Package Design Criteria

The WG ***shall*** maintain documentation demonstrating that waste packages meet applicable DOE directives; and 10 CFR, 40 CFR, and 49 CFR requirements, as applicable. The WG ***shall*** consider chemical compatibility, nuclear safety, radiation levels, activity limits, nuclear heating, and any other hazards associated with the waste to be packaged. The WG *shall* ensure packages can withstand the stresses associated with the loading, handling, stacking, and transporting during shipment to the NNSS to avoid breaching or release of material.

The WG ***shall*** adhere to any additional requirements for specific types of waste—including particulates, asbestos, and beryllium—as specified in the TWAC.

6.2 Standard Industrial Packaging Criteria

The WG ***shall*** ensure that procured packages, including soft-sided packages, used for shipping, at a minimum, meet Industrial Package-1 (IP-1) requirements as specified in 49 CFR 173.410 and 173.411. Additional NNSS requirements are detailed in the following subsections. If a container is not listed in the following subsections, there are no additional requirements above meeting IP-1. Activity limits for waste packages are included in TWAC Section 3.1.6, "Activity Limits." Limits for fissile packages are included in TWAC Section 3.1.5, "Fissile Material and Nuclear Criticality Safety."

6.2.1 Boxes

The WG *shall* ensure the package (steel or wooden box and contents) is capable of supporting a uniformly distributed load (compressive strength) of 3,375 lb/ft^2. The WG *shall* have design engineering calculations or physical testing to demonstrate compliance. The WG *shall* ensure

that boxes are designed for use with forklifts. The WG *shall* ensure that fork pockets on lids do not extend beyond 4 inches from the lid.

Boxes not meeting the strength requirement *shall* require a WP deviation and be clearly marked "Box Does Not Meet NNSSWAC Strength Requirement," at a minimum, on the top and one side.

6.2.2 Intermodal

The WG *shall* ensure that each intermodal is at least 6 ft × 8 ft × 20 ft. The WG *shall* record intermodals with alternate sizes as deviations on the WP. The WG *shall* ensure intermodal or roll-off containers meet the following criteria:

- Liners for scrap metals and debris are a minimum of 18 mil
- Liners for contaminated soil are a minimum of 12 mil
- Containers are constructed to allow off-loading through the rear doors without opening the top lid
- Containers have hardware to secure the rear doors in the open position during off-loading

If the intermodal is shipped with the intent to be buried as delivered, these requirements do not apply. Additional requirements for loading are included in Sections 7.3 and 9.1.2.

6.3 COC Containers

The WG *shall* provide the container or cask identification on the WP. The WG *shall* ensure requirements and instructions regarding the receipt, inspection, loading, storage, handling, and shipment of the containers are incorporated into work instructions either directly or through reference.

6.3.1 DOE-Issued COC Containers

The WG *shall* list DOE-issued COC and Safety Analysis Report (SAR) references on the WP and provide them upon request. The WG *shall* notify the RWAP Manager of WP(s) impacted by revisions to a COC and/or SAR prior to subsequent shipments.

6.3.2 Casks

The WG *shall* identify any liner, inner container, or item to be removed from a cask or overpack for burial at the RWMC on the WP. If the liner, inner container, or item to be removed for burial exceeds 300 PE-g but is less than 12,000 PE-g, the WG *shall* provide documentation that it meets the minimum requirements of a DOT Type A container with the WP as a deviation request.

The WG *shall* provide the Type B COC with the WP. The WG *shall* provide Sections 1, 7, 8, and, if applicable, 9 of the SAR to the RWMC Waste Operations Supervisor at WMINFO@nv.doe.gov.

A list of Type B shipping containers/casks the RWMC can accept is available from the RWMC Waste Operations Supervisor. The WG *shall* notify the RWMC Waste Operations Supervisor a minimum of one hundred and eighty (180) days in advance if a Type B cask not on the list is to be used to allow adequate time for registration, and development of work instructions and lift plans. If disassembly and return of the cask is required, and the complexity of the cask warrants, the RWMC Waste Operations Supervisor may require a dry run or mock-up with the cask prior to an actual waste shipment.

The WG *shall* provide a U.S. DOT Competent Authority Certification (CAC) for casks that are certified in countries other than the United States with the WP.

6.4 Non-standard Packaging

The WG *shall* ensure that the following requirements are met for packages not procured as IP-1 packages or COC containers.

6.4.1 Unpackaged Equipment

The WG ***shall*** ensure that item lifting devices are designed to meet the criteria specified in Section 6.5. The WG ***shall*** render any structural part of the package that cannot be demonstrated to meet the strength equivalent inoperable for lifting the package prior to transport.

6.4.2 Macroencapsulation System Packaging

The WG ***shall*** ensure that macroencapsulation systems satisfy the RCRA technology-based treatment standards (40 CFR 268.42) or treatment standards for hazardous debris (40 CFR 268.45) and are loaded and closed in accordance with manufacturer's instructions. The WG *shall* identify the manufacturer and describe the package on the WP. The WG *shall* configure the package to ensure no damage can be inflicted on the polymer during normal handling, transport, or waste placement.

Macroencapsulation systems evaluated for acceptance at the NNSS are listed on SharePoint. WGs *shall* submit performance documentation for IP-1 determination and macroencapsulation performance for macroencapsulation systems not listed on SharePoint either prior to submission of a WP or as part of the WP.

6.4.3 Containerized Gas Packaging

The WG ***shall*** ensure LLW in a gaseous form is packaged such that the pressure does not exceed 1.5 atmospheres absolute at 20 degrees Celsius (°C). [A.1.2] The WG ***shall*** consider quantities of gases potentially generated when determining packaging. Gases ***shall*** not exceed the confinement capability of the container. The WG *shall* provide the design engineering calculations or physical testing with the WP.

6.5 Hoisting and Rigging Equipment

The WG ***shall*** ensure that lifting devices provided are designed and tested in accordance with DOE-STD-1090 (Current Revision), *Hoisting and Rigging*. The WG should contact the RWMC Waste Operations Supervisor early in the planning process to determine whether any additional NNSS requirements are required to be met.

The WG ***shall*** evaluate and document lifting devices for the following (including slings, hardware, and lifting fixtures): [A.1.5]

- Load testing at a minimum of the two hundred (200) percent working load limit for slings and rigging hardware provided for use with the shipment container.

- Inspection verifying rigging is manufactured in the United States and is not counterfeit.
- Receipt inspection verifying rigging is free from any signs of corrosion, kinking, bird caging, or other deterioration.
- Load testing for below-the-hook lifting devices between eighty (80) percent and one hundred and twenty-five (125) percent of rated capacity.

The WG *shall* verify all lifting points (e.g., eyes, lugs, rings, connection point) integral to the waste package do not extend greater than 0.1 m (4 inches) in the normal position.

No less than seven (7) days prior to shipment receipt, the WG *shall* provide traceable certificates attesting to lift capacity and a current load test based on DOE-STD-1090 requirements for supplied rigging to the RWMC Waste Operations Supervisor at WMINFO@nv.doe.gov.

For equipment with integrated lifting devices, the WG ***shall*** provide calculations from a qualified engineer verifying that lifting devices that are a structural part of the package are designed with a minimum safety factor of three (3) to one (1) against yielding when used to lift the package. A.1.5

The WG *shall* specify in the WP if any part of the waste stream requires the use of a crane to handle or off-load the waste/disposal package, shipping container, or cask.

The WG *shall* specify in the WP whether soft-sided containers are to be off-loaded/handled using the integrated straps, a separate lifting device, or a forklift (i.e., palletized).

7.0 Package Loading, Closure, and Marking/Labeling

Specific package loading requirements regarding the waste content are included in the TWAC. The TWAC includes requirements regarding void space, liquids, gases, and allowable radioactivity and fissile gram loading.

The WG *shall* ensure that container contents are loaded in the most stable configuration.

The WG *shall* manage waste loading to minimize void space within containers and minimize disposal volume as practicable. Waste from different WPs may be packaged in a single container. Waste listed in Section 4.2.1 is prohibited from commingling with the exception of formerly MLLW treated to remove a characteristic being shipped as LLW and combined PCB/RCRA/RACM.

7.1 Absorbent

The WG ***shall***, considering the waste and environmental conditions, add absorbent material during packaging as necessary to prevent any accumulation of free liquids inside the container, either from precipitation penetration or from condensation during handling, storage, and transport. A.1.2, A.3.1 The WG ***shall*** ensure absorbent added to MLLW, non-radioactive hazardous classified waste or any waste that is disposed in the permitted hazardous waste cells is non-biodegradable. The WG *shall* document the basis for the volume of absorbent added and provide upon request.

7.2 Package Weight Limits

The WG ***shall*** obtain package weights from calibrated scales. A.1.1 The maximum weights for RWMC routine operations are listed on Table 7-1. The WG ***shall*** ensure no package exceeds the manufacturer's design weight limit.

Table 7-1
Maximum Weights without a Deviation

Container Type	Maximum Weight (lb Gross)
Drums up to 110 gal	1,200
Steel Box[1] (approximately 4 ft × 4 ft × 6 ft)	9,000 (closed van); 11,000 (Conestoga or flatbed trailer)
Cargo	80,000
Intermodal	42,000 if to be returned; 80,000 if to be disposed

[1] No deviation is required for macroencapsulation packaging systems with a tare weight exceeding the listed weights.

There are no specified weight limits for soft-sided containers or equipment, but the estimated maximum weight is to be recorded on the WP. The RWMC Waste Operations Supervisor will notify the WG of estimated costs to be borne by the WG prior to the shipment of packages or equipment requiring specialized lifting and handling equipment.

7.3 Intermodal Loading Requirements

The requirements for intermodal containers *shall* apply to waste transferred in dump trucks or other end-dump containers.

7.3.1 Intermodal Allowable Wastes

The WG may use intermodal containers for soil, gravel, concrete rubble, scrap metal, and building rubble. Sharps liners are recommended for waste streams that contain sharp-edged items or debris prone to damaging liners. The WG *shall* ensure allowable wastes are loaded to meet the following criteria:

- Weight is evenly distributed and not resting against the door.
- Liners are secured around the waste package and not attached to the inside of the intermodal container.
- Waste pieces within container are less than 3 ft in any dimension.
- Clearance of at least 18 inches between the top of the waste and the bottom of the top header brace located near the door end of the container such that waste can exit under the header and through the rear door with clearance to prevent jamming.

- Soils are free of scrap metals, debris, or rocks of a size that could damage the liner or impact clearance.
- Waste is not wedged into any area of the container.
- Waste movement is minimized during transportation.

The RWMC Waste Operations Supervisor reserves the right to bury any intermodal in its entirety that does not off-load successfully.

7.3.2 Intermodal Prohibited Wastes

The following wastes are prohibited from shipping in intermodals that are to be emptied and returned:

- RACM LLW
- MLLW
- PCB waste except for PCB bulk product waste meeting the definition of 40 CFR 761.62(b)(1)
- Fine particulates that could become airborne
- LLW beryllium waste (particulate)

7.4 Package Closure and TIDs

The WG *shall* ensure package closures are designed to withstand the effects of changing temperatures, weather, pressures, and/or vibrations without breaching under normal handling and transport conditions.

The WG *shall* ensure in-process containers:

- are sealed to detect opening or are stored in a secure area to prevent unauthorized intrusion, and
- are protected from the environment to maintain package integrity (e.g., no water intrusion) and prevent deterioration of container until readied for shipment.

Prior to shipment, the WG *shall* ensure each package is closed in accordance with manufacturer's instructions using calibrated equipment, where applicable.

The WG *shall* ensure containers have TIDs. LLW containers may be shipped in a closed conveyance, including Conestogas, with locks and TIDs to satisfy this requirement in lieu of applying TIDs to individual containers. Clips, cold welding, banding, epoxy seals, or sealed bolts may be used in lieu of lead-free seals or wire closures to indicate that the package has remained sealed. The WG ***shall*** ensure TIDs are traceable by a unique number or other unique identification for MLLW and classified hazardous waste containers subject to verification by RWAP as described in Sections 3.1.3.1 or 3.1.3.2. [A.2.1] The WG *shall* provide a listing of the TID identifications with the shipment paperwork . MLLW-verified containers with an RWAP verification label *shall* be identified on the PSDR.

7.5 Package Marking and Labeling

The WG *shall* ensure markings and labels are in English, are durable and will remain attached, are intact, and are readable under expected handling and transport conditions. The WCO or package certifier *shall* ensure label entries, printed or hand-entered, are indelible and legible. The WCO or package certifier *shall* ensure markings and labels are not obscured. The WG *shall* remove or obliterate markings and/or labels that do not accurately represent the packaging or the contents (e.g., legacy transportation markings, former "pending measurement" labels).

7.5.1 DOT Marking/Labeling

As applicable, the WG ***shall*** mark and label packages in compliance with 49 CFR 172, "Subpart D, Marking" and "Subpart E, Labeling."

7.5.2 Other Regulatory Labeling

The WG ***shall*** label packages as specified in the TWAC, Table 3-3, for non-DOT mandated regulatory labeling (e.g., EPA, USDA, and Occupational Safety and Health Administration [OSHA] labeling), as applicable.

7.5.3 NNSS Specific Marking/Labeling

For remote-handled containers or other items with rough surfaces impacting adhesion, it is acceptable for the WG to print and provide the labels with the driver's paperwork in lieu of affixing to the package. Labels may also be attached via laminating and zip-tying.

7.5.3.1 Package Certification Label

The WG *shall* affix a PCL signed by the WCO, AWCO, or package certifier to each package. If the waste is unpackaged bulk or affixing to the package presents ALARA concerns, the WG *shall* submit the required signed PCL(s) with the shipping papers.

7.5.3.2 Bar Code Labels

Bar code labels *shall* be affixed to containers shipped to the NNSS originating from the WG site or approved off-site location. The WG *shall* submit a sample bar code to the RWMC Waste Operations Supervisor at WMINFO@nv.doe.gov prior to the WG's first shipment to ensure that RWMC equipment can be used to read the bar code. The WG *shall* also submit any revisions for approval prior to use.

The WG *shall* affix bar codes as follows:

- Boxes, Cargoes – two (2) bar code labels placed on each package in the middle or near the bottom, and on opposite sides.
- Drums – two (2) bar code labels with one (1) on top of the drum lid and one (1) on the side near the top.

Bar One Information *shall* be in the following sequence:

- Two (2) alpha character generator site-designator codes included in Appendix E. (New WGs *shall* contact the NNSS LWIS Administrator as identified in Appendix A to coordinate assignment of a new generator site-designator code.)
- One (1) alpha character for type of waste:
  - L for LLW.
  - M for MLLW, including classified MLLW.
  - C for non-radioactive classified waste.

  - H for non-radioactive classified hazardous waste.
- Two (2) numeric characters for current fiscal year.
- Three (3) alpha-numeric characters for shipment sequence.

Bar Two is the package number displayed as up to six (6) characters (alpha, numeric, or combination) with no duplication within the shipment.

The WG *shall* verify the bar code against container tracking systems and shipment paperwork. An example bar code and completion instructions are included in Appendix C.

7.5.3.3 NNSS Marking

The WG *shall* clearly mark the package weight in both kilograms and pounds on the side of each waste package either through a label or bar code, or by writing the weight on the side of the waste package. The WG *shall* ensure that markings meet any regulatory requirements that are more restrictive than those specified, such as a larger font.

The WG *shall* mark waste packages having abnormal centers of gravity to clearly indicate the center of gravity.

8.0 Motor Carrier Selection and Driver Qualifications

8.1 Motor Carrier Selection

When selecting a commercial motor carrier for shipments to the NNSS, the WG *shall* use the most-current DOE Motor Carrier Evaluation Program's (MCEP) Evaluated Carriers Performance List (ECPL).

The WG using company vehicles for shipment to the NNSS ***shall*** register with the Federal Motor Carrier Safety Administration (FMCSA) as a private motor carrier in accordance with 49 CFR. Private motor carriers (DOE/NNSA contractors) are reviewed through the DOE Transportation Safety & Operations Compliance Assurance Program.

The WG *shall* document compliance with applicable regulatory requirements, including appropriate financial responsibility for private motor carriers at shipment. The WG *shall* ensure possession of required registrations, permits, and certificates necessary to transport the shipment.

8.1.1 Motor Carrier Performance Monitoring

The WG *shall* perform a motor carrier due diligence review as required by the MCEP on the day of shipment, prior to shipment release. The WG *shall*, at a minimum, document the data checks specified in the latest version of *Guidance for Administering Due Diligence Reviews of NNSS-Bound Truckload Motor Carriers*, available on SharePoint. The WG *shall* maintain a copy of the RWAP day-of-shipment motor carrier review and provide upon request.

When using a private motor carrier, the WG *shall* submit information to the RWAP Manager via email at RWAP@emnv.doe.gov the first week of each month for routinely scheduled shipments or two weeks prior to a non-routine shipment. Private motor carrier information to be provided includes Pipeline Hazardous Materials Safety Administration Hazmat Registration (per 49 CFR 107.601) and proof of financial responsibility (per 49 CFR 387.9). EPA Transporter Identification Number (per 40 CFR 263.11) and FMCSA Hazardous Material Safety Permit (per 49 CFR 385.403) *shall* be provided, as applicable, for the waste being transported by the private motor carrier.

8.1.2 Reporting of Nonconforming Motor Carrier Performance

The WG *shall* notify the RWAP Manager via email at RWAP@emnv.doe.gov if they determine that a commercial or private motor carrier's performance has violated federal, state, or local transportation safety regulations. The RWAP Manager may request additional information from the WG regarding continued use of the carrier and/or corrective actions taken.

8.2 Driver Qualification

The WG *shall* ensure that drivers used for shipments to the NNSS meet the requirements in this section.

The WG *shall* ensure the driver(s) of transport vehicles and escort/pilot car(s) (as applicable) possess the appropriate driver's license, HAZMAT/equipment endorsements, and DOE/NNSA security level to transport the waste and to access the NNSS. The WG *shall* maintain confirmation documentation.

The WG *shall* comply with the NNSS Access Requirements for Radioactive Waste Drivers available on SharePoint.

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9.0 Shipment Requirements

When deemed necessary by DOE EM Nevada Program or other federal entity, the WG *shall* generate transportation plans in accordance with the requirements outlined in DOE O 460.2B, *Departmental Materials Transportation Management*, "Attachment 1, Contractor Requirements Document, 3. Shipment Planning for Certain Hazardous Materials."

9.1 Radiological Contamination and Dose Control

The WG ***shall*** ensure and document that external contamination levels for waste packages, unpackaged bulk items, and transport vehicles meet the total (fixed plus removable) and removable contamination release limits specified in 10 CFR 835, Appendix D per the site's nuclides.

9.1.1 Dose Limits for Intermodals To Be Emptied

The WG ***shall*** ensure that dose rates are <5 mrem/hr on contact of the loaded intermodal and <5 mrem/hr @ 30 cm from the waste.

9.1.2 Dose Limits for Packages Shipped for Direct Disposal

The WG ***shall*** determine the dose rate for each container on contact, at 30 cm and at 1 m, and report in mrem/hr on the PSDR.

9.1.3 Dose Control via Lead Shielding

Except when loading lead into a macroencapsulation package assigned Waste Code D008 on the UHWM, WGs adding lead shielding (radioactively contaminated or uncontaminated) to a waste container *shall* maintain the following:

- Documentation demonstrating that standard packaging without lead shielding would not reduce the exposure rate to <0.005 rem/hr (5 mrem/hr) @ 30 cm, and the shielding is necessary for radiation protection.
- Documentation for each container including calculations or dose rate surveys demonstrating the amount of lead (thickness/quantity) is not excessive for each container. Justification for using the appropriate amount of lead shielding can be demonstrated by a

detailed dose rate survey that shows the shielded dose rate >0.005 rem/hr (5 mrem/hr) @ 30 cm from the waste container/package.

The Lead Shielding Disposal Review Request or equivalent can be used to document compliance and is available on SharePoint. The WG *shall* provide documentation to the RWAP Manager via SharePoint at least fourteen (14) days in advance of shipment. The RWAP Manager will issue a letter to the WCO and copy the RWMC Waste Operations Supervisor when the lead-shielding evaluation is completed.

The requirements of this section do not apply to containers that are manufactured with lead lining identified and approved in a WP.

9.1.4 Dose Control ALARA Planning

The WG *shall* complete an NNSS ALARA Planning Form for Elevated Dose Shipments for any of the following:

- Shipments with one (1) or more containers with dose rates >100 mrem/hr @ 30 cm
- Shipments with intermodal containers to be emptied and returned
- Shipments with Type A or B shipping casks to be emptied and returned
- Shipment with any other container requiring the removal of an inner disposal container from an outer container regardless of dose rate
- Shipment with removable shielding used to meet DOT dose rates while in transit

The form *shall* be completed with the information for the container with the highest dose rate and/or contamination levels for a given shipment. The NNSS ALARA Planning Form for Elevated Dose Shipments is available on SharePoint. The WG *shall* return completed forms and surveys to WMINFO@nv.doe.gov. In addition to the spreadsheet, the WG *shall* provide approved radiological surveys for all packages >100 mrem/hr @ 30 cm either in advance to WMINFO@nv.doe.gov or with shipment paperwork.

9.2 Multiple Shipment Conveyances

The WG *shall* notify the RWMC Waste Operations Supervisor via email to WMINFO@nv.doe.gov prior to release of a closed van shipment of either of the following:

- Conveyance with different shipment numbers from a single generator
- Conveyance with different shipments from more than one (1) generator

The WG is requested to provide schematics or diagrams depicting the packages associated with different shipment numbers and/or different shipments.

9.3 Load Securement and Protection

9.3.1 Palletizing and Banding

The WG *shall* palletize drums. Any group of two (2) or more drums are required to be banded with the exception of drums shipped within casks, which are not to be banded to other drums or the pallet. The banding *shall* securely hold the drums to the pallet; typical banding configurations include two (2) vertical and two (2) horizontal bands around the drums. The WG *shall* ensure the pallets are designed to support container weights during routine handling and transport. Drums should be oriented such that labeling and markings are visible when off-loaded. Drums being shipped solely within the NNSS boundaries (exclusively DOE/DoD-controlled roads) are not subject to the requirements of this section.

9.3.2 Blocking and Bracing

The WG ***shall*** ensure that cargo, including waste packages, is secured, blocked, and braced in compliance with the DOT requirements of 49 CFR 177.834, "General Requirements"; and 49 CFR 177.842, "Class 7 (Radioactive) Materials"; with 49 CFR 393, "Subpart I, Protection Against Shifting and Falling Cargo"; and with applicable manufacturer's instructions so they will not shift during normal transport conditions.

The WG *shall* identify any blocking and bracing items to be returned in accordance with Section 10.2.5.

9.3.3 Cover Requirements

The WG *shall* ensure that drums on flatbeds are tarped or otherwise shielded from the weather during transport. Conestoga and curtain-side vans are considered closed vehicles and do not require tarping. Drums being shipped solely within the NNSS boundaries (exclusively DOE/DoD-controlled roads) are not subject to the requirements of this section.

9.4 Shipment Placarding

The WG ***shall*** placard conveyances in compliance with the DOT regulations of 49 CFR 172.500. Placards on intermodal containers *shall* be removed by the transporter after waste is unloaded at the NNSS and before the conveyance leaves the site.

9.5 Shipment Security

The WG *shall* attach TIDs (e.g., seals or non-lead wires) or locks to the trailer's door prior to shipment release. The WG *shall* either provide keys or lock combinations, or make other arrangements with the RWMC Waste Operations Supervisor for accessing trailer contents. If no arrangements have been made, locks may be cut off upon receipt. The TIDs or locks *shall* be applied to the trailer doors, even if the packages inside the trailer have TIDs. If TIDs are used, the WG *shall* enter the trailer TID number(s) on the shipping papers or on an attachment to the shipping papers in a location that is readily identifiable for verification.

TIDs are not required for soft-sided trailers where the door cannot be sufficiently secured or for shipments made solely within the NNSS boundaries (exclusively DOE/DoD-controlled roads).

9.6 Shipments with Special Receipt Coordination

Shipments requiring special receipt coordination are identified on Table 9-1. The table also identified associated notification requirements.

Coordination may entail notification of stakeholders, use of specialty equipment, development of job-specific Radiological Work Plans (RWP), or other arrangements. The WG may incur additional costs for these shipments as noted in Section 13.3.

Table 9-1
Shipments Requiring Special Receipt Coordination

Description	Triggering Criteria	Advanced Paperwork Submission Requirements (days are in advance of shipment release to NNSS) [1]	Paperwork Recipient
Very High Dose Rate Shipments	One (1) or more inner containers with a dose rate ≥2.5 R/hr and <5.0 R/hr @ 30 cm	WP – Ninety (90) days (if RWMC-approved user for cask) [2] WP – One hundred and eighty (180) days (if RWMC must apply for approval as cask user) [2] Preliminary NNSS ALARA Planning Form for Elevated Dose Shipments based on conservative estimates or actuals – Sixty (60) days Final NNSS ALARA Planning Form for Elevated Dose Shipments based on actuals – Prior to release of shipment [3]	RWAP@emnv.doe.gov (WP only) WMINFO@nv.doe.gov (NNSS ALARA Planning Form)
Very High Dose Rate Shipments Requiring Job-Specific RWP	One (1) or more inner containers with a dose rate ≥5.0 R/hr @ 30 cm	WP – Ninety (90) days (if RWMC-approved user for cask) [2] WP – One hundred and eighty (180) days (if RWMC must apply for approval as cask user) [2] Preliminary NNSS ALARA Planning Form for Elevated Dose Shipments based on conservative estimates or actuals – Sixty (60) days Final NNSS ALARA Planning Form for Elevated Dose Shipments based on actuals – Prior to release of shipment [3]	RWAP@emnv.doe.gov (WP only) WMINFO@nv.doe.gov (NNSS ALARA Planning Form)
Highway Route Controlled Quantity Shipments	Any shipment meeting the DOT definition of 49 CFR 173.403	WP – Ninety (90) days Security Plan per 49 CFR 172.800(b) – Ten (10) days Written Route Plan per 49 CFR 397.101(d) – Ten (10) days	RWAP@emnv.doe.gov (WP, Security Plan, Transportation Plan)
Overweight/ Over-Dimensional Shipments	Exceeds 80,000 lb or Height exceeds 14 ft or Length exceeds 70 ft or Width exceeds 8 ft 6 inches, or 10 ft of front or rear overhang	WP – Ninety (90) days Permit Requirements in Section 11.2.2 – Varies	RWAP@emnv.doe.gov (WP) NDOT (Permit applications)

Table 9-1
Shipments Requiring Special Receipt Coordination

Description	Triggering Criteria	Advanced Paperwork Submission Requirements (days are in advance of shipment release to NNSS) [1]	Paperwork Recipient
Superload Shipments	Exceeds 500,000 lb or Height exceeds 18 ft, or Length exceeds 200 ft or Width exceeds 17 ft for two (2)-lane road Width exceeds 19 ft for four (4)-lane road	WP – Ninety (90) days Preliminary Transportation Plan – Thirty (30) days Final Transportation Plan – Ten (10) days Lift Plan – Forty-five (45) days Photos, other information that may aid in unloading – No later than day of shipment Permit Requirements in Section 11.2.2	RWAP@emnv.doe.gov (WP, Preliminary and Final Transportation Plans) WMINFO@nv.doe.gov (Lift Plan, Photos)
International Shipments or Shipments Crossing International Space	Any consignment originating outside the contiguous U.S.	WP – One hundred and eighty (180) days Transportation Plan – Ninety (90) days Copy of shipping documents – At shipment release	RWAP@emnv.doe.gov (WP, Transportation Plan) WMINFO@nv.doe.gov (Copy of Shipping Papers)
Transload Shipments	Any shipment that will be transferred from the original conveyance prior to delivery at the NNSS (e.g., train to truck, air to truck)	WP – Ninety (90) days Transportation Plan – Thirty (30) days	RWAP@emnv.doe.gov (WP, Transportation Plan)
Low Ground Clearance Shipments	Double-drop decks or removable gooseneck trailers	Trailer length, deck height, ground clearance and other relevant information – Thirty (30) days	WMINFO@nv.doe.gov
Top-Heavy Loads	Equipment that must be loaded in a top-heavy configuration	Load Plan – Seven (7) days Photos, other information that may aid in unloading – No later than day of the shipment	WMINFO@nv.doe.gov

[1] A given shipment may meet more than one (1) criterion listed on the table.

[2] A list of RWMC-approved user casks is available from the RWMC Waste Operations Supervisor.

[3] If the final form reflects dose rates increasing of ten (10) percent or more than the preliminary form, the RWMC Waste Operations Supervisor may delay shipment receipt and unloading. WG are requested to be conservative in completing the preliminary form.

10.0 Shipment Documentation Requirements

The WG *shall* promptly provide updates to shipping papers or other documentation described in this section to the RWMC Waste Operations Supervisor post-shipment via email to WMINFO@nv.doe.gov.

10.1 Required Shipping Papers

The WG ***shall*** submit completed shipping papers (Table 10-1) with shipper's certification, as required by 49 CFR 172.200, "Subpart C, Shipping Papers – Applicability" for hazardous materials regulated by DOT. The WG ***shall*** provide shipping papers as described in Table 10-1 or as described in Appendix G if shipping classified matter in accordance with the Classified Matter Interim Direction.

Table 10-1
Shipping Papers

Shipping Paper Name/Number	Waste Type
Bill of Lading or NRC-540/541 Uniform Low-Level Radioactive Waste Manifest	Non-regulated waste (Bill of Lading only) Low-level radioactive waste (LLW) LLW with RACM and/or PCB bulk product
Waste Containers shipped solely within the NNSS boundaries (exclusively DOE/DoD-controlled roads) regardless of waste type	HAZTRAK-generated NNSS On-site Transfer form
Uniform Hazardous Waste Manifest (UHWM)	MLLW based on EPA Hazardous Waste Codes MLLW based on State Hazardous Waste Codes Non-radioactive classified hazardous waste PCB Remediation Waste PCB Bulk Product greater than 10 µg/L leachable

The WG *shall* enter the words "Dedicated Service" or language with similar meaning on the shipping papers in a clearly visible location; or one (1) basic entry denoting "Exclusive Use" or "Exclusive Use Shipment" when shipping under 49 CFR 172.203(d)(9)(i) or (ii). It is suggested that the shipping papers include a copy of the HAZTRAK Entry Confirmation.

The WG *shall* only use a UHWM when required under federal or state regulations. The WG ***shall*** provide a signed LDR Certification Statement in accordance with the requirements in 40 CFR 268.7 for the following:

- MLLW
- Non-radioactive classified hazardous waste
- Whenever the WP has been revised, changing the LDR certification

The WG ***shall*** provide the LDR Certification Statement with each shipment as required under 40 CFR 268.7. Section 10.2.2 lists the requirement for a certification.

10.1.1 Consignment Instructions

Unless otherwise provided by contract with DOE/NNSA or between the commercial TSDF and its motor carrier, generators *shall* ensure that commercial bills of lading and other commercial documents covering non-classified shipments made to the Area 5 RWMC on behalf of DOE consign shipments as described below. Abbreviations are acceptable to the extent they reasonably identify the entities involved in the shipments. Shipments consigned to NNSS Area 3 will replace "Area 5 RWMC" with "Area 3 RWMS."

U.S. National Nuclear Security Administration in care of
(Current NNSS M&O contractor) Waste Management
Nevada National Security Sites – Area 5 RWMC
Attn: Waste Operations Supervisor (optional)
Mercury, NV 89023

10.1.1.1 Classified Shipments

Shipments containing classified waste and/or matter shipped to the Area 5 RWMC *shall* be consigned to the address listed in the current Safeguards and Security Information Management System (SSIMS). The address can be obtained from the WG's security department. If the WG does not have a DOE/NNSA security department, contact the NNSS Senior Security Specialist identified in Appendix A.

10.1.2 Nevada Originating Waste Deliveries to Area 3 RWMS

The WG *shall* arrange delivery with the RWMC Waste Operations Supervisor a minimum of one hundred and eighty (180) days in advance for wastes originating in the State of Nevada to be disposed in Area 3.

10.2 Additional Required Paperwork

10.2.1 Package Shipment Disposal Request

The WG *shall* complete and submit a PSDR .txt file no later than one (1) NNSS working day in advance of the planned shipment arrival date. If the shipment will be arriving on Monday, the PSDR .txt file for the shipment *shall* be sent prior to 1400 on the Thursday prior to the shipment arriving. Contact the RWMC Waste Operations Supervisor for any exceptions needed. The WG *shall* submit the original completed and signed PSDR, or equivalent original, with the shipping papers. The WG may request a confirmation email for successful uploads.

10.2.2 Shipment Certification Statements

For waste shipments (classified or non-classified), the WG *shall* complete and submit a Shipment Waste Certification Statement, available on SharePoint, with shipments.

10.2.3 NNSS Advanced Shipment Notification

The WG *shall* complete and submit an NNSS Advance Shipment Notification, available on SharePoint, to the RWMC Waste Operations Supervisor via email to WMINFO@nv.doe.gov for each inbound shipment of classified waste requiring protection from visual observation.

10.2.4 Nuclear Material Transaction Reporting

The WG ***shall*** submit a "Nuclear Material Transaction Report" (DOE/NRC Form 741) electronically to the DOE Nuclear Materials Management and Safeguards System (NMMSS). The WG *shall* list the applicable NNSS shipment numbers on Form 741 and provide a copy with the waste shipment. The WG *shall* provide Termination of Safeguards documentation for wastes with special nuclear material attractiveness Level D and above regardless of category based on

quantity per DOE O 474.2A, *Nuclear Material Control and Accountability,* with the waste shipment.

When shipping Category II or greater quantities of special nuclear material for disposal, the WG ***shall*** develop Termination of Safeguards documentation in accordance with DOE O 474.2A. The WG ***shall*** ensure that a security analysis is completed and concurrence is obtained from the NNSS Senior Security Specialist (see Appendix A) for WPs including Category II (or greater) quantities of special nuclear material.

10.2.5 Equipment List

The WG *shall* provide an inventory list of non-waste items such as blocking/bracing equipment or removable shielding components and their ultimate disposition to the RWMC Waste Operations Supervisor via email to WMINFO@nv.doe.gov upon release of the shipment from the WG's site. The WG *shall* provide the inventory and shipping documents for any returned equipment/material with the shipment.

Note: Equipment constructed of wood or other porous materials may not be releasable.

10.2.6 Return Container Instructions

The RWMC releases containers as "Empty Class 7" radioactive packaging in accordance with 49 CFR 173.428. The WG *shall* identify on the WP whether a more restrictive survey release criteria must be met.

11.0 Shipment Scheduling and Release

11.1 HAZTRAK

The WG *shall* enter proposed shipments into HAZTRAK up to thirty (30) days prior to the actual ship date. Required information can be found in the current version of the "HAZTRAK Users Guide for Waste Generators" in HAZTRAK.

Note: The WG ***shall*** not enter classified information into HAZTRAK.

The WG *shall* enter pre-notification information no later than 1500 hrs NNSS local time, one (1) NNSS working day prior to the scheduled shipment arrival date at the NNSS. If the WG is unable to enter or update information in HAZTRAK, a completed NNSS Advance Shipment Notification *shall* be submitted by email to WMINFO@nv.doe.gov. For shipments arriving on a Monday, the WG *shall* contact the RWMC Waste Operations Supervisor before 1400 hours on the prior Thursday if the WG is unable to enter HAZTRAK information.

The WG *shall* notify the RWMC Waste Operations Supervisor via email to WMINFO@nv.doe.gov or by phone if a shipment's scheduled arrival date changes. The WG *shall* enter the new arrival date in HAZTRAK at the earliest opportunity prior to arrival.

11.2 Shipment Routing

11.2.1 Inbound NNSS Shipments

The WG *shall* review the route selected by the driver prior to shipment release to identify any concerns with documented agreements with corridor states and/or municipalities prior to release.

The WG is requested to advise the driver to use interstate or limited access divided highways, and to avoid high-density urban areas, especially where circumferential interstate highways are available. Information on accident rates, time in transit, population density, construction activities, and time of day *shall* be considered when determining radiological risk, as required by 49 CFR 397.101(a).

The WG *shall* ensure that the route selected does not traverse the Hoover Dam Bypass Bridge (Mike O'Callaghan – Pat Tillman Memorial Bridge) or central Las Vegas, including the Las Vegas Beltway (I-215) and the Spaghetti Bowl (I-15/U.S.-95 Interchange). This restriction applies to all shipments, including non-DOT regulated and non-placarded waste/material originating outside the Las Vegas valley. Waste originating in North Las Vegas *shall* require a deviation request.

The WG *shall* ensure that waste is not transported on routes identified on the Waste Generator Inbound Shipping Calendar provided on SharePoint. RWAP will provide alerts listing blackout dates as they become available.

The WG *shall* ensure that the driver is aware that if directed to deviate from the designated route by first responder/law enforcement personnel, they are to make a concerted effort to return to their designated route as soon as it is safe to do so. The WG *shall* ensure that the driver is briefed on the notification process (see Table 12-1) and to record any deviations on the Drivers Route/Shipment Information Questionnaire (also known as the "Driver's Survey").

11.2.2 Nevada Permitting

The WG *shall* ensure that the carrier, or the carrier's permitting service, verifies overweight/over-dimension permits, following the current NNSS routing protocols (Section 11.2.1). NNSS consigned shipments >14 ft 6 inches in height cannot be routed through U.S. 95 Southbound Exit 136. The WG *shall* ensure that the carrier is notified that Nevada Department of Transportation (NDOT) Over-Dimensional Vehicle Permits (OVP) personnel are to be provided with the following language: "WASTE/MATERIAL DESTINED FOR DISPOSAL AT THE NNSS RADIOACTIVE WASTE MANAGEMENT SITE" when requesting an over-dimensional permit. The required NNSS language *shall* be recorded in the "Description of Load" field on the hard copy or electronic requests. If an issued NDOT OVP route is suspected as prohibited by the NNSSWAC, the WG *shall* contact the RWAP Manager or RWMC Waste Operations Supervisor prior to the conveyance entering the state of Nevada.

11.2.3 Return Shipments

Shipments of empty packaging(s) leaving the NNSS that are prepared and shipped under the definition of an "Empty Class 7 (radioactive) materials packaging" per 49 CFR 173.428 and that do not require a hazardous material shipping paper are not subject to waste routing restrictions when being returned to the WG.

11.3 Required Driver Supplemental Information

The WG *shall* provide to the driver—in addition to Exclusive Use Instructions, Driver's Instructions, and/or Dedicated Service Instructions—the following information provided on SharePoint:

- NNSS Access Requirements for Radioactive Waste Drivers (available on SharePoint)
- NNSS Prohibited Items List
- RWAP-FR-035 R3a, Waste Generator Inbound Shipping Calendar (required if using a southern route and a driver briefing concerning the use of CA-127 and/or NV-160 has not been documented in the shipping file)
- NNSS Drivers Route/Shipment Information Questionnaire
- List of required NNSS OCC notifications (to include whom to notify)

The WG ***shall*** notify the driver they are required under *Nevada Administrative Code* 459.9865 to notify the Nevada State Police for shipments of radioactive waste originating from sources other than DOE or approved DoD sites four (4) hours prior to entering Nevada.

11.4 Driver's Responsibilities

The WG *shall* ensure that the driver (including escort drivers, as applicable) is briefed on the following responsibilities:

- Understanding the WG processes/instructions for following the commands/instructions of first responder/law enforcement, including requests to remove TIDs or locks on trailers
- Periodic waste inspection per DOT requirements, and any required by the WG
- Registering in accordance with Section 11.5.2

- Following specific instructions for behavior while at the NNSS, including any special alert instructions, and following safety and technical instructions of RWMC personnel
- The requirement to complete the NNSS Drivers Route/Shipment Information Questionnaire
- Making notifications as outlined on Table 12-1 in the event of an in-transit event

Driver actions or inactions may result in a finding issued to the WG, up to and including WCP suspension.

11.5 Driver Delivery

11.5.1 Standard Scheduling

The WG *shall* schedule shipments for delivery in accordance with Table 11-1.

Table 11-1
NNSS RWMC Pacific Time Hours of Operations

Shipment Types	Monday–Thursday [1]	Friday–Sunday
Standard and Oversized Shipments	0700 – 1400 [2, 3]	No acceptance
Shipments Containing Only H-3 (tritium)	0700 – 1200	No acceptance

[1] Except holidays.

[2] Tractor-trailers arriving between 0700 and 1400 will be allowed to remain at the RWMC until their delivery is complete.

[3] Shipments may be off-loaded from 1400 to 1600 at the discretion of the RWMC Waste Operations Supervisor.

The RWMC Waste Operations Supervisor may impose schedule limitations.

The order of processing and unloading shipments will be at the discretion of the RWMC Waste Operations Supervisor based on the support (i.e., personnel and equipment) needed for each shipment. The WG *shall* notify the RWMC Waste Operations Supervisor in advance of shipment arrival via email to WMINFO@nv.doe.gov of any needed expedited processing.

The RWMC Waste Operations Supervisor may extend operating hours or days (e.g., Fridays) and will provide notifications of shipment types to be reviewed during these extensions. Requests for off-loading that require overtime will be at the WG's expense.

11.5.2 Arrival Registration

Drivers without an HSPD-12 badge or an NNSS-issued site badge *shall* stop at the NNSS main gate badge office. Badged drivers without a copy of HAZTRAK entry confirmation *shall* stop at the NNSS main gate badge office. Drivers with an HSPD-12 or an NNSS site badge and a HAZTRAK entry confirmation may proceed directly to the NNSS main gate for entry.

The WG or driver *shall* obtain approval from the RWMC Waste Operations Supervisor to stage loaded inbound trailers without power units outside the NNSS main gate, at the Area 3 RWMS, or at the Area 5 RWMC, prior to delivery. Shipments may be staged within the Desert Rock drop yard if arrangements have been made with the RWMC Waste Operations Supervisor.

11.5.3 Shipment Acceptance

The driver *shall* not remove trailers and/or other equipment until cleared for release. The RWMC Waste Operations Supervisor will notify the WG and the driver if equipment release is delayed.

The driver *shall* accurately complete the NNSS Drivers Route/Shipment Information Questionnaire prior to leaving the RWMC.

The driver *shall* obtain approval from the RWMC Waste Operations Supervisor prior to staging empty trailers inside and/or outside the NNSS main gate.

11.5.4 Disposition of Discrepancies

The WG *shall* respond promptly to information requests regarding discrepancies noted upon shipment.

If questions arise during RTR performed at the RWMC, the WG *shall* respond to requests for information by completing an NNSS Real Time Radiography (RTR) Verification Review.

The WG *shall* be responsible for dispositioning containers or items deemed to be noncompliant and ineligible for disposal. The WG *shall* coordinate transportation arrangements and complete necessary manifest and/or other shipping paperwork to allow compliant transport back to the WG site or an alternate facility designated by the WG. The WG *shall* schedule arrangements

with the RWMC Waste Operations Supervisor to ensure support resources are available as required.

11.5.5 Certificates of Disposal

The RWMC Waste Operations Supervisor will provide a certificate of disposal as required by 40 CFR 761.218 for shipments of PCB remediation waste >50 ppm. The WG may provide a certificate of disposal for signature and return with other waste shipment(s) if needed. A certificate of disposal example is available on SharePoint.

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12.0 Transit Notifications

The WG and/or motor carrier/driver *shall* make required notifications in accordance with Table 12-1.

Notifications *shall* apply to shipments while in transit and while located at a transfer yard.

The WG *shall* obtain the signature of motor carrier/driver acknowledging understanding of the notification requirements. The WG *shall* determine who within their organization has the responsibility for providing notifications to the NNSS OCC within the specified time frame.

In addition to the in-transit incident notifications listed in Table 12-1, commercial TSDFs *shall* notify the originating DOE/NNSA site of any in-transit incidents involving their waste.

Table 12-1
Transit Incident/Accident/Discrepancy Notifications [1]

No.	Issue/Incident	Occurs	Provided By	Provided To	Via	Timeframe
1	An NNSSWAC noncompliance is identified.	In transit	WCO	RWAP Manager	Phone or email	As soon as possible
2	An incident, transportation delay, or emergency situation that does not meet the criteria identified in 4 through 9 of this table.					
3	A noncompliance, regulatory violation, or inadequate performance by the motor carrier.	Anytime				
4	An anticipated delay in arrival time at the NNSS main gate after 1200 Pacific Time on scheduled day of arrival, or later. [2]	In transit	WG or carrier	NNSS OCC	Phone	Within one (1) hour of occurrence or determination
5	Shipment involved in an accident (DOT or non-DOT recordable). [2]					
6	Moving violation issued by law enforcement. [2]					

Table 12-1
Transit Incident/Accident/Discrepancy Notifications [1]

No.	Issue/Incident	Occurs	Provided By	Provided To	Via	Timeframe
7	The detection of radioactive contamination on the package(s) or conveyance; or suspect detection during transit. [2]	In transit	WG or carrier	NNSS OCC	Phone	Within one (1) hour of occurrence or determination
8	A significant load shift. [2]					
9	The shipment deviated from the agreed-upon route while traveling in Nevada. [3]					
10	Discrepancies discovered during waste receipt, verification, and/or disposal. [4]	At RWMC	RWMC Waste Operations Supervisor	Log Alert Distribution and WG	RWMC Discrepancy Log and Email and/or Phone Contact with WCO	No later than close of business on day of discovery

[1] Notifications listed are required for NNSS shipments and are in addition to any required by DOE directives; regulations; or the WG's permits, authorizations, licenses or other contractual requirements.

[2] Minimum required information: description of the incident/event, shipment number, driver name, carrier name, location. Other information to be provided as applicable and/or available: status of driver, status of packages and transportation equipment; any interactions with public, first responders, or law enforcement.

[3] Provide cause of deviation (e.g., directed by law enforcement/first responder, driver error) and route taken. If delivery anticipated to the NNSS within two (2) hours, driver may report upon delivery in lieu of calling the NNSS OCC.

[4] Discrepancies pertaining to the shipments package(s), documentation, or conveyance are discussed in Section 3.2.4.

13.0 Shipping Forecasting, Funding, and Additional Reporting

13.1 Bi-monthly Shipment Schedule

The WG *shall* provide the NNSS WG Coordinator a "Bi-monthly Shipment Schedule" by the last Monday of each month with the following information for the next two (2) months:

- Estimated number of shipments and arrival dates
- WP number(s) to be shipped
- Type and quantity of containers/packaging
- Estimated waste volumes in cubic feet (ft^3) rounded up to nearest whole value (e.g., 12.1 rounded to 13), by shipment and totals
- Special handling requirements, if applicable

"Bi-monthly Shipment Schedules" *shall* be emailed to WMForecast@nv.doe.gov.

13.2 NNSS Requested Waste Forecasts

The WG *shall* provide the LLW/MLLW Fiscal Year Preliminary/Midyear Update Waste Forecast Request and any other waste forecast requests to WMForecast@nv.doe.gov unless otherwise instructed. The WG *shall* record volume in ft^3 rounded up to the nearest whole number (e.g., 12.1 rounded to 13).

13.3 Funding

The WG *shall* ensure that their waste has funding prior to shipment. The WG *shall* record the funding source of the package on the PSDR. Funding sources are as follows:

1) DOE/NNSA funding offices
    a. Defense Programs (DP)
    b. Environmental Management (EM)
    c. Naval Reactors (NR)
    d. Office of Science (SC)
    e. Nuclear Nonproliferation (NN)
    f. Nuclear Energy (NE)

2) Strategic Partnership Program (SPP)
    a. Report as OTHER (OT) and in adjoining comment field:
        i. Non-federal (e.g., Nuclear Fuel Services [NFS]) and agreement number in adjoining comment field OR
        ii. Federal (e.g., Hill Air Force Base [HAFB]) and Military Interdepartmental Purchase Request (MIPR)

3) Packages received from either DOE/NNSA-funded or SPP projects that warrant Charges Above Baseline Services (e.g., recovery costs for crane rental, unique disposal cell)
    a. Report as OTHER (OT) and
    b. Agreement number or MIPR designation, if applicable

The WG may contact the DOE EM Nevada Deputy Program Manager, Operations for more information regarding proper funding arrangements.

13.4 Toxic Release Inventory Reporting

WGs *shall* provide Toxic Release Inventory data upon request from the NNSS regarding shipments made to the site.

14.0 References

Note: References are current as of date of publication. WGs should refer to the most current documents.

Code of Federal Regulations

- 10 CFR, "Energy."
- 10 CFR 61, "Licensing Requirements for Land Disposal of Radioactive Waste."
- 10 CFR 71, "Packaging and Transportation of Radioactive Material."
- 10 CFR 830.122, "Quality Assurance Criteria."
- 10 CFR 835, "Appendix D, Surface Contamination Values."
- 40 CFR, "Protection of the Environment."
- 40 CFR 191, "Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes."
- 40 CFR 260.10, "Definitions."
- 40 CFR 261, Subpart C, "Characteristics of Hazardous Waste."
- 40 CFR 263.11, "Service of Papers."
- 40 CFR 268.7, "Testing, Tracking, and Recordkeeping Requirements for Generators, Reverse Distributors, Treaters, and Disposal Facilities."
- 40 CFR 268.40, "Applicability of Treatment Standards."
- 40 CFR 268.42, "Treatment Standards Expressed as Specified Technologies."
- 40 CFR 268.45, "Treatment Standards for Hazardous Debris."
- 40 CFR 761, "Polychlorinated Biphenyls (PCBs)."
- 40 CFR 761, "Subpart R—Sampling Non-Liquid, Non-Metal PCB Bulk Product Waste for Purposes of Characterization for PCB Disposal in Accordance with § 761.62, and Sampling PCB Remediation Waste Destined for Off-Site Disposal, in Accordance with § 761.61."

- 40 CFR 761.62, “Disposal of PCB Bulk Product Waste.”
- 40 CFR 761.218, “Certificate of Disposal.”
- 41 CFR 109-1.53, “Management of High Risk Personal Property.”
- 49 CFR, “Transportation.”
- 49 CFR 107.601, “Applicability.”
- 49 CFR 171.15, “Immediate Notice of Certain Hazardous Materials Incidents.”
- 49 CFR 172, “Subpart D, Marking.”
- 49 CFR 172, “Subpart E, Labeling.”
- 49 CFR 172.200, “Subpart C, Shipping Papers – Applicability.”
- 49 CFR 172.203, “Subpart C, Shipping Papers – Additional Description Requirements.”
- 49 CFR 172.500, “Applicability of Placarding Requirements.”
- 49 CFR 172.800, “Subpart I, Safety and Security Plans – Purpose and Applicability.”
- 49 CFR 173.403, “Subpart I, Class 7 (Radioactive) Materials – Definitions.”
- 49 CFR 173.410, “Subpart I, Class 7 (Radioactive) Materials – General Design Requirements.”
- 49 CFR 173.411, “Subpart I, Class 7 (Radioactive) Materials – Industrial Packages.”
- 49 CFR 173.428, “Subpart I, Class 7 (Radioactive) Materials – Empty Class 7 (Radioactive) Materials Packaging.”
- 49 CFR 173.435, “Table of A_1 and A_2 Values for Radionuclides.”
- 49 CFR 177.834, “General Requirements.”
- 49 CFR 177.842, “Class 7 (Radioactive) Materials.”
- 49 CFR 385.403, “Who Must Hold a Safety Permit?”
- 49 CFR 387.9, “Financial Responsibility, Minimum Levels.”
- 49 CFR 390.5, “Definitions.”

- 49 CFR 393, "Subpart I, Protection Against Shifting and Falling Cargo."

- 49 CFR 397.101, "Requirements for Motor Carriers and Drivers."

DOE and NNSA Directives Policy Letters, Plans, and Standards

- *Departmental Materials Transportation Management*, DOE Order 460.2B. Washington, DC: Office of Environmental Management.

- *Hazardous Materials Packaging and Transportation Safety,* DOE Order 460.1D, Change 1. Washington, DC: Office of Environmental Management.

- *Hoisting and Rigging*, DOE-STD-1090. Washington, DC: Office of Environmental, Health, Safety, and Security.

- *Implementation of Department of Energy Oversight Policy*, DOE Order 226.1B, Change 1. Washington DC: Office of Health, Safety, and Security.

- *NNSA Classified Matter High-Risk Personal Property Management and Disposition Policy – Interim Guidance Letter*, January 19, 2023. Washington, DC: NNSA Office of Environment, Safety, and Health.

- *Nuclear Material Control and Accountability,* DOE Order 474.2A, Change 4. Washington, DC: Office of Environment, Health, Safety, and Security.

- *Quality Assurance,* DOE Order 414.1D, Change 2. Washington, DC: Office of Environmental, Health, Safety, and Security.

- *Personal Property,* DOE Guide 580.1-1A, Change 1. Washington, DC: Office of Management.

- *Radioactive Waste Management,* DOE Order 435.1, Change 2. Washington, DC: Office of Environmental Management.

- *Radioactive Waste Management Manual,* DOE Manual 435.1-1, Change 3. Washington, DC: Office of Environmental Management.

- *Safeguards and Security Program*, DOE Order 470.4B, Change 3. Washington, DC: Office of Environment, Health, Safety and Security.

Acts, Codes, and Permits

- *Nevada Administrative Code*. 2022. NAC 459.9865, "Provision of Notice before Transportation of Radioactive Waste." Carson City, NV.

- Nevada Division of Environmental Protection, Bureau of Federal Facilities. 2021. *Solid Waste Disposal Site Permit Class III,* SW 532, Rev. 5. 9 July. Las Vegas, NV.

- Nevada Division of Environmental Protection, Bureau of Federal Facilities. 2023. *Nevada Division of Environmental Protection RCRA Permit for a Hazardous Waste Management Facility*, Permit Number NEV HW0101, Rev. 7. 4 April. Las Vegas, NV.

- *United States Code*. 2018. Title 42 USC 2011 et seq., "Atomic Energy Act of 1954," as amended. Washington, DC: U.S. Government Printing Office.

- *United States Code.* 2018. Title 42 USC 9601 et seq., "Comprehensive Environmental Response, Compensation, and Liability Act of 1980," as amended. Washington, DC: U.S. Government Printing Office.

- *United States Code*. 2018. Title 42 USC 6901 et seq., "Resource Conservation and Recovery Act of 1976," as amended. Washington, DC: U.S. Government Printing Office.

- *United States Statutes at Large.* 1988. "Price-Anderson Amendments Act of 1988," Public Law 100-408. Statutes at Large 102: pp. 1069−1085. Washington, DC: U.S. Government Printing Office.

Other Resources and Documents

- American National Standards Institute. 1986. *Truckload Quantities of Radioactive Materials – Carrier and Shipper Responsibilities and Emergency Response Procedures for Highway Transportation Accidents*, ANSI N14.27. New York, NY: The Institute of Electrical and Electronics Engineers, Inc.

- Navarro. 2018. "Guidance for Administering Due Diligence Reviews of NNSS-Bound Truckload Motor Carriers," Log No. 2018-034. Las Vegas, NV.

- Navarro. 2018. "HAZTRAK Users Guide for Waste Generators," Log No. 2018-033. Las Vegas, NV.

- Navarro. 2023. "Radioactive Waste Acceptance Program: Procedure for Eligibility Determination for NNSS Disposal," RWAP-1802, Rev. 1. Las Vegas, NV.

- Navarro. 2021. *Radioactive Waste Acceptance Program Technical Basis: Technical Paper (E) Guidance for Setting the NNSSWAC Criteria for Scope of Waste Profiles*, N/0002653--079. Las Vegas, NV.

- Shott, G.J., L.E. Barker, S.E. Rawlison, M.J. Sully, and B.A. Moore. 1998. *Performance Assessment for the Area 5 Radioactive Waste Management Site at the Nevada Test Site, Nye County, Nevada*, Rev. 2.1, DOE/NV/11718-176. Las Vegas, NV.

- U.S. Department of Defense, U.S. Department of Energy, U.S. Environmental Protection Agency, and U.S. Nuclear Regulatory Commission. 2000. *Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)*, NUREG-1575, Rev. 1; EPA 402-R-97-016, Rev. 1; DOE/EH-0624, Rev. 1. August.

- U.S. Department of Energy and U.S. Nuclear Regulatory Commission. 2018. "Nuclear Material Transaction Report," DOE/NRC Form 741. Washington, DC.

- U.S. Environmental Protection Agency. 2006. *Guidance on Systematic Planning Using the Data Quality Objectives Process*, EPA QA/G-4, EPA/240/B-06/001. Washington, DC: Office of Environmental Information.

- U.S. Environmental Protection Agency. 2021. *The SW-846 Compendium*. Available at https://www.epa.gov/hw-sw846/sw-846-compendium.

- Waste Certification Officials (WCO) Working Group. 2017. "Position Paper for High Moisture Content Waste," Rev. 1, March. Included as Attachment K to *NNSSWAC Waste Management Reference Material* (Electronic Reference Document), Rev. 0. October.

15.0 Requirement Documents

The following requirement documents are noted with superscripts within the text.

Text Superscripts	Requirement Documents
DOE Directives and Standards	
A.1.1	DOE O 414.1D
A.1.2	DOE M 435-1-1 IV.G
A.1.3	DOE M 435.1-1 IV. I
A.1.4	DOE M 435.1-1 IV. K
A.1.5	DOE Hoisting and Rigging Standard, DOE-STD-1090-Current Publication
NNSS Permits and Plans	
A.2.1	Hazardous Waste Permit Number: HW0101, Current Revision
A.2.2	State of Nevada Solid Waste Disposal Site Permit, SW 532, Current Revision
Other Requirements	
A.3.1	"Position Paper for High Moisture Content Waste," Revision 1, March 2017
A.3.2	RWAP Technical Basis Paper E, "Guidance for Setting the NNSSWAC Criteria for Scope of Waste Profile," N/0002653--079
A.3.3	Addendum 2 to the "Performance Assessment for the Area 5 Radioactive Waste Management Site at the Nevada Test Site, Nye County, Nevada," DOE/NV/11718-176-ADD2, 06/2006; table A5.2 second column, 6/27/2006

Appendix A

Phone Listings and Contact Details

NNSSWAC Referenced Contact Information

Title	Contact	Phone Number	Fax	Email Address
Program Contacts				
DOE EM Nevada Deputy Program Manager, Operations	Bill Wilborn	702-724-0823	--	Bill.Wilborn@emcbc.doe.gov
RWAP Manager	Marilew Bartling	702-724-0881	--	marilew.bartling@emnv.doe.gov
RWAP Coordinator	Nicole Carson	702-724-0970	--	RWAP@emnv.doe.gov
RWAP SharePoint Coordinator	Joan Newton	702-724-0895	-	Joan.Newton@emnv.doe.gov
LWIS Administrator	Rose Denton	702-295-4296	--	dentonrc@nv.doe.gov
RWMC Scheduling and Submissions				
RWMC Waste Operations Supervisor	Brian Konrad	702-295-1240 (cell) 702-630-8039	--	WMINFO@nv.doe.gov
NNSS Waste Generator Coordinator	Katie Tanaka	702-295-9306	702-295-3084	wmforecast@nv.doe.gov
NNSS Senior Security Specialist	Keith Davenport	702-295-3771	--	DAVENPKM@nv.doe.gov
NNSS Nuclear Materials Control and Accountability NMMSS Contact	Laura Harris	702-295-3760	--	HARRISLR@nv.doe.gov
Emergency or Off-Normal Transportation Events				
NNSS Operations Command Center (OCC)	--	702-295-0311 702-295-4015	--	--

See SharePoint for most current list.

Appendix B

NNSS Application of DOE Order 414.1D Criteria

Order and Regulatory Reference	NNSS Specific Expectation to the QA Criteria	AWAC References
Criterion 1 – Management/Program		
DOE O 414.1D Attachment 2 (1)(a-b) 10 CFR 830.122(a)(1-2)	• Organizational structure identifying key WCP elements. • Clear WCO lines of reporting within the organization and to DOE/NNSA local site office when applicable. • WCO involvement in key management decisions impacting WCP elements.	Section 2.0
Criterion 2 – Management/Personnel Training and Qualification		
DOE O 414.1D Attachment 2 (2)(a-b) 10 CFR 830.122(b)(1-2)	• Initial and continuing training for WCO, AWCO, and package certifier • Training for personnel involved in waste management commensurate with responsibilities, including WGs.	Section 2.0
Criterion 3 – Management/Quality Improvement		
DOE O 414.1D Attachment 2 (3)(a-d) 10 CFR 830.122(c)(1-4)	• Documented processes to detect quality problems related to key WCP elements with evidence of corrective action implementation and recurrence prevention. • Documented process controls for identifying (e.g., tagging, labeling) and segregating nonconforming items, components, and systems related to key WCP elements. • Involvement of WCO in the notification and disposition of nonconforming items. • Involvement of WCO in corrective action reviews related to waste management.	Section 2.0
Criterion 4 – Management/Documents and Records		
DOE O 414.1D Attachment 2 (4)(a-b) 10 CFR 830.122(d)(1-2)	• Document control system for instructions, procedures, plans, and other relevant information applicable to waste management and waste certification activities. • Records related to the waste management cycle are maintained in accordance with a documented records management system. • Records are compiled into a records management system that includes provisions for transmittal, distribution, retention, handling, correction, disposition, and retrievability.	Sections 2.0, 3.2, 5.0, 6.0, and 7.0
Criterion 5 – Performance/Work Processes		
DOE O 414.1D Attachment 2 (5)(a-d) 10 CFR 830.122(e)(1-4)	• Written procedures addressing waste management from the point of generation. • Written procedures directing the WCO work elements. • Identification of components and items used in waste management for traceability, proper use, and accountability and to prevent damage, loss, or deterioration. • Documented waste traceability from point of generation through shipment. • Documented waste characterization data traceability to waste packages.	Sections 2.0, 5.0, and 7.0

Order and Regulatory Reference	NNSS Specific Expectation to the QA Criteria	AWAC References
Criterion 6 – Performance/Design		
DOE O 414.1D Attachment 2 (6)(a-e) 10 CFR 830.122(f)(1-5)	• Documented design basis referencing applicable standards, and/or engineering or scientific principles for waste management items and/or systems and processes including package design, characterization strategies, and treatment. • Documented design interfaces for adequate input. • Documentation of design adequacy by qualified personnel independent of the design. • Documented processes for control of design changes.	Sections 5.1, 5.2, 6.2.1, 6.4.1, 6.4.3, and 6.5
Criterion 7 – Performance/Procurement		
DOE O 414.1D Attachment 2 (7)(a-c) 10 CFR 830.122(g)(1-3)	• Procurement documentation identifying applicable technical requirements such as drawings, specifications, codes, standards, regulations, tests, inspection and acceptance criteria, and certification records for waste management items/services. • Documentation of approval of original and revised procurement documentation by qualified and authorized personnel. • Documented processes for changes or revisions to procurements. • Specified criteria for supplier selection for waste management items, components, and/or services (e.g., waste packaging, waste treatment services). • Documented evaluation methods (e.g., audit, surveillance, source inspection, receipt inspection, or third-party audits). • Documented evaluation criteria for accepting third-party audits. • Documented testing or verification criteria for off-the-shelf waste management items (e.g., sorbents) procured to manufacturer specifications. • Documented processes for continued evaluation of approved suppliers.	Sections 5.0 and 6.0

Order and Regulatory Reference	NNSS Specific Expectation to the QA Criteria	AWAC References
Criterion 8 – Performance/Inspection and Acceptance Testing		
DOE O 414.1D Attachment 2 (8)(a-b) 10 CFR 830.122(h)(1-2)	• Documented processes specifying the acceptance criteria for the inspection and/or testing identifying the items, components, services or processes evaluated; the inspector; the results; and actions taken regarding identified nonconformances. • Documented receipt inspections using procurement or design criteria. • Documented in-process inspections, including waste container pre-use inspections and waste packaging activities. • Documented NNSSWAC compliance certification of waste package(s) and waste shipment. • Documented processes for ensuring M&TE is controlled, uniquely identifiable, calibrated as indicated by calibration date or due date, and any limitations identified. • Documentation that M&TE is traceable to a nationally recognized standard or equivalent means to ensure accuracy. • Documentation for inspection of rigging equipment and lifting devices. • Training and control requirements for M&TE used for NNSS waste package certification are specified.	Sections 2.1.1, 6.0, and 6.5
Criterion 9 – Assessment/Management Assessment		
DOE O 414.1D Attachment 2 (9) 10 CFR 830.122(i)(1)	• Documented management assessments, including WCO involvement.	Section 2.2.2
Criterion 10 – Assessment/Independent Assessment		
DOE O 414.1D Attachment 2 (10)(a-c) 10 CFR 830.122(j)(1-3)	• Documented independent assessment of the WCP.	Section 2.2.3
Criterion 11 – Suspect/Counterfeit Items (S/CI) Prevention		
DOE O 414.1D, Attachment 3 (1)	• Documented program with identified resources that includes S/CI oversight and prevention of items, components, and services entering the WG's supply chain. • Documented system for initiating internal nonconformance report process; evaluating the suspect item(s) or component(s); and notifying the local site DOE/NNSA representative, RWAP Manager and Inspector General contact and retaining item.	Section 6.0

Order and Regulatory Reference	NNSS Specific Expectation to the QA Criteria	AWAC References
Criterion 12 – Safety Software Quality Assurance Requirements for Nuclear Facilities		
DOE O 414.1D, Attachment 4 (as applicable to the NNSSWAC)	• Documented processes for commercial/government off-the-shelf acquisition or internal generated customized safety significant and non-safety significant software that is applicable to waste management activities specifying criteria for testing and acceptance. • Documented processes for change control, configuration management, and retirement of software. • Documented processes for verification and validation, control, and maintenance of spreadsheets or programs developed externally or internally that generate data used in waste management and waste certification.	Sections 2.0, 5.0, 5.2.1, and 5.2.3

Appendix C

Example Bar Code

Bar Code Example:

Bar Code Specifications:

- Code 39
- Low to medium density, low density preferred
- 1-inch high bar code not to exceed 6 inches wide
- Human readable interpretation (HRI) 1/2 inch high, printed below the bar code
- Spacing between bar code and HRI will be 1/10 inch
- Minimum left and right margin (quiet zones) will be at least 1/25 inch
- Bar codes and HRI will be stacked with a minimum separation of 1/2 inch and in the following order: shipment number, container number

Appendix D

List of Forms

The following forms are available on SharePoint:

1. RWAP-FR-001: Profile A: Low-Level Waste, Classified Non-hazardous Waste, or Solid Waste Cell Waste
2. RWAP-FR-002: Profile B: Mixed Low-Level Waste or Classified Hazardous Waste
3. RWAP-FR-004: Pre-Treatment Notification
4. RWAP-FR-005: Request for Standalone Deviation from NNSSWAC Requirements
5. RWAP-FR-006: Reserved
6. RWAP-FR-007: Profile Annual Recertification Request
7. RWAP-FR-008: Lead Shielding Disposal Review Request
8. RWAP-FR-009: NNSS ALARA Planning Form for Elevated Dose Shipments
9. RWAP-FR-010: PSDR and Instructions
10. RWAP-FR-011: Shipment Waste Certification Statement
11. RWAP-FR-012: NNSS Profile Data Tables
12. RWAP-FR-013: Nevada National Security Site Advance Shipment Notification
13. RWAP-FR-014: NNSS Real Time Radiography (RTR) Verification Review
14. RWAP-FR-036: NNSS Access Requirements and Prohibited Items List
15. RWAP-FR-044: Onsite Verification Request
16. RWAP-FR-049: Waste Profile Status Change Notification
17. RWAP-FR-098: NNSSWAC Implementation Crosswalk

Appendix E

Generator Site Designator Codes

Generator Site Designator Codes

Note: If generator site is not listed, contact the LWIS Administrator

Generator	RWMC Designator	Site Designator
Aberdeen Proving Ground	USAA	AP
Advanced MW Treatment Project	AMWP	AM
Argonne National Lab	ANLE	AE
Brookhaven National Lab	BNLX	BR
Y-12	BWXT	BW
EnergySolutions	DRTK	DR
DUF6 Conversion Project (Portsmouth & Paducah)	DUF6	DU
Idaho National Lab	NEID	NE
Idaho Cleanup Project	INEL	IN
LANL/NNSA	LANL	LA
LLNL	BCLA	LL
Nevada National Security Sites/NNSA	LRY5	DP
Nuclear Fuel Services	NFSI	NF
Oak Ridge Reservation	ORTN	OR
Paducah	PGDP	PD
Pantex	AMHP	PX
PermaFix	PERM	PF
Portsmouth	PORT	PO
Sandia	ASLA	SA
Savannah River	SVRS	SR
NNSS/Environmental Management	LITN	IT
TRU Waste Processing Center	FWOR	FW
Oak Ridge National Lab	ORNL	OL
West Valley	WVDP	WV

Appendix F

Requirements for Project Certification

F.1.0 Purpose

This appendix identifies the requirements for the certification of waste from a project as part of the NNSSWAC:

- Waste certification at an off-site facility under an approved WCP
- Waste from a specific project not covered by an approved WCP

For the purpose of this appendix, projects include waste certification conducted at remote facilities by approved WGs who are DOE site contractors or commercial TSDFs as identified in AWAC Sections 1.3.3.1 and 1.3.3.2, respectively. This appendix also defines the requirements for fixed work scope projects executed by project contractors as described in AWAC Section 1.3.3.4.

Unless otherwise specified in the NNSSWAC or this appendix, requirements in Sections 4.0 through 15.0 of the AWAC and requirements in the TWAC are applicable to project waste shipped to the NNSS. The project's demonstrated program compliance with the NNSSWAC will be the basis of an approval recommendation by RWAP to DOE EM Nevada Program. The goal is to provide a graded approach appropriate to the waste types and volumes to be shipped.

F.2.0 Requirements for Off-Site Waste Certification Activities under an Approved WCP

WGs with an approved WCP that incorporate provisions for conducting work at off-site locations require no further action. If the WG's WCP does not address off-site certification activities, they *shall* follow the information below to ensure the elements of their approved WCP are fully implemented at the off-site facility/project location. The requirements in this section supersede the instructions in the rescinded *Guidance for Planning and Performing Off-Site Waste Certification,* Rev. 2, April 2017, as referenced in the NNSSWAC, DOE/NV-325-16-00.

The WG *shall* notify the RWAP Manager of the proposed waste stream(s) to be generated, processed, certified, and shipped from the off-site entity. Waste PTNs (if applicable) and WPs *shall* be developed and submitted in accordance with AWAC Section 4.0, and *shall* identify the off-site waste generating entity (e.g., facility or project). The WG *shall* document within their WCPP how they will evaluate off-site waste generating entity (e.g., permanent facilities or

projects) and how they will certify the execution of waste activities including, but not limited to, chemical characterization, radiological characterization, waste processing and tracking, packaging, and transportation in accordance with the NNSSWAC.

The WG (NNSS-approved WCP) *shall* document the following for specific projects performed remotely:

- Completion of a "gap analysis" identifying key WCP elements that will be performed by WG personnel and elements that will be performed by off-site waste generating entity personnel. Submission to RWAP of an off-site project NIC documenting the specific procedures, processes, and methods for ensuring compliance with applicable NNSSWAC QA, radiological characterization, chemical characterization, traceability, and packaging and transport requirements.

- WG WCO review and concurrence of the waste generating entity procedures pertinent to NNSSWAC compliance.

- Assignment and training of an off-site project WCO.

- Training of assigned off-site waste generating entity personnel responsible for conducting activities potentially impacting NNSSWAC compliance.

- Submission of a Waste Certification Project Plan (WCPjP) documenting the WG's compliance with AWAC Appendix B, specifically identifying the WG's responsibilities and off-site waste generating entity organization responsibilities with an organization chart for the waste generating entity depicting the required organizational interfaces, roles and responsibilities, authorities, and reporting structure and integration of the WG certification personnel or inclusion of the project information in the WCPP.

- Schedule for any periodic WG assessments of the off-site facility/project management process controls to ensure NNSSWAC compliance.

RWAP has the option of scheduling a facility evaluation at the waste generating entity. The WG *shall* facilitate access for RWAP personnel.

F.3.0 Requirements for New Projects To Obtain an NNSS-Approved WCP

As stated in AWAC Section 1.3.3.4, projects are fixed work scopes with defined waste types, waste volumes, and defined completion dates that are conducted at DOE/NNSA or other sites that do not have an approved NNSS WCP. These projects may establish a contract with an organization that has an approved WCP, or they may certify their waste under a specific

WCPjP and obtain project approval from DOE EM Nevada Program. Projects pursuing a project approval *shall* follow the steps outlined in Sections F.3.1 through F.3.6.

F.3.1 Contact the RWAP Manager

The project contractor *shall* contact the RWAP Manager, who will obtain pertinent information regarding the project to submit to DOE EM Nevada Program for consideration. An eligibility determination as described in AWAC Section 1.2 may be required to assure the waste to be generated under the project meets NNSS eligibility requirements. The RWAP Manager will also facilitate access to SharePoint or will facilitate the transfer of necessary information.

F.3.2 Prepare WCPjP

The project contractor (WG) *shall* submit a WCPjP compliance with AWAC Appendix B, including the following key elements:

- Description of the project organization inclusive of the WCO and depicting organizational interfaces, authorities, and reporting structures for critical elements.
- Assignment of an WCO.
- Description of how project contractor personnel will be trained in NNSSWAC requirements as applicable to their role and responsibilities.
- Description of whether the project contractor will utilize higher level programs (e.g., corporate procedures, corporate QAPP) for any of the five key elements (QA, radiological characterization, chemical characterization, traceability, and packaging and transportation); or whether the project will utilize customized controls (e.g., controls for procurement, inspection and use of a singular identified container type, specific controls for collection and evaluation of data).
- Estimated timeline for the project start and completion date, including any milestone dates for waste shipments.
- Estimated volume, number of containers, and types of waste (low level, mixed, classified).

F.3.3 Project NIC and Project Documentation for New Projects

The project contractor *shall* develop a NIC as described in AWAC Section 2.1.2. The NIC template is available on SharePoint. The project *shall* provide references (e.g., document or form references) for all applicable requirements and may mark those elements that do not apply to the project as N/A. The project contractor *shall* supply copies of plans, procedures and work instructions identified in the project NIC and requested by RWAP. The project *shall* upload documents directly to SharePoint if available.

F.3.4 Project WP(s) for New Projects

The project contractor *shall* submit WP(s) to RWAP for the waste to be shipped to NNSS prior to the RWAP certification audit.

F.3.5 RWAP Assist Visit

AWAC Section 3.1.4 recommends that new WGs and new projects request an RWAP assist visit prior to requesting an audit. This allows for the identification of issues prior to the audit and does not require any written responses. WPs are not required to be submitted prior to an RWAP assist visit.

F.3.6 RWAP Audit

The project contractor *shall* undergo an audit prior to approval to ship waste from the project site. AWAC Section 3.1.1.2 applies to projects with the following exception; no independent assessment is required, but it is encouraged. In the absence of an independent assessment, the project assigned WCO *shall* document their review and concurrence with the project/facility contractor procedures to ensure NNSSWAC compliance.

The NNSSWAC requirement for a 90-day notification for an RWAP audit requested by the local DOE/NNSA site office with oversight of the project may be waived by the DOE EM Nevada Deputy Program Manager, Operations, upon request from the local DOE/NNSA site office of the project. The decision to waive may be based on project complexity and volumes of the waste.

The WG *shall* adhere to AWAC Section 3.2, and *shall* respond to findings and observations in a timely manner. Findings *shall* be closed prior to RWAP recommending project approval to DOE EM Nevada Program for project approval.

F.3.7 Approval

F.3.7.1 Profile Approval

The project contractor (WG) *shall* submit WP(s) to RWAP for WARP review and *shall* respond to any comments as described in AWAC Section 4.0.

F.3.7.2 Project Approval

Upon satisfactory response to any findings or observations from the audit and successful recommendation for project WP(s), project approval will be issued by the DOE EM Nevada Program Manager.

Appendix G

Instruction for Shipment of Classified Matter High-Risk Personal Property to NNSS Area 5

G.1.0 Purpose

This appendix identifies the requirements for transfer of classified matter HRPP/classified waste to the NNSS in accordance with the Classified Matter Interim Guidance, for permanent burial in the HW0101 RCRA Permitted Cells.

Unless otherwise specified in the NNSSWAC or this appendix, NNSSWAC requirements in the AWAC and requirements in the TWAC are applicable to classified matter HRPP or classified waste shipped to the NNSS for permanent burial.

G.2.0 Requirements for Shipments of Classified Matter HRPP

When transferring classified matter HRPP/classified waste to the NNSS under the exclusions of the military munitions definition, the WG *shall* transfer the waste to the NNSS on a Bill of Lading. The WG *shall* provide a UHWM completed per the instructions below, and a completed and signed LDR to RWMC personnel. The LDR form format is not specified; the only requirement is that it is compliant with 40 CFR 268.7. If the WG transfers the classified matter HRPP/classified waste as RCRA waste, no Bill of Lading will be provided; the completed UHWM will serve as the shipping paper.

Instructions for Completing the UHWM for Classified Matter HRPP

Block(s)	Instruction
1	Complete with Generator Site ID Number.
2	Complete Page Number.
3	Complete Emergency Response Phone Number. (If declaration is made at the NNSS, the emergency number could be the OCC.)
4	Enter assigned Manifest Tracking Number.
5	Complete Generator's Name and Mailing Address (must be completed no matter where the declaration is made).
6 and 7	Complete only if shipped as RCRA regulated waste. If shipped as classified matter/classified waste under the Military Munitions Rule exclusion, state the following: "Classified matter/classified waste transferred from the generator site to the NNSS under the Military Munitions Rule Exclusion on a Bill of Lading."

Instructions for Completing the UHWM for Classified Matter HRPP

Block(s)	Instruction
8	Complete with the address listed in the current Safeguards and Security Information Management System – currently as follows: MSTS in Care of USDOE Waste Management Area 5, RWMC, Nevada National Security Site Mercury, NV 89023
9a	Mark as required for shipment.
9b	Complete if containers shipped as RCRA regulated waste. If shipped as classified matter/classified waste under the Military Munitions Rule, state the following: “Classified matter/classified waste transferred from generator site to the NNSS under the Military Munitions Rule exclusion on Bill of Lading (BOL#XXXX), Profile XXXXXXXXXXXXX.”
10	Complete number and type of containers.
11 and 12	Complete total quantity in Block 11 per unit identified in Block 12.
13	List all applicable Waste Codes that will be assigned to the classified waste permanently buried in the classified RCRA permitted cell.
14	Generator’s discretion if shipped as classified waste. If shipped as classified matter under the Military Munitions Rule exclusion, state the following: “This manifest identifies unsanitized AEA High-Risk Personal Property that was transferred as excluded from the Military Munitions Rule definition. Upon receipt and acceptance at the NNSS as evidenced the Designated Facility Owner or Operator signature in Block 20, the identified container(s) will be managed under RCRA Permit HW-0101 and will be permanently buried in a classified RCRA permitted cell.”
15	Complete name, signature, and date.
16	Complete if applicable.
17	Completed by the transporter if the containers are shipped as RCRA regulated waste. If shipped as classified matter under the Military Munitions Rule, no entry is necessary.
18 and 19	To be completed by MSTS as necessary.
20	MSTS to complete name and signature entries.

Glossary of Terms

Note: This glossary contains terms that appear in the AWAC and/or the TWAC.

Accident: An occurrence involving a commercial motor vehicle operating on a highway in interstate or intrastate commerce that results in a fatality; bodily injury to a person who, as a result of the injury, immediately receives medical treatment away from the scene of the accident; or one or more motor vehicles incurring disabling damage as a result of the accident, requiring the motor vehicle(s) to be transported away from the scene by a tow truck or other motor vehicle (49 CFR 390.5[1]).

Bulk Waste: Waste packaged in a soft-sided container (e.g., supersacks, burrito wraps), metal cage/pallet combinations or unpackaged waste items, surface contaminated object, low specific activity equipment, large machinery storage tanks, and similar items.

Causal Factor Analysis: Analysis of a finding to determine the cause(s) of why it occurred and to identify specific actions in preventing recurrence. There are no requirements to use an industry recognized root cause analysis method.

Certificate of Compliance (COC): Certificate issued to certify that a package (packaging and contents) meets the applicable safety standards in 10 CFR 71, "Packaging and Transportation of Radioactive Material."

Certified Waste: Waste that has been certified as compliant with the NNSSWAC under an approved certification program.

Chelating Agents: Chemical compounds that react with metal ions to form a stable, water-soluble complex, such as amine polycarboxylic acids (e.g., EDTA, DPTA), hydroxy-carboxylic acids, and polycarboxylic acids (e.g., citric acid, carbolic acid, gluconic acid).

Chemical Screening: Process in which waste is tested for characteristics such as ignitability, corrosivity, and reactivity.

Classified Matter: Anything in physical form that contains or reveals classified information. For the purposes of this document, classified matter includes, but is not limited to, nuclear weapons, nuclear devices, and non-nuclear components thereof (including subparts of components) managed under DOE's nuclear weapons program, which still must have necessary sanitization operations completed thereof under the requirements of the *Atomic Energy Act* (AEA) of 1954, as amended.

Classified Waste: Classified matter HRPP managed under 41 CFR 109-1.53 which the generator and the Officially Designated Federal Security Authority have approved for permanent burial at the NNSS.

Closed Transport Vehicle: Transport vehicle or conveyance equipped with a securely attached exterior enclosure that during normal transportation restricts the access of unauthorized persons to the cargo space. The enclosure may be either temporary or permanent, and in the case of packaged materials may be of the "see-through" type, but must limit access from the top, sides, and bottom; and must provide protection from unfavorable weather conditions during transit.

Controlling Documentation: The plans, procedures, work instructions, checklists, and other instruction documents used to direct work.

Corrective Action: Measures taken to rectify conditions adverse to quality and, where necessary, to preclude repetition.

Dedicated Service: A transport vehicle dedicated to waste cargo destined for the NNSS.

Demilitarization: The act of eliminating the functional capabilities and inherent design features from an item, to prevent the item from being used for its originally intended purpose and to prevent the release of inherent design information that could be used against the United States. (Modified from DOE G.580.1-1A).

Direct Disposal: Disposal of the entire container being shipped, such as an intermodal, where the entire intermodal is removed from the truck and placed in the disposal cell (i.e., no emptying or return of the intermodal container).

Discrepancy: Item noted by RWMC personnel upon receipt of paperwork or packages that requires further review (e.g., damaged label or TID).

DOT Specification 7A, Type A Equivalence: Design specifications, testing data, analyses, or other documentation on the containers demonstrating that the evaluated container or item meets the requirements of DOT specification 7A, Type A, packaging.

Engineered System: A designed and constructed system of components that processes inputs and has waste outputs operated either continuously or on a batch basis; it may be portable or fixed.

Expend: Process item or component to render any reactive, explosive, or pyrophoric material as inert prior to packaging and shipping, AND/OR process any pressurized item or component to ensure <1.5 atmospheres absolute at 20 °C by expended pressurized gas prior to packaging and shipping.

Finding: A deviation from a requirement specified in the NNSSWAC or a direct regulatory reference listed in the NNSSWAC arising from either incorrect actions, inaction, or omission.

Free Liquid: Liquid that readily separates from the solid portion of the waste under ambient temperature and pressure, including liquid that has been released during handling, storage, or transportation.

Highway Route Controlled Quantity (HRCQ): A quantity within a single package that exceeds: (1) 3,000 times the A_1 value of the radionuclides as specified in 49 CFR 173.435 for special form Class 7 (radioactive) material; (2) 3,000 times the A_2 value of the radionuclides as specified in 49 CFR 173.435 for normal form Class 7 (radioactive) material; or (3) 1,000 TBq (27,000 Ci), whichever is least.

Incident: An unintentional release of hazardous material from a package during transportation, load shift, or any occurrence during transportation in which any of the circumstances identified in 49 CFR 171.15(b) occurs (American National Standards Institute N14.27).

Incompatible Waste: Waste type that might react adversely with its containment materials or commingled waste as defined in 40 CFR 260.10.

Infectious Waste: Waste that may have bodily fluids, including dried fluids, which may have the potential to cause human disease and may reasonably be suspected of harboring human pathogenic organisms.

Inspection: A planned and documented activity to verify that an item, service, or process conforms to specified criteria performed by authorized personnel.

Item: An all-inclusive term used in place of any article or unit, including assembly, component, equipment, or container.

Land Disposal Restricted Waste: Waste that is prohibited from land disposal in accordance with 40 CFR 268.

Land Disposal Restrictions (LDRs): Regulations in 40 CFR 268 that detail wastes prohibited from disposal, treatment standards for land disposal, and prohibitions on storage, including testing, tracking, and recordkeeping requirements.

Low-Level Waste (LLW): Radioactive waste that is not high-level radioactive waste, spent nuclear fuel, transuranic (TRU) waste, byproduct material [as defined in section 11e.(2) of the AEA of 1954, as amended], or naturally occurring radioactive material.

Mixed Low-Level Waste (MLLW): Waste that contains both source, special nuclear, or by-product material subject to the AEA of 1954 (as amended), and a hazardous component subject to RCRA.

Packaging: The assembly of components necessary to ensure compliance with DOT, EPA, and NNSS requirements. It may consist of one or more receptacles, absorbent materials, radiation shielding, spacing structures, thermal insulation, and devices for cooling or absorbing mechanical shocks. The conveyance, tie-down system, and auxiliary equipment may sometimes be designated as part of the packaging.

Pyrophoric Material: A material that, under normal conditions, is liable to cause fires through friction, retain heat from processing, or can be ignited readily; and, when ignited, burns so vigorously and persistently as to create serious transportation, handling, or disposal hazards.

Observation: An observation has no current impact to compliance but, if left unaddressed, could result in an NNSSWAC or regulatory noncompliance in the future through continued action or inaction or omission.

Quality Assurance (QA): Planned and systematic actions necessary to provide adequate confidence that a structure, system, or component will perform satisfactorily in service.

Radioactive Waste: Any garbage, refuse, sludges, and other discarded material, including solid, liquid semisolid, or contained gaseous material that must be managed for its radioactive content.

Real-Time Radiography (RTR): X-ray unit used to examine waste packages.

Regulated Asbestos-Containing Material (RACM): RACM consists of any of the following: (a) friable asbestos material; (b) Category I nonfriable asbestos-containing waste (ACM) that has become friable; (c) Category I nonfriable ACM that will be or has been subjected to sanding, grinding, cutting or abrading; or (d) Category II nonfriable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations. RACM may either be LLW or MLLW, and may be classified.

Remote-Handled Waste: Any waste package/container that has dose rates >100 mrem/hr @ 30 cm.

Removable Contamination: Removable radioactive material on the package surface or shipping vehicle.

Root Cause Analysis (RCA): An industry recognized problem-solving method used to formally identify the primary cause(s) of a finding, solving it, and identifying specific actions to prevent recurrence that is facilitated by a trained specialist.

Sanitization: The irreversible modification or destruction of a component or part of a component of a nuclear weapon, device, trainer, or test assembly as necessary to prevent revealing classified or otherwise controlled information (e.g., unclassified information that is restricted from the standpoint of export control because of its significance for nuclear explosives research, development, fabrication, or proliferation purposes) as required by the AEA of 1954, as amended.

Sealed Sources: Sources where the radioactive material is contained in a sealed capsule.

Security Lock: A lock or other securing device mandated by a security plan or security personnel to prevent access to classified waste or material during transit.

Solidification: A technique that limits the solubility and mobility of waste constituents by immobilization through physical means.

Squib: An engineered device containing small amount of explosive chemicals and a detonator that meets the definition of a DOT hazard class 1.4s.

Stabilization: A technique that limits the solubility and mobility of waste constituents by bonding or chemical reaction with the stabilizing material.

Superload: Transport shipments that exceed 500,000 lb and/or any of the following external dimensions: Height >18 ft; Length >200 ft; Width >17 ft for two-lane road route or >19 ft for four-lane road route.

Supplier: Any individual or organization who furnishes items or services in accordance with a procurement document, including vendor, seller, contractor, subcontractor, fabricator, consultant, and their sub-tier levels.

Tamper-Indicating Device (TID): A device that may be used on a container and that reveals violations of containment integrity.

Transuranic (TRU) Waste: Radioactive waste containing more than 100 nanocuries (3,700 becquerels) of alpha-emitting TRU isotopes per gram of waste, with half-lives greater than 20 years except for (1) high-level radioactive waste; (2) waste that the Secretary of Energy has determined, with the concurrence of the Administrator of the Environmental Protection Agency, does not need the degree of isolation required by the 40 CFR 191 disposal regulations; or (3) waste that NRC has approved for disposal on a case-by-case basis in accordance with 10 CFR 61.

Treatment: Any method, technique, or process designed to change the physical or chemical character of waste to render it less hazardous; safer to transport, store, or dispose; or reduced in volume.

Uniform Hazardous Waste Manifest (UHWM): Shipping document EPA Form 8700-22.

Verification Sampling: Collection of an analytical sample to independently assess the waste. May be collected as a split of a sample, a co-located sample, or a direct sample collected from a system.

Waste Characterization: The identification of waste composition and properties by review of acceptable knowledge (which includes process knowledge); or by nondestructive examination, nondestructive assay, or sampling and analysis, to comply with applicable storage, treatment, handling, transportation, and disposal requirements.

Waste Generator (WG): An individual, facility, corporation, government agency, or other institution that offers waste for disposal at the NNSS.

Waste Package: Packaging/container (e.g., drum, metal box, soft-sided bags, cargoes) together with its contents of waste in final form for disposal/burial at the NNSS.

Waste Profile (WP): General description of the waste stream identifying the source, physical and chemical description, and upper limits on radionuclides. The WP summarizes the waste form, characterization data, and how the population is bounded.

Waste Stream: A waste or group of wastes from a process or a facility with similar physical, chemical, and radiological properties.

Nevada National Security Sites
Waste Acceptance Criteria

Volume II:
Technical and Regulatory
Waste Acceptance Criteria

February 2024

APPROVED FOR PUBLIC RELEASE

Approval Signatures

This document is correct, and the process and criteria stated within meet the U.S. Department of Energy and appropriate federal regulation requirements.

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List of Acronyms and Abbreviations

General Acronyms

AWAC	Administrative Waste Acceptance Criteria
Bq	Becquerel
Bq/g	Becquerels per gram
Bq/m^3	Becquerels per cubic meter
CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act*
CFR	*Code of Federal Regulations*
CSI	Criticality Safety Index
DET	Demonstrated Equivalent Technology
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
DSA	Documented Safety Analysis
FGE	Fissile gram equivalent
ft	Foot
ft^3	Cubic foot
gal	Gallon
g	Gram
HEPA	High-efficiency particulate air
LDR	Land disposal restriction
LLW	Low-level radioactive waste
M	Meter
m^3	Cubic meter
MBq	Megabecquerel
MLLW	Mixed low-level waste
M&O	Management and operating
MSTS	Mission Support and Test Services, LLC
N/A	Not applicable
NAC	*Nevada Administrative Code*
NCSE	Nuclear Criticality Safety Evaluation
nCi/g	Nanocuries per gram
NNSA	National Nuclear Security Administration
NNSA/NFO	U.S. Department of Energy, National Nuclear Security Administration Nevada Field Office
NNSS	Nevada National Security Sites
NNSSWAC	*Nevada National Security Sites Waste Acceptance Criteria*
NORM	Naturally occurring radioactive material

O	Order
PCB	Polychlorinated biphenyl
pCi/g	Picocuries per gram
PE-g	Plutonium equivalent gram
PFAS	Per-and polyfluoroalkyl substance
ppm	Parts per million
PSDR	Package Shipment Disposal Request
RACM	Regulated asbestos-containing material
RCRA	*Resource Conservation and Recovery Act*
RWAP	Radioactive Waste Acceptance Program
SW	Solid waste
$t_{1/2}$	Half-life
TRU	Transuranic
TSCA	*Toxic Substances Control Act*
TWAC	Technical and Regulatory Waste Acceptance Criteria
UHC	Underlying hazardous constituent
USDA	U.S. Department of Agriculture
WG	Waste Generator
WP	Waste Profile
°C	Degree Celsius
µCi	Microcurie
µg/L	Micrograms per liter
µm	Micrometer

List of Radionuclides

Ac	Actinium	C	Carbon
Ag	Silver	Ca	Calcium
Al	Aluminum	Cd	Cadmium
Am	Americium	Ce	Cerium
Ar	Argon	Cf	Californium
As	Arsenic	Cl	Chlorine
At	Astatine	Cm	Curium
Au	Gold	Co	Cobalt
Ba	Barium	Cs	Cesium
Be	Beryllium	Cu	Copper
Bi	Bismuth	Dy	Dysprosium
Bk	Berkelium	Er	Erbium
Br	Bromine	Es	Einsteinium

Eu	Europium	Pr	Praseodymium
Fe	Iron	Pt	Platinum
Fm	Fermium	Pu	Plutonium
Fr	Francium	Ra	Radium
Ga	Gallium	Rb	Rubidium
Gd	Gadolinium	Re	Rhenium
Ge	Germanium	Rh	Rhodium
^{3}H	Tritium	Rn	Radon
Hf	Hafnium	Ru	Ruthenium
Hg	Mercury	S	Sulfur
Ho	Holmium	Sb	Antimony
I	Iodine	Sc	Scandium
In	Indium	Se	Selenium
Ir	Iridium	Si	Silicon
K	Potassium	Sm	Samarium
Kr	Krypton	Sn	Tin
La	Lanthanum	Sr	Strontium
Lu	Lutetium	Ta	Tantalum
Md	Mendelevium	Tb	Terbium
Mg	Magnesium	Tc	Technetium
Mn	Manganese	Te	Tellurium
Mo	Molybdenum	Th	Thorium
Na	Sodium	Ti	Titanium
Nb	Niobium	Tl	Thallium
Nd	Neodymium	Tm	Thulium
Ni	Nickel	U	Uranium
Np	Neptunium	V	Vanadium
Os	Osmium	W	Tungsten
P	Phosphorus	Xe	Xenon
Pa	Protactinium	Y	Yttrium
Pb	Lead	Yb	Ytterbium
Pd	Palladium	Zn	Zinc
Pm	Promethium	Zr	Zirconium
Po	Polonium		

1.0 Introduction

The type, form, and quantity of radioactive, hazardous, and classified waste that the Nevada National Security Sites (NNSS) can receive for disposal by burial is governed by various safety documents, permits, regulations, and U.S. Department of Energy (DOE) directives. The following documents (current versions) establish the operating envelope for the NNSS disposal facility:

- DOE Order 435.1 and associated DOE Manual 435.1-1
- Radioactive Waste Management Basis
- Disposal Authorization Statement
- Hazardous Waste Permit NEV HW0101
- Solid Waste Permit SW 532
- *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA) off-site authorization
- Documented Safety Analysis (DSA)
- Technical Safety Requirements
- U.S. Department of Agriculture (USDA) Compliance Agreement NV-101-NNSS-21

This document, the Technical and Regulatory Waste Acceptance Criteria (TWAC), identifies the technical and regulatory criteria for waste acceptance. Deviations from these criteria will be evaluated in accordance with the *Nevada National Security Sites Waste Acceptance Criteria* (NNSSWAC) Administrative Waste Acceptance Criteria (AWAC) Section 4.2.3, "NNSSWAC Deviations." Referenced Waste Profile (WP) Forms A and B are available on SharePoint.

AWAC and TWAC requirements are identified by the inclusion of the term "*shall*." Non-bolded *shall* statements derive from NNSS operating procedures. Bolded ***shall*** statements are derived from federal or state regulations, permits, regulatory agreements, or the DSA. Hyperlinks to

requirement references are included to source material on the Radioactive Waste Acceptance Program (RWAP) SharePoint site.

2.0 Prohibited Waste

Note: Definitions are provided in the AWAC, "Glossary of Terms." Requirement documents are included in the TWAC, Appendix A.

The following are prohibited from disposal:

- Transuranic (TRU) waste: The concentration of alpha-emitting transuranic nuclides with half-lives >20 years exceeding 100 nCi/g T.5.1
- Infectious waste T.1.1, T.6.1
- Waste containing pathogens or other etiologic agents T.6.1
- Waste containing or capable of generating harmful toxic gases, vapors, or fumes T.5.2, T.6.1
  - Waste cannot contain, or be capable of generating by radiolysis or biodegradation, quantities of toxic gas, vapor, or fumes harmful to the public or disposal facility personnel; and cannot harm the long-term structural stability of the disposal site.
- Corrosive waste T.6.1
- Reactive waste T.6.1
- Ignitable waste T.6.1
- Polychlorinated biphenyl (PCB) waste not authorized for disposal in a State permitted municipal or non-municipal non-hazardous waste landfill, or *Resource Conservation and Recovery Act* (RCRA) permitted landfill T.3.6, T.4.4
- Liquid waste, with the exception of the specific allowances identified in this document T.3.3, T.5.2
- Incompatible wastes T.3.1, T.3.2
  - Wastes, absorbent, stabilization media, or other additives placed in the same container that could result in any of the following: T.3.1
    - Generates extreme heat or pressure, fire or explosion, or violent reaction. T.3.2
    - Produces uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health. T.3.2
    - Produces uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosion. T.3.2

  - Damages the structural integrity of the package or facility containing the waste. T.3.2
  - Threatens human health or the environment through other like means. T.3.2

- Animal carcasses preserved with formaldehyde T.6.1
- Gases as defined by 49 *Code of Federal Regulations* (CFR) 173.115
- The following weapons components:
  - Pits, canned subassemblies, neutron generators, or detonators that have not been demilitarized. Also see Section 3.1.8, #7; and Table 3-3.
  - Squibs that have not been rendered inert. Also see Section 3.1.8, #8; and Table 3-3.
- Spent nuclear fuel with the exception of test specimens of fissionable material irradiated for research and development as described in Section 3.1.8, "Restricted Wastes."

3.0 Acceptable Waste

The Waste Generator (WG) may submit the following waste types for disposal:

- Low-level radioactive waste (LLW) T.6.1
- RCRA hazardous waste that meets land disposal restrictions (LDRs) as stated in 40 CFR 268
- *Toxic Substances Control Act* (TSCA) waste, except those prohibited in Section 2.0
- Classified (can be radioactive or non-radioactive)
- Regulated asbestos-containing material (RACM)/asbestiform

Any combination of these waste types is acceptable, except all non-radioactive waste must be classified. RACM accepted must be radioactive and/or classified. The term "RCRA hazardous waste" in this document is inclusive of any waste that contains a constituent at a concentration regulated as RCRA under U.S. Environmental Protection Agency, state-of-generation, and/or Nevada state regulations. Wastes meeting the waste types described above and generated under CERCLA are accepted.

See Table 3-1 for the general waste allowed in each waste cell type and the corresponding profile form. The designated disposal cell type for each WP will be designated in the WP approval letter.

3.1 Waste Acceptable in DOE O 435.1 LLW Cells

Radioactive waste is eligible for disposal in the DOE O 435.1 LLW cells if it does not contain RACM, and if is not regulated under RCRA by either state or federal regulations at the time of disposal. The WG *shall* document the waste characteristics on Profile Form A, the NNSS Profile for LLW.

3.1.1 Free Liquid Allowances

The WG ***shall*** ensure LLW contains less than 1 percent free liquid by waste volume or 0.5 percent of the volume of the waste processed to a solidified form.T.5.2 See Table 3-3 for additional requirements.

3.1.2 Void Space

The WG *shall* ensure LLW packages are loaded to ensure that the interior volume is as efficiently and compactly loaded to minimize void space. More than one waste stream may be packaged in a disposal container, except those waste streams required to be profiled separately in the AWAC Section 4.2.1, "Wastes To Be Profiled Separately."

3.1.3 PCB Wastes

See Table 3-2 for acceptable PCB waste types, and Table 3-3 for additional requirements.

3.1.4 Radionuclide Content or Concentration

The WG ***shall*** adhere to the AWAC Section 5.2, "Radiological Characterization," and identify radionuclides with a reasonable probability of exceeding 1 percent of the waste concentration action level. The WG ***shall*** report as follows:

- The activity concentration of the radionuclides in the final waste form exceeding 1 percent of the action level (see Table 3-4) on the WP and the Package Shipment Disposal Request (PSDR). T.7.2
- Radionuclides that are alpha-emitting and TRU with a half-life ($t_{1/2}$) greater than 20 years that exceed 10 pCi/g on the WP. TRU waste radionuclides with concentrations that exceed 1 nCi/g ***shall*** be reported on the PSDR. T.7.2, T.7.5
- Activity concentrations in the final waste form that exceed 1 percent of the total activity concentration on the WP and PSDR. The total activity concentration ***shall*** include the activity of all radionuclides, except for those that are exempt from the reporting requirements as specified. For these radionuclides and for those present at a level less than the detection limit of industry-accepted characterization methods, process knowledge should be sufficient for characterization. T.7.2

The WG ***shall*** submit a WP revision for waste packages exceeding the high-range concentration of the approved WP or for reportable radionuclides not listed on the approved WP.

Radionuclides meeting any of the following criteria are exempt from the reporting requirements:

- Any radionuclide that will reach a state of transient or secular equilibrium with a parent radionuclide within 30 years. Radionuclides commonly expected to meet this exemption

are listed in Table 3-5. This includes radionuclides listed in Table 3-4 when a long-lived supporting parent ($t_{1/2}$ ≥5 years) is present.

- Any radionuclide occurring at activity concentrations not exceeding background ranges for the region in which it was generated.

3.1.5 Fissile Material and Nuclear Criticality Safety

The WG ***shall*** ensure the quantity of fissile material in a waste package is limited so that an infinite array of such packages will be subcritical under "as packaged" conditions and if the array were to be flooded with water to any credible degree. T.5.2, T.7.4

The WG ***shall*** report ^{235}U fissile gram equivalent (FGE) and ^{235}U effective enrichment on the WP by completing Table 3-6 or RWAP-FR-012, NNSS Profile Data Tables.xlsx, for each enrichment range of fissile material. Fissile material includes waste containing enriched uranium (^{235}U weight percent ≥0.90), ^{233}U, ^{239}Pu, ^{241}Pu, ^{242m}Am, ^{243}Cm, ^{245}Cm, ^{247}Cm, ^{249}Cf, or ^{251}Cf. The WG ***shall*** confirm the waste does not exceed the total FGE as specified for the effective enrichment.

3.1.5.1 Waste Packages

The WG ***shall*** ensure waste packages comply with any of the following fissile material limits and compliance is documented in the WP: T.7.4

- Meets criteria specified in 49 CFR 173.453, "Fissile Materials – Exceptions," or waste disposal package has a Criticality Safety Index (CSI) equal to zero.

- Does not exceed 350 g of ^{235}U FGE per package nor exceed 2 g of ^{235}U FGE per kilogram of waste (mass of the package is not included in the mass of the waste) (graphite and beryllium ***shall*** not exceed 1 percent by mass of the waste).

  – Both limits ***shall*** not be exceeded. These criteria apply to 55-gal metal drums or larger containers (i.e., 85-gal drums, 4 ft × 4 ft × 6 ft metal boxes) and is not applicable to drums <55-gal or soft-sided, wood, or plastic containers.

- Does not exceed the limits, and the waste package meets the conditions as specified in Table 3-7.

- Does not exceed the limits, and the waste package meets the conditions as specified in Tables 3-8 and 3-9.

The WG has the option to submit a waste-specific nuclear criticality safety evaluation (NCSE) with the WP for waste that does not meet the criteria specified in this section. Please contact the RWAP Manager via email at RWAP@emnv.doe.gov for further information on performing an NCSE. *Note:* A minimum of six months will be required to assess a waste-specific NCSE.

3.1.6 Activity Limits

Activity limits are set by the DSA and are based on ^{239}Pu equivalent grams (PE-g). The WG ***shall*** calculate the total PE-g for either a waste package or a shipment by multiplying the activity of each radionuclide by the PE-g conversion factor (see Table 3-10) and then adding each radionuclide PE-g to get the total PE-g. T.7.5, T.7.6

The PE-g limit for each waste package (e.g., drum, box, soft-sided package or bulk item) ***shall*** be 300 PE-g. The PE-g limit for a conveyance ***shall*** be 2,000 PE-g total for all packages. The WG ***shall*** provide a deviation request if exceeding the individual package and/or conveyance limit prior to release of the conveyance.

Deviation requests may be submitted for U.S. Department of Transportation (DOT) specification 7A, Type A packages—or for which the WG can provide documentation demonstrating DOT specification 7A, Type A equivalence—and are limited to 12,000 PE-g per container and 60,000 PE-g per shipment. T.7.6, T.7.7

DOT Type B Certificate of Compliance packages that are the disposal package do not have a PE-g limit and do not require a deviation.

3.1.7 Sealed Sources

The WG ***shall*** evaluate each source individually against the TRU waste definition (see AWAC, "Glossary of Terms"). The mass of the source and any component integral to the source ***shall*** be used to determine the TRU activity concentration (in nCi/g). For sources in smoke detectors, the activity is divided over the entire mass of detector being disposed. See Table 3-3 for additional requirements and total µCi/limits. The WG *shall* confirm that the sources either originate from a DOE/NNSA site or are included in the inventory of the NNSA Off-Site Source Recovery Program.

3.1.8 Restricted Wastes

The following wastes are eligible for disposal but have additional profiling, characterization, processing, packaging, and/or labeling requirements that must be met; see Table 3-3.

1. Particulate wastes
2. Gases
3. Chelating or complexing agents ≥1% by volume of waste
4. Pyrophoric waste
5. Radioactive animal carcasses
6. Beryllium waste
7. Ferroelectric or electronic neutron generators
8. Squibs
9. 11e.(2) and naturally occurring radioactive material (NORM)
10. Classified waste
11. Soils from fire ant quarantine regions
12. Wastes generating non-toxic gases that may result in pressurization
13. Test specimens of fissionable material irradiated for research and development
14. Sealed sources ≥ 100uCi
15. RACM

Note: While not currently restricted or prohibited, the WP will include fields to enter whether a WP includes known or suspected per-and polyfluoroalkyl substances (PFASs).

3.2 Waste Acceptable in Solid Waste Permitted Cells

The WG ***shall*** ensure that waste to be disposed in the Nevada solid waste permitted cells is limited to one of the following: [T.6.2]

- LLW (classified or non-classified) also containing RACM (not commingled with hazardous)
  - See Table 3-3 for additional requirements.
- LLW with PCB wastes authorized for disposal in a State permitted municipal or non-municipal non-hazardous waste landfill also containing RACM (not commingled with hazardous)
  - See Table 3-2 for acceptable PCB waste types and Table 3-3 for additional requirements.
- Non-radioactive classified waste (not commingled with hazardous)

The WG ***shall*** complete Profile Form A for wastes to be disposed in the solid waste permitted cells.

The WG *shall* ensure waste packages are loaded to ensure that the interior volume is as efficiently and compactly loaded to minimize void space. The WG ***shall*** ensure no liquid waste as defined by *Nevada Administrative Code* (NAC) 444.692(4) [T.4.1] is present, with the exception of incidental liquids in RACM packages resulting from the use of wet removal and handling methods as required by NAC 444.971(1).[T.4.5] Containerized free liquids such as ampules (small articles that contain free liquids required for the article to function [e.g., batteries or capacitors]) are acceptable. The WG *shall* identify containerized free liquid on the WP.

The WG ***shall*** ensure wastes to be disposed in the solid waste permitted cells meet the requirements specified in Sections 3.1.1 through 3.1.8 and Table 3-3.

3.3 Waste Acceptable in RCRA Permitted Cells

Radioactive waste (classified or non-classified) or non-radioactive classified waste that is regulated under RCRA by either state or federal regulations at the time of disposal is eligible for disposal in the RCRA permitted cells. Waste disposed in the RCRA permitted cells may contain RACM. The WG *shall* document the waste characteristics on Profile Form B, the NNSS Profile for Mixed Low-Level Waste (MLLW).

Wastes to be disposed in the RCRA permitted cells ***shall*** meet the requirements specified in Sections 3.3.1 through 3.3.8. Requirements in Sections 3.3.1 through 3.3.8 and in Table 3-3 take precedent over any requirements in Section 3.1 (e.g., free liquid allowances, void spaces). The waste characteristics *shall* be documented on Profile Form B.

3.3.1 PCB Waste Types

See Table 3-2 for acceptable PCB waste types and Table 3-3 for additional requirements.

3.3.2 RCRA Waste Codes

The WG ***shall*** ensure that the codes associated with RCRA hazardous waste to be disposed are included in the NNSS NEV HW0101 RCRA Permit: T.6.1

- D004 through D043
- F001 through F011, F039
- P001 through P018, P020 through P024, P026 through P031, P033, P034, P036 through P051, P054, P056 through P060, P062 through P078, P081, P082, P084, P085, P087 through P089, P092 through P099, P101 through P106, P108 through P116, P118 through P123, P127, P128, P185, P188 through P192, P194, P196 through P199, P201 through P205
- U001 through U012, U014 through U039, U041 through U053, U055 through U064, U066 through U099, U101 through U103, U105 through U138, U140 through U174, U176 through U194, U196, U197, U200, U201, U203 through U211, U213 through U223, U225 through U228, U234 through U240, U243, U244, U246 through U249, U271, U278 through U280, U328, U353, U359, U364, U367, U372, U373, U387, U389, U394, U395, U404, U409 through U411

3.3.3 State of Origin

The WG ***shall*** ensure that all applicable state of origin waste codes are listed on the WP. NNSS accepts California codes 0151, RACM waste; and 0181, Other inorganic solid waste for disposal. Any other state codes must be evaluated by the Waste Acceptance Review Panel prior to WP approval. T.4.2

3.3.4 Land Disposal Restrictions

The WG ***shall*** ensure that MLLW and non-radioactive hazardous classified waste meets the applicable LDR treatment standard requirements in 40 CFR 268, including standards for underlying hazardous constituents (UHCs), if applicable. T.3.5, T.4.3 The WG ***shall*** ensure that macroencapsulation systems submitted to satisfy the RCRA alternative treatment standards are identified by manufacturer on the WP. See Table 3-3 for additional requirements and AWAC Section 6.4.2, “Macroencapsulation System Packaging.”

3.3.5 Liquids

The WG ***shall*** ensure that free liquids are absorbed, stabilized, or otherwise removed from the waste. Containerized free liquids such as ampules (small articles that contain free liquids required for the article to function [e.g., batteries or capacitors]) are acceptable. The WG *shall* identify containerized free liquid on the WP. T.3.3, T.6.1

3.3.6 Non-biodegradable Sorbents

The WG ***shall*** ensure that any sorbents used are non-biodegradable and identified on the WP. T.3.3

3.3.7 Void Space in the HW-0101 Cell

The WG ***shall*** ensure that MLLW containers meet the following criteria with the exception of very small items, such as ampules: T.3.4

(a) at least 90 percent full when placed in the landfill; or
(b) crushed, shredded, or similarly reduced in volume to the maximum practical extent before burial in the landfill.

The WG ***shall*** assess the void space in MLLW equipment and describe any actions taken to minimize voids on the WP.

3.3.8 Volume Declaration

The WG ***shall*** determine the anticipated external container volume in cubic feet (ft^3) and rounded to the nearest whole number, and specify the number of containers on the WP. This will be used to determine the number of containers to be verified. Additional information can be found in AWAC Section 3.1.3, “RWAP Verifications.”

Table 3-1
Waste and Cell Types

Waste Type	DOE O 435.1 LLW Cell Profile Form A	Solid Waste Permitted Cell Profile Form A	RCRA Part B Permitted Cell Profile Form B
Radioactive	Accepted	Accepted	Accepted
Classified	Accepted	Accepted	Accepted
CERCLA	Accepted	Accepted	Accepted
RACM	Not Accepted	Accepted	Only if Commingled with Waste Requiring Disposal in RCRA Cell
RCRA/State Hazardous	Not Accepted	Not Accepted	Accepted
Non-Radiological/Non-Hazardous (must be classified)	Not Accepted	Accepted	Not Accepted
PCB Waste Types		See Table 3-2	

Table 3-2
Acceptable PCB Waste Types

PCB Waste Type	DOE O 435.1 LLW Cell Profile Form A	Solid Waste Permitted Cell Profile Form A	RCRA Part B Permitted Cell Profile Form B
LLW with intact PCB article listed below: • PCB small capacitors • PCB hydraulic machines - drained (<1,000 ppm PCB) • PCB hydraulic machines - flushed (≥1,000 ppm PCB) • PCB contaminated electrical equipment (≥50 ppm but <500 ppm PCB) • Other PCB article <500 ppm PCB • PCB light ballast with PCBs in non-leaking capacitor	Accepted without RACM	Accepted Only if Commingled with RACM	Accepted Only if Commingled with RCRA Regulated Waste
LLW empty PCB container formerly containing PCBs at concentrations <500 ppm PCB	Accepted without RACM	Accepted Only if Commingled with RACM	Accepted Only if Commingled with RCRA Regulated Waste
LLW with PCB bulk product listed below: • Plastics (such as plastic insulation from wire or cable; radio, television, and computer casings; vehicle parts; or furniture laminates); preformed or molded rubber parts and components; applied dried paints, varnishes, waxes, or other similar coatings or sealants; caulking; Galbestos; non-liquid building demolition debris • Other bulk product waste sampled and demonstrated to leach <10 µg/L PCB • Fluorescent light ballasts containing PCBs in the potting material • Non-intact PCB articles as listed above	Accepted without RACM	Accepted Only if Commingled with RACM	Accepted Only if Commingled with RCRA Regulated Waste
LLW PCB bulk product that leaches PCBs ≥10 µg/L or cannot be tested	Not Accepted	Not Accepted	Accepted with or without RACM
LLW PCB remediation waste <50 ppm PCB	Accepted without RACM	Accepted Only if Commingled with RACM	Accepted Only if Commingled with RCRA Regulated Waste
LLW PCB remediation waste ≥50 ppm PCB	Not Accepted	Not Accepted	Accepted with or without RACM

Table 3-3
Waste Type Specific Requirements

TWAC Section	Waste Type	Segregate and Profile Separately (Y/N)	Separate Shipment Numbers (Y/N)	Packaging	Marking/Labeling (not inclusive of DOT requirements)	Processing Requirements or Other
3.1.1	Free Liquid Allowance	N	N	High moisture content evaluation to be completed to determine the potential release of liquid during handling, storage, and transportation. See the NNSS Generator Working Group "Position Paper for High Moisture Content Waste," current revision, for guidance. T.7.1	N/A	When significant temperature and atmospheric differences exist between the operating and disposal sites, additional absorbent should be considered.
3.1.7	Sealed Sources ≥100 µCi	Y	N	May need to be stabilized in the shipping/disposal container to ensure that dose rates remain the same during transport. Lead used as shielding that either is integral or external to the sealed source, and that is used to reduce radiation exposure, is acceptable, and no lead shielding evaluation is required.	N/A	Sources ≥100 µCi (3.7 MBq) *shall* be described in a sealed source profile. T.7.8 Sources <100 µCi can be a component of other waste streams if identified on the WP.
All three sections: 3.1.3, 3.2, 3.3.1	PCB Wastes	Y	Y	N/A	In accordance with 40 CFR 761.40. Out of Service Date legibly marked on each package.	Maintain Approval Letters to satisfy 15-day notification requirements under 40 CFR 761.61(a)(5)(B)(2)(iv) for PCB Remediation Waste, and 40 CFR 761.62(b)(4)(i) or (ii) for PCB Bulk Product.

Table 3-3
Waste Type Specific Requirements

TWAC Section	Waste Type	Segregate and Profile Separately (Y/N)	Separate Shipment Numbers (Y/N)	Packaging	Marking/Labeling (not inclusive of DOT requirements)	Processing Requirements or Other
3.1.8, #1	Particulate Wastes	N	N	Immobilized so that the waste package contains no more than 1 weight percent of less-than-10-μm-diameter particles, or 15 weight percent of less-than-200-μm-diameter particles. Secure packaging may be used in place of immobilization.	N/A	Acceptable secure packaging includes steel boxes, drums with a sealed 6-mil minimum (or equivalent) liner, containers with contents individually wrapped and sealed in plastic, and overpacked containers. If liner in intermodal, 12-mil minimum for soil.
3.1.8, #2	Gases	N	N	Cylinders and aerosol cans are to be depressurized by crushing or puncturing, or by valve stem removal. The WG ***shall*** ensure LLW in a gaseous form is packaged such that the pressure does not exceed 1.5 atmospheres absolute at 20°C. T.6.1 The WG ***shall*** consider quantities of gases potentially generated when determining packaging. Gases cannot exceed the confinement capability of the container. T.7.7	N/A	The presence of any cylinders, pressurized or depressurized (e.g., cylinders, aerosol cans, and/or pressurized gases) ***shall*** be reported on the WP.
3.1.8, #3	Chelating or Complexing Agents ≥1% by Volume of Waste	N	N	Stabilized or solidified.	N/A	N/A

Table 3-3
Waste Type Specific Requirements

TWAC Section	Waste Type	Segregate and Profile Separately (Y/N)	Separate Shipment Numbers (Y/N)	Packaging	Marking/Labeling (not inclusive of DOT requirements)	Processing Requirements or Other
3.1.8, #4	Pyrophoric Waste	N	N	Treated, prepared, and packaged to be nonflammable.	N/A	Waste blended in a hardened concrete matrix and no longer pyrophoric is acceptable.
3.1.8, #5	Radioactive Animal Carcasses	N	N	Animal carcasses containing, or contained in, radioactive materials ***shall*** be packaged with the biological material layered with lime and placed in a metal container. T.6.1 If the resultant waste matrix is capable of gas generation, the container ***shall*** be vented with a carbon composite high-efficiency particulate air (HEPA) filtration device. T.5.3	N/A	Additional information or analysis may be required of the waste decomposition gases.
3.1.8, #6	Beryllium Waste	N	N	Packaged in sealed, impermeable bags (minimum 6 mil), containers, or enclosures to prevent the release of beryllium dust during handling and transportation.	The bags and containers ***shall*** be labeled with the following information: T.1.1 DANGER, CONTAMINATED WITH BERYLLIUM DO NOT REMOVE DUST BY BLOWING OR SHAKING CANCER AND LUNG DISEASE HAZARD	N/A

Table 3-3
Waste Type Specific Requirements

TWAC Section	Waste Type	Segregate and Profile Separately (Y/N)	Separate Shipment Numbers (Y/N)	Packaging	Marking/Labeling (not inclusive of DOT requirements)	Processing Requirements or Other
3.1.8, #7	Ferroelectric or Electronic Neutron Generators	N	N	N/A	N/A	Power source removed in accordance with the requirements specified by NNSA/NFO in the Demilitarization Guidance for Electronic and Ferroelectric Neutron Generators. T.7.9
3.1.8, #8	Squibs	N	N	N/A	N/A	Squibs *shall* be certified as rendered inert.
3.1.8, #9	11e.(2) and NORM	N	N	N/A	N/A	Small quantities of 11e.(2) byproduct material and NORM may be managed as LLW provided they can be managed to meet the requirements for LLW disposal in Section IV.P of DOE M 435.1-1.
3.1.8, #10	Classified Waste	Y	Y	N/A	N/A	Submit a signed DOE or NNSA Security Authorization Letter approving permanent burial with each WP. Submit an "NNSS Advance Shipment Notification" form for classified waste requiring protection from visual observation to the NNSS M&O contractor at least 7 days prior to shipment arrival.

Table 3-3
Waste Type Specific Requirements

TWAC Section	Waste Type	Segregate and Profile Separately (Y/N)	Separate Shipment Numbers (Y/N)	Packaging	Marking/Labeling (not inclusive of DOT requirements)	Processing Requirements or Other
3.1.8, #11	Soils from Fire Ant Quarantine Regions	Y	Y	Per generating site compliance agreement. Minimum of IP-1.	The WG ***shall*** label package as "USDA Regulated Soil."	The WG ***shall*** mark PSDR as "USDA Regulated Soil" (using comment field or check box). T.7.3 The WG ***shall*** mark comment field of shipping papers "USDA Regulated Soil." T.7.3
3.1.8, #12	Wastes Generating Non-toxic Gases That May Result in Pressurization	N	N	Wastes that generate gases that are not toxic but may result in container pressurization or explosion hazards (e.g., hydrogen) through biodegradation, radiolysis or other means *shall* be packaged to prevent pressurization hazards (e.g., equipped with nuclear grade filter units or controlled waste loading).	N/A	The WG ***shall*** provide waste-loading calculations and/or headspace monitoring used to demonstrate control of pressurization with WP along with evidence of an independent review and reviewer's qualifications cited. T.7.7
3.1.8, #13	Test specimens of fissionable material	Y	Y	N/A	N/A	Test specimens of fissionable material irradiated for research and development only, and not for the production of power or plutonium, classified as LLW by the cognizant authority, provided the activity concentration of TRU nuclides does not exceed 100 nCi/g. T.5.4

Table 3-3
Waste Type Specific Requirements

TWAC Section	Waste Type	Segregate and Profile Separately (Y/N)	Separate Shipment Numbers (Y/N)	Packaging	Marking/Labeling (not inclusive of DOT requirements)	Processing Requirements or Other
3.2	RACM	Y	Y	RACM ***shall*** be: T.2.1, T.4.5 - Wetted with a water and surfactant mixture. - Packaged in a plastic bag that is not less than 6 mil in thickness, a combination of plastic bags that equal 6 mil in thickness, or a container that is lined with plastic. If free liquid is present, sorbent ***shall*** be added to ensure compliance with the free-liquids criteria. Sharp edges and corners in the package ***shall*** be padded or protected to prevent damage to the plastic bag during handling, shipping, and disposal. RACM ***shall*** NOT be packaged into soft-sided containers as the only containment.	Label that contains the statements below, or is in compliance with the applicable federal regulation: 	Solid Waste Permit SW 532 only unless combined with waste requiring disposal in RCRA Part B Permitted Cell.

Table 3-3
Waste Type Specific Requirements

TWAC Section	Waste Type	Segregate and Profile Separately (Y/N)	Separate Shipment Numbers (Y/N)	Packaging	Marking/Labeling (not inclusive of DOT requirements)	Processing Requirements or Other
3.3.4	LDR - RCRA Hazardous	Y	Y	N/A	Packages of 451 liters (119 gal) or less ***shall*** be marked with the following: – The words "HAZARDOUS WASTE Federal law prohibits improper disposal. If found, contact the nearest police or public safety authority of the U.S. Environmental Protection Agency" – WG's name and address – Manifest Document Number	Environmental media from cleanup activities require "Contained In" determination from state of origin; documentation waste is primarily environmental media; sampling data. If waste is associated with a Demonstrated Equivalent Technology (DET) or treatability variance, contact the RWAP Manager for required documentation to be submitted.

M&O = Management and operating
N/A = Not applicable
NNSA = National Nuclear Security Administration
NNSA/NFO = U.S. Department of Energy, National Nuclear Security Administration Nevada Field Office
°C = Degrees Celsius

Table 3-4
Radionuclide Action Levels

Nuclide	Action Level (Bq/m^3)	Nuclide	Action Level (Bq/m^3)
^{3}H	6.2E+11	^{210}Pb	3.5E+11
^{14}C	5.4E+15	^{226}Ra	2.1E+07
^{26}Al	9.7E+07	^{228}Ra	1.7E+12
^{36}Cl	1.9E+08	^{227}Ac	1.7E+11
^{39}Ar	9.9E+20	^{228}Th	4.3E+13
^{40}K	9.4E+10	^{229}Th	2.8E+10
^{41}Ca	2.8E+12	^{230}Th	6.0E+07
^{59}Ni	1.7E+14	^{232}Th	8.1E+09
^{63}Ni	3.2E+14	^{231}Pa	1.0E+10
^{60}Co	1.6E+12	^{232}U	4.3E+10
^{85}Kr	2.0E+20	^{233}U	8.2E+10
^{90}Sr	4.3E+11	^{234}U	1.3E+10
^{93}Zr	1.1E+14	^{235}U	1.1E+11
^{93m}Nb	4.6E+15	^{236}U	2.8E+11
^{94}Nb	1.2E+10	^{238}U	3.5E+11
^{99}Tc	3.2E+09	^{237}Np	3.4E+10
^{107}Pd	2.9E+14	^{238}Pu	1.8E+12
^{113m}Cd	6.2E+12	^{239}Pu	5.1E+11
^{121m}Sn	2.1E+14	^{240}Pu	5.2E+11
^{126}Sn	1.1E+10	^{241}Pu	5.8E+12
^{129}I	3.4E+09	^{242}Pu	3.7E+11
^{133}Ba	5.4E+12	^{244}Pu	4.8E+10
^{135}Cs	2.8E+12	^{241}Am	1.7E+11
^{137}Cs	2.5E+11	^{243}Am	5.8E+10
^{150}Eu	9.4E+10	^{243}Cm	8.3E+11
^{152}Eu	4.7E+11	^{244}Cm	3.4E+12
^{154}Eu	1.7E+12	^{245}Cm	4.6E+10
^{151}Sm	2.4E+15	^{246}Cm	9.2E+10
^{166m}Ho	1.2E+10	^{248}Cm	2.9E+10
^{207}Bi	1.1E+11	^{250}Cf	1.5E+12

Table 3-5
Exempt Radionuclides

^{90}Y, ^{93}Nb, ^{126m}Sb, ^{126}Sb, ^{137m}Ba
^{233}Pa, ^{225}Ra, ^{225}Ac, ^{221}Fr, ^{217}At, ^{213}Bi, ^{213}Po, ^{209}Tl, ^{209}Pb
^{239}Np, ^{231}Th, ^{227}Th, ^{223}Fr, ^{223}Ra, ^{219}Rn, ^{215}Po, ^{211}Pb, ^{211}Bi, ^{211}Po, ^{207}Tl
^{234}Th, ^{234m}Pa, ^{234}Pa, ^{222}Rn, ^{218}Po, ^{214}Pb, ^{214}Bi, ^{214}Po, ^{210}Bi, ^{210}Po
^{240}U, ^{240m}Np, ^{240}Np, ^{228}Ra, ^{228}Ac, ^{228}Th, ^{224}Ra, ^{220}Rn, ^{216}Po, ^{212}Pb, ^{212}Bi, ^{212}Po, ^{208}Tl

Note: The progeny radionuclides listed are exempt from reporting requirements when a parent radionuclide is present.

Table 3-6
^{235}U FGE Calculation and Effective ^{235}U Enrichment for LLW Packages

A	B	C	D	E	F	G	H	I
Nuclide	**High Activity Conc. (Bq/m^3)**	**Volume of Package (m^3)**	**Activity (Bq)**	**Specific Activity (Bq/g)**	**Mass of Nuclide (g) (D/E=F)**	**^{235}U FGE Factors**	**^{235}U FGE**	**If FGE is >1% of ^{235}U Mass, Then Include:**
^{233}U				3.6E+08		1.4E+00		
^{235}U				8.1E+04		1.0E+00		
^{239}Pu				2.3E+09		1.6E+00		
^{241}Pu				3.8E+12		3.5E+00		
^{242m}Am				3.6E+11		5.4E+01		
^{243}Cm				1.9E+12		7.8E+00		
^{245}Cm				6.4E+09		2.3E+01		
^{247}Cm				3.5E+06		7.8E-01		
^{249}Cf				1.5E+11		7.0E+01		
^{251}Cf				5.9E+10		1.4E+02		
							TOTAL ^{235}U FGE	
						Mass of ^{238}U =		
						Effective ^{235}U Enrichment = $\frac{\text{Total } ^{235}U \text{ FGE} * 100}{\text{Total } ^{235}U \text{ FGE} + ^{238}U}$ =		

Instructions for completing Table 3-6:

1. Multiply high activity range of the waste stream (Bq/m^3) by volume of waste to determine the maximum activity that could be present in a waste package for the nuclides listed above, resulting in Bq (Column D). For ^{235}U, the activity is required to be included only if the ^{235}U enrichment is equal to or greater than 0.90 percent by weight of total U.

2. Divide activity (Bq) (Column D) by the specific activity of the nuclide (Bq/g) (Column E) to determine the mass of the nuclide (Column F).

3. Multiply the mass (g) (Column F) of each nuclide by the ^{235}U FGE factor (Column G) to determine FGE (Column H).

4. If the FGE value is greater than 1 percent of the ^{235}U mass, then include in Column I to determine the total ^{235}U FGE for a waste package.

5. Effective ^{235}U enrichment (weight %) is calculated by dividing the total ^{235}U FGE by the (total ^{235}U FGE + ^{238}U) and multiplying by 100.

Table 3-7
Allowable Package Fissile Loadings for Various Package Steel Weights

Enrichment (wt% ^{235}U)	Steel Weights (lb)			
	35 lb (16 kg)	48 lb (22 kg)	70 lb (32 kg)	105 lb (48 kg)
	Maximum Grams of ^{235}U per Drum			
80 <x ≤ 100	57	69	86	108
60 <x ≤ 80	60	70	88	110
40 <x ≤60	61	73	90	113
20 <x ≤40	64	76	95	118
15 <x ≤20	70	86	104	130
10 <x ≤15	76	90	109	137
8 <x ≤10	80	98	123	150
7 <x ≤8	86	104	131	159
6 <x ≤7	90	108	133	166
5 <x ≤6	97	116	141	177
4.5 <x ≤5.0	103	124	155	193
4.0 <x ≤4.5	108	127	163	201
3.5 <x ≤4.0	117	140	174	216
3.0 <x ≤3.5	127	156	189	232
2.5 <x ≤3.0	148	179	225	260
2.0 <x ≤2.5	171	210	255	319
1.9 <x ≤2.0	214	256	326	410
1.8 <x ≤1.9	222	283	346	452
1.7 <x ≤1.8	252	308	390	480
1.6 <x ≤1.7	265	326	409	515
1.5 <x ≤1.6	298	367	460	579
1.4 <x ≤1.5	354	423	539	680
1.3 <x ≤1.4	420	514	630	828
1.25 <x ≤1.30	525	652	832	1,047
1.20 <x ≤1.25	607	755	923	1,186
1.15 <x ≤1.20	694	863	1,120	1,460
1.10 <x ≤1.15	836	1,041	1,376	1,736
1.07 <x ≤1.10	1,052	1,313	1,700	2,204
1.04 <x ≤1.07	1,232	1,575	2,011	2,704
1.02 <x ≤1.04	1,511	1,951	2,486	3,297

Table 3-7
Allowable Package Fissile Loadings for Various Package Steel Weights

Enrichment (wt% ^{235}U)	Steel Weights (lb)			
	35 lb (16 kg)	48 lb (22 kg)	70 lb (32 kg)	105 lb (48 kg)
	Maximum Grams of ^{235}U per Drum			
1.00 <x ≤1.02	1,782	2,178	2,974	3,852
0.99 <x ≤1.00	2,073	2,692	3,582	4,615
0.98 <x ≤0.99	2,271	2,916	3,883	5,297
0.97 <x ≤0.98	2,502	3,319	4,156	5,790
0.96 <x ≤0.97	2,972	3,774	4,942	6,638
0.95 <x ≤0.96	3,311	4,259	5,650	8,004
≤0.95	3,826	4,800	6,489	8,621

These values are subject to the following use instructions and restrictions:

1. Linear interpolations between steel weights are allowed, but extrapolation above or below the largest or smallest masses is prohibited. For steel weights in excess of 105 lb (48 kg), use the fissile mass for 105 lb (48 kg).

2. The mass limits do not apply to wastes containing more than 1% beryllium and carbon graphite by gross package weight.

3. For wastes with other fissile nuclides (other than ^{235}U), these nuclides ***shall*** be accounted for by calculating a total ^{235}U FGE and the effective ^{235}U enrichment in accordance with Table 3-6.

4. The total weight of steel in a package may include that of all inner drums such as 10-, 15-, and 30-gal drums inside of a 55-gal drum, and the outer drum.

5. Mixing drums in an overpack (such as commingling 15-, 30-, and 55-gal drums in a 4 ft × 4 ft × 7 ft box) is acceptable as long as the individual drums comply with mass limits.

Table 3-8
Criticality Safety Restrictions for the Use of the Fissile Limits in Table 3-9

Volume of waste container	Nominal 55-gal packages or larger. The container may contain inner packages.
Space between waste container and contents	***Shall*** be filled with loose, pourable material (e.g., vermiculite).
Boron properties (natural)	***Shall*** contain ≈20 atom% ^{10}B.
Boron mass	***Shall*** contain not less than 4 kg (8.82 lb) of boron in any solid, loose, pourable, non-soluble form.
Beryllium and graphite by package weight	***Shall*** be ≤ 1% of the mass of ^{235}U.
Maximum hydrogen content of waste as packaged	The hydrogen to ^{235}U ratio (H:U) ***shall*** be less than 50.
^{235}U mass limits	Values presented in Table 3-9.

Table 3-9
Maximum Grams of ^{235}U as a Function of Enrichment
(Controls As Specified in Table 3-8)

^{235}U Enrichment (Weight %)	^{235}U Mass Limit (grams)	^{235}U Enrichment (Weight %)	^{235}U Mass Limit (grams)
0.95	∞	2.5	2,589
0.96	∞	3	2,263
0.97	∞	3.5	2,055
0.98	∞	4	1,899
0.99	8,839	4.5	1,798
1	8,528	5	1,711
1.02	8,025	6	1,577
1.04	7,547	7	1,496
1.07	7,156	8	1,442
1.1	6,784	9	1,395
1.15	6,360	10	1,352
1.2	5,970	15	1,238
1.25	5,593	20	1,171
1.3	5,339	30	1,108
1.4	4,804	40	1,066
1.5	4,432	50	1,036
1.6	4,091	60	1,019
1.7	3,784	70	1,003
1.8	3,661	80	988
1.9	3,375	90	969
2	3,169	100	935

∞ = Infinity or no limit

For wastes with other fissile nuclides (other than ^{235}U), these nuclides ***shall*** be accounted for by calculating a total ^{235}U FGE and the effective ^{235}U enrichment in accordance with Table 3-6.

Table 3-10
Plutonium Equivalent Gram (PE-g) Radionuclide Conversion Factors

Note: For isotopes not having a direct PE-g conversion factor, the total activity ***shall*** be treated as Pu-239 for alpha emission and as Cs-137 for beta/gamma emission.

Nuclide	Conversion Factors (PE-g/Bq)
Ac-224	1.15E-12
Ac-225	7.50E-11
Ac-226	1.15E-11
Ac-227	4.85E-09
Ac-228	2.20E-13
Ag-102	1.59E-16
Ag-103	2.38E-16
Ag-104	3.26E-16
Ag-104m	2.29E-16
Ag-105	7.14E-15
Ag-106	1.41E-16
Ag-106m	9.70E-15
Ag-108m	3.26E-13
Ag-110m	1.06E-13
Ag-111	1.50E-14
Ag-112	1.50E-15
Ag-115	2.56E-16
Al-26	1.76E-13
Am-237	2.29E-16
Am-238	1.68E-15
Am-239	2.12E-15
Am-240	3.79E-15
Am-241	8.47E-10
Am-242	1.76E-13
Am-242m	8.11E-10
Am-243	8.47E-10
Am-244	3.26E-14
Am-244m	1.41E-15
Am-245	4.94E-16
Am-246	6.08E-16
Am-246m	2.03E-16
As-69	1.85E-16
As-70	5.91E-16
As-71	3.53E-15
As-72	7.94E-15
As-73	8.82E-15
As-74	1.85E-14
As-76	6.53E-15
As-77	3.44E-15
As-78	7.85E-16
At-207	2.03E-14
At-211	9.70E-13
Au-193	1.06E-15
Au-194	2.12E-15
Au-195	1.50E-14
Au-198	7.58E-15
Au-198m	1.76E-14
Au-199	6.97E-15
Au-200	3.09E-16
Au-200m	6.35E-15
Au-201	1.50E-16
Ba-126	9.70E-16
Ba-128	1.23E-14
Ba-131	7.67E-15
Ba-131m	6.88E-17
Ba-133	8.82E-14
Ba-133m	4.06E-15
Ba-135m	3.17E-15
Ba-139	5.20E-16
Ba-140	5.11E-14
Ba-141	3.00E-16
Ba-142	1.94E-16
Be-7	4.85E-16
Be-10	3.09E-13
Bi-200	2.91E-16
Bi-201	5.82E-16
Bi-202	4.85E-16
Bi-203	2.29E-15
Bi-205	8.20E-15
Bi-206	1.50E-14
Bi-207	4.94E-14
Bi-210	8.20E-13
Bi-210m	3.00E-11
Bi-212	2.73E-13
Bi-213	2.65E-13
Bi-214	1.23E-13
Bk-245	1.85E-14
Bk-246	2.91E-15
Bk-247	6.08E-10
Bk-249	1.41E-12
Bk-250	8.82E-15
Br-74	3.35E-16
Br-74m	5.47E-16
Br-75	4.67E-16
Br-76	3.62E-15
Br-77	7.41E-16
Br-80	8.29E-17
Br-80m	6.70E-16
Br-82	5.56E-15
Br-83	4.23E-16
Br-84	3.26E-16
C-11	1.59E-16
C-14	5.11E-14
Ca-41	1.59E-15
Ca-45	3.26E-14
Ca-47	1.85E-14
Cd-104	3.09E-16
Cd-107	7.32E-16
Cd-109	7.14E-14
Cd-113	1.06E-12
Cd-113m	9.70E-13
Cd-115	9.70E-15
Cd-115m	6.79E-14
Cd-117	1.50E-15
Cd-117m	1.85E-15
Ce-134	1.15E-14
Ce-135	4.41E-15
Ce-137	8.82E-17
Ce-137m	3.88E-15
Ce-139	1.68E-14
Ce-141	3.35E-14
Ce-143	7.32E-15
Ce-144	4.67E-13
Cf-244	1.23E-13
Cf-246	3.97E-12
Cf-248	7.76E-11
Cf-249	6.17E-10
Cf-250	3.00E-10
Cf-251	6.26E-10
Cf-252	1.76E-10
Cf-253	1.15E-11
Cf-254	3.62E-10
Cl-36	6.44E-14
Cl-38	3.97E-16
Cl-39	4.06E-16
Cm-238	4.32E-14
Cm-240	3.09E-11
Cm-241	3.26E-13
Cm-242	5.20E-11
Cm-243	6.08E-10
Cm-244	5.03E-10
Cm-245	8.73E-10
Cm-246	8.64E-10
Cm-247	7.94E-10
Cm-248	3.17E-09
Cm-249	3.53E-16
Cm-250	1.85E-08
Co-55	4.67E-15
Co-56	5.91E-14
Co-57	8.82E-15
Co-58	1.85E-14

Table 3-10
Plutonium Equivalent Gram (PE-g) Radionuclide Conversion Factors

Nuclide	Conversion Factors (PE-g/Bq)
Co-58m	1.50E-16
Co-60	2.73E-13
Co-60m	1.23E-17
Co-61	4.50E-16
Co-62m	1.85E-16
Cr-48	1.94E-15
Cr-49	3.09E-16
Cr-51	3.26E-16
Cs-125	2.03E-16
Cs-127	3.35E-16
Cs-129	6.79E-16
Cs-130	1.23E-16
Cs-131	4.14E-16
Cs-132	2.65E-15
Cs-134	1.76E-13
Cs-134m	5.29E-16
Cs-135	7.58E-14
Cs-135m	1.41E-16
Cs-136	2.47E-14
Cs-137	3.44E-13
Cs-138	3.79E-16
Cu-60	3.00E-16
Cu-61	6.88E-16
Cu-64	1.06E-15
Cu-67	5.38E-15
Dy-155	6.79E-16
Dy-157	2.65E-16
Dy-159	3.26E-15
Dy-165	5.29E-16
Dy-166	1.68E-14
Er-161	4.23E-16
Er-165	6.97E-17
Er-169	8.82E-15
Er-171	1.94E-15
Er-172	9.70E-15
Es-250	5.56E-15
Es-251	1.85E-14
Es-253	2.38E-11
Es-254	7.58E-11
Es-254m	4.14E-12
Eu-145	4.85E-15
Eu-146	7.05E-15
Eu-147	9.70E-15
Eu-148	2.29E-14
Eu-149	2.56E-15
Eu-150hr	1.68E-15
Eu-150yr	4.67E-13
Eu-152	3.70E-13
Eu-152m	1.94E-15
Eu-154	4.67E-13
Eu-155	6.08E-14
Eu-156	3.00E-14
Eu-157	2.47E-15
Eu-158	4.14E-16
F-18	5.20E-16
Fe-52	5.56E-15
Fe-55	6.79E-15
Fe-59	3.53E-14
Fe-60	2.47E-12
Fm-252	2.82E-12
Fm-253	3.53E-12
Fm-254	5.38E-13
Fm-255	2.38E-12
Fm-257	6.26E-11
Fr-222	1.23E-13
Fr-223	7.85E-15
Ga-65	1.50E-16
Ga-66	3.88E-15
Ga-67	2.12E-15
Ga-68	4.32E-16
Ga-70	1.41E-16
Ga-72	4.67E-15
Ga-73	1.23E-15
Gd-145	1.76E-16
Gd-146	5.64E-14
Gd-147	3.53E-15
Gd-148	2.29E-10
Gd-149	6.44E-15
Gd-151	7.58E-15
Gd-152	1.68E-10
Gd-153	1.85E-14
Gd-159	2.38E-15
Ge-66	8.02E-16
Ge-67	2.20E-16
Ge-68	1.23E-13
Ge-69	2.56E-15
Ge-71	9.70E-17
Ge-75	3.17E-16
Ge-77	3.26E-15
Ge-78	8.38E-16
H-3	2.29E-15
Hf-170	2.82E-15
Hf-172	2.82E-13
Hf-173	1.41E-15
Hf-175	1.06E-14
Hf-177m	7.94E-16
Hf-178m	2.29E-12
Hf-179m	3.35E-14
Hf-180m	1.15E-15
Hf-181	4.41E-14
Hf-182	2.73E-12
Hf-182m	4.06E-16
Hf-183	5.03E-16
Hf-184	2.91E-15
Hg-193	6.61E-16
Hg-193m	2.29E-15
Hg-194	1.15E-13
Hg-195	6.44E-16
Hg-195m	4.67E-15
Hg-197	2.65E-15
Hg-197m	4.67E-15
Hg-199m	2.82E-16
Hg-203	2.12E-14
Ho-155	1.76E-16
Ho-157	3.70E-17
Ho-159	5.38E-17
Ho-161	5.29E-17
Ho-162	2.47E-17
Ho-162m	1.85E-16
Ho-164	7.41E-17
Ho-164m	1.06E-16
Ho-166	5.73E-15
Ho-166m	1.06E-12
Ho-167	6.26E-16
I-120	8.82E-16
I-120m	7.76E-16
I-121	2.38E-16
I-123	6.53E-16
I-124	3.88E-14
I-125	4.50E-14
I-126	8.64E-14
I-128	1.76E-16
I-129	3.17E-13
I-130	5.91E-15
I-131	6.53E-14
I-132	9.70E-16
I-132m	7.67E-16
I-133	1.32E-14
I-134	4.85E-16
I-135	2.82E-15
In-109	3.70E-16
In-110min	4.14E-16
In-110hr	1.15E-15
In-111	2.03E-15
In-112	6.53E-17
In-113m	1.76E-16
In-114m	8.20E-14
In-115	3.44E-12
In-115m	5.20E-16
In-116m	3.97E-16
In-117	2.56E-16
In-117m	6.35E-16
In-119m	9.44E-17

Table 3-10
Plutonium Equivalent Gram (PE-g) Radionuclide Conversion Factors

Nuclide	Conversion Factors (PE-g/Bq)
Ir-182	2.12E-16
Ir-184	1.06E-15
Ir-185	1.68E-15
Ir-186	2.82E-15
Ir-187	6.97E-16
Ir-188	3.70E-15
Ir-189	5.29E-15
Ir-190	2.12E-14
Ir-190m	8.82E-17
Ir-192	5.82E-14
Ir-192m	3.44E-13
Ir-193m	1.15E-14
Ir-194	4.94E-15
Ir-194m	1.15E-13
Ir-195	6.26E-16
Ir-195m	1.50E-15
K-40	1.85E-14
K-42	1.06E-15
K-43	1.23E-15
K-44	1.76E-16
K-45	1.32E-16
Kr-85	7.86E-24
La-131	2.03E-16
La-132	1.41E-15
La-135	1.23E-16
La-137	7.67E-14
La-138	1.32E-12
La-140	9.70E-15
La-141	1.32E-15
La-142	7.85E-16
La-143	1.85E-16
Lu-169	3.35E-15
Lu-170	5.82E-15
Lu-171	7.76E-15
Lu-172	1.41E-14
Lu-173	2.12E-14
Lu-174	3.70E-14
Lu-174m	3.70E-14
Lu-176	6.17E-13
Lu-176m	1.06E-15
Lu-177	1.06E-14
Lu-177m	1.41E-13
Lu-178	2.29E-16
Lu-178m	2.91E-16
Lu-179	1.06E-15
Md-257	2.20E-13
Md-258	5.20E-11
Mg-28	1.06E-14
Mn-51	3.62E-16
Mn-52	1.23E-14
Mn-52m	2.56E-16
Mn-53	4.76E-16
Mn-54	1.32E-14
Mn-56	1.06E-15
Mo-90	3.17E-15
Mo-93	2.03E-14
Mo-93m	1.50E-15
Mo-99	8.73E-15
Mo-101	2.29E-16
Na-22	1.15E-14
Na-24	2.38E-15
Nb-88	2.47E-16
Nb-89 (66)	6.26E-16
Nb-89 (122)	1.06E-15
Nb-90	5.82E-15
Nb-93m	1.59E-14
Nb-94	4.32E-13
Nb-95	1.59E-14
Nb-95m	7.76E-15
Nb-96	5.82E-15
Nb-97	3.97E-16
Nb-98	5.11E-16
Nd-136	4.76E-16
Nd-138	2.20E-15
Nd-139	8.82E-17
Nd-139m	1.32E-15
Nd-141	4.41E-17
Nd-147	2.12E-14
Nd-149	7.85E-16
Nd-151	1.50E-16
Ni-56	8.82E-15
Ni-57	4.67E-15
Ni-59	3.88E-15
Ni-63	1.15E-14
Ni-65	7.94E-16
Ni-66	1.59E-14
Np-232	1.06E-15
Np-233	1.50E-17
Np-234	4.85E-15
Np-235	5.56E-15
Np-236hr	7.94E-14
Np-236yr	7.05E-11
Np-237	4.41E-10
Np-238	3.09E-14
Np-239	8.82E-15
Np-240	7.94E-16
Os-180	1.32E-16
Os-181	5.73E-16
Os-182	3.35E-15
Os-185	1.41E-14
Os-189m	4.67E-17
Os-191	1.68E-14
Os-191m	1.41E-15
Os-193	4.59E-15
Os-194	7.50E-13
P-32	3.00E-14
P-33	1.32E-14
Pa-227	7.05E-13
Pa-228	6.61E-13
Pa-230	6.70E-12
Pa-231	1.23E-09
Pa-232	8.82E-14
Pa-233	3.44E-14
Pa-234	3.53E-15
Pb-195m	2.38E-16
Pb-198	6.17E-16
Pb-199	3.26E-16
Pb-200	3.09E-15
Pb-201	1.06E-15
Pb-202	1.06E-13
Pb-202m	8.82E-16
Pb-203	1.94E-15
Pb-205	7.50E-15
Pb-209	5.38E-16
Pb-210	4.94E-11
Pb-211	1.06E-13
Pb-212	1.68E-12
Pb-214	1.32E-13
Pd-100	7.50E-15
Pd-101	5.47E-16
Pd-103	3.97E-15
Pd-107	5.20E-15
Pd-109	3.26E-15
Pm-141	1.32E-16
Pm-143	1.32E-14
Pm-144	7.23E-14
Pm-145	3.17E-14
Pm-146	1.85E-13
Pm-147	4.41E-14
Pm-148	1.94E-14
Pm-148m	5.03E-14
Pm-149	6.44E-15
Pm-150	1.15E-15
Pm-151	4.06E-15
Po-203	3.17E-16
Po-205	6.08E-16
Po-207	7.23E-16
Po-210	3.79E-11
Pr-136	1.23E-16
Pr-137	1.85E-16
Pr-138m	6.53E-16
Pr-139	1.76E-16
Pr-142	4.85E-15

Table 3-10
Plutonium Equivalent Gram (PE-g) Radionuclide Conversion Factors

Nuclide	Conversion Factors (PE-g/Bq)
Pr-142m	6.17E-17
Pr-143	2.12E-14
Pr-144	1.59E-16
Pr-145	1.50E-15
Pr-147	1.59E-16
Pt-186	2.91E-16
Pt-188	3.70E-15
Pt-189	3.35E-16
Pt-191	9.70E-16
Pt-193	1.85E-16
Pt-193m	1.06E-15
Pt-195m	1.59E-15
Pt-197	7.50E-16
Pt-197m	2.12E-16
Pt-199	1.06E-16
Pt-200	1.94E-15
Pu-234	2.12E-13
Pu-235	1.32E-17
Pu-236	3.53E-10
Pu-237	3.44E-15
Pu-238	9.70E-10
Pu-239	1.41E-10
Pu-240	1.06E-09
Pu-241	2.03E-11
Pu-242	9.70E-10
Pu-243	7.58E-16
Pu-244	9.70E-10
Pu-245	3.79E-15
Pu-246	7.05E-14
Ra-223	7.67E-11
Ra-224	3.00E-11
Ra-225	6.79E-11
Ra-226	8.38E-11
Ra-227	4.06E-15
Ra-228	1.41E-10
Rb-79	1.41E-16
Rb-81	3.00E-16
Rb-81m	6.17E-17
Rb-82m	9.70E-16
Rb-83	6.08E-15
Rb-84	8.82E-15
Rb-86	8.20E-15
Rb-87	4.41E-15
Rb-88	1.41E-16
Rb-89	1.23E-16
Re-177	1.23E-16
Re-178	1.23E-16
Re-181	2.20E-15
Re-182 (12.7)	1.76E-15
Re-182 (64)	1.06E-14
Re-184	1.68E-14
Re-184m	5.73E-14
Re-186	9.70E-15
Re-186m	1.06E-13
Re-187	5.56E-17
Re-188	4.76E-15
Re-188m	1.15E-16
Re-189	3.79E-15
Rh-99	7.67E-15
Rh-99m	3.53E-16
Rh-100	3.09E-15
Rh-101	4.76E-14
Rh-101m	1.85E-15
Rh-102	1.50E-13
Rh-102m	6.26E-14
Rh-103m	2.38E-17
Rh-105	3.09E-15
Rh-106m	9.70E-16
Rh-107	1.50E-16
Rn-220	5.32E-25
Rn-222	5.50E-25
Ru-94	3.88E-16
Ru-97	9.70E-16
Ru-103	2.65E-14
Ru-105	1.59E-15
Ru-106	5.82E-13
S-35	1.68E-14
Sb-115	1.23E-16
Sb-116	1.15E-16
Sb-116m	4.32E-16
Sb-117	1.50E-16
Sb-118m	1.06E-15
Sb-119	3.17E-16
Sb-120hr	6.44E-17
Sb-120day	9.70E-15
Sb-122	9.70E-15
Sb-124	7.58E-14
Sb-124m	5.20E-17
Sb-125	1.06E-13
Sb-126	2.82E-14
Sb-126m	1.76E-16
Sb-127	1.68E-14
Sb-128min	1.32E-16
Sb-128hr	3.70E-15
Sb-129	2.20E-15
Sb-130	4.67E-16
Sb-131	3.88E-16
Sc-43	9.70E-16
Sc-44	1.59E-15
Sc-44m	1.23E-14
Sc-46	6.00E-14
Sc-47	6.44E-15
Sc-48	9.70E-15
Sc-49	3.53E-16
Se-70	6.70E-16
Se-73	1.85E-15
Se-73m	1.94E-16
Se-75	1.15E-14
Se-79	6.00E-14
Se-81	1.32E-16
Se-81m	4.50E-16
Se-83	3.00E-16
Si-31	6.97E-16
Si-32	9.70E-13
Sm-141	1.32E-16
Sm-141m	2.82E-16
Sm-142	6.26E-16
Sm-145	1.41E-14
Sm-146	9.70E-11
Sm-147	8.47E-11
Sm-151	3.53E-14
Sm-153	5.56E-15
Sm-155	1.50E-16
Sm-156	1.94E-15
Sn-110	1.41E-15
Sn-111	1.15E-16
Sn-113	2.38E-14
Sn-117m	2.12E-14
Sn-119m	1.94E-14
Sn-121	2.03E-15
Sn-121m	3.97E-14
Sn-123	7.14E-14
Sn-123m	2.38E-16
Sn-125	2.73E-14
Sn-126	2.47E-13
Sn-127	1.15E-15
Sn-128	8.11E-16
Sr-80	1.23E-15
Sr-81	3.26E-16
Sr-82	9.70E-14
Sr-83	3.00E-15
Sr-85	7.14E-15
Sr-85m	3.79E-17
Sr-87m	1.85E-16
Sr-89	6.97E-14
Sr-90	1.41E-12
Sr-91	3.62E-15
Sr-92	2.03E-15
Ta-172	3.09E-16
Ta-173	9.70E-16
Ta-174	3.79E-16
Ta-175	1.15E-15
Ta-176	1.76E-15

Table 3-10
Plutonium Equivalent Gram (PE-g) Radionuclide Conversion Factors

Nuclide	Conversion Factors (PE-g/Bq)
Ta-177	9.70E-16
Ta-178	6.00E-16
Ta-179	4.94E-15
Ta-180	2.29E-13
Ta-180m	3.88E-16
Ta-182	8.82E-14
Ta-182m	1.85E-16
Ta-183	1.85E-14
Ta-184	3.79E-15
Ta-185	4.23E-16
Ta-186	1.59E-16
Tb-147	6.70E-16
Tb-149	4.32E-14
Tb-150	9.70E-16
Tb-151	2.03E-15
Tb-153	1.68E-15
Tb-154	3.17E-15
Tb-155	1.94E-15
Tb-156	1.06E-14
Tb-156m (5.0)	8.47E-16
Tb-156m (24.4)	1.85E-15
Tb-157	1.06E-14
Tb-158	4.06E-13
Tb-160	6.17E-14
Tb-161	1.15E-14
Tc-93	3.09E-16
Tc-93m	1.50E-16
Tc-94	1.15E-15
Tc-94m	4.06E-16
Tc-95	9.70E-16
Tc-95m	1.06E-14
Tc-96	6.17E-15
Tc-96m	6.61E-17
Tc-97	1.59E-14
Tc-97m	3.62E-14
Tc-98	3.97E-13
Tc-99	1.15E-13
Tc-99m	1.76E-16
Tc-101	1.06E-16
Tc-104	2.56E-16
Te-116	9.70E-16
Te-121	3.62E-15
Te-121m	5.03E-14
Te-123	3.44E-14
Te-123m	4.50E-14
Te-125m	3.70E-14
Te-127	1.23E-15
Te-127m	8.64E-14
Te-129	3.44E-16
Te-129m	6.97E-14
Te-131	2.47E-16
Te-131m	8.29E-15
Te-132	1.76E-14
Te-133	1.76E-16
Te-133m	7.67E-16
Te-134	6.00E-16
Th-226	5.38E-13
Th-227	8.82E-11
Th-228	3.53E-10
Th-229	2.12E-09
Th-230	8.82E-10
Th-231	2.91E-15
Th-232	9.70E-10
Th-234	6.79E-14
Ti-44	1.06E-12
Ti-45	8.20E-16
Tl-194	3.88E-17
Tl-194m	1.68E-16
Tl-195	1.32E-16
Tl-197	1.23E-16
Tl-198	5.29E-16
Tl-198m	3.26E-16
Tl-199	1.68E-16
Tl-200	1.15E-15
Tl-201	3.88E-16
Tl-202	1.68E-15
Tl-204	3.44E-15
Tm-162	1.41E-16
Tm-166	1.50E-15
Tm-167	9.70E-15
Tm-170	6.17E-14
Tm-171	1.23E-14
Tm-172	9.70E-15
Tm-173	1.59E-15
Tm-175	1.59E-16
U-230	1.41E-10
U-231	3.53E-15
U-232	3.26E-10
U-233	8.47E-11
U-234	8.29E-11
U-235	7.50E-11
U-236	7.67E-11
U-237	1.68E-14
U-238	7.05E-11
U-239	2.12E-16
U-240	5.11E-15
V-47	2.56E-16
V-48	2.12E-14
V-49	3.00E-16
W-176	3.62E-16
W-177	2.12E-16
W-178	6.35E-16
W-179	8.11E-18
W-181	2.38E-16
W-185	1.06E-15
W-187	1.68E-15
W-188	5.03E-15
Xe-120	5.36E-22
Xe-121	2.68E-21
Xe-122	6.79E-23
Xe-123	8.57E-22
Xe-125	3.32E-22
Xe-127	3.46E-22
Xe-129m	2.89E-23
Xe-131m	1.14E-23
Xe-133	4.29E-23
Xe-133m	3.93E-23
Xe-135	3.43E-22
Xe-135m	5.72E-22
Xe-138	1.68E-21
Y-86	4.14E-15
Y-86m	2.47E-16
Y-87	3.44E-15
Y-88	3.88E-14
Y-90	1.32E-14
Y-90m	8.82E-16
Y-91	7.85E-14
Y-91m	9.70E-17
Y-92	1.59E-15
Y-93	3.70E-15
Y-94	2.47E-16
Y-95	1.41E-16
Yb-162	1.23E-16
Yb-166	6.79E-15
Yb-167	6.08E-17
Yb-169	2.65E-14
Yb-175	6.44E-15
Yb-177	6.08E-16
Yb-178	6.61E-16
Zn-62	4.85E-15
Zn-63	3.26E-16
Zn-65	1.94E-14
Zn-69	2.47E-16
Zn-69m	2.38E-15
Zn-71m	1.41E-15
Zn-72	1.15E-14
Zr-86	3.79E-15
Zr-88	3.17E-14
Zr-89	4.85E-15
Zr-93	2.20E-13
Zr-95	5.20E-14
Zr-97	8.11E-15

Appendix A

Requirement Documents

Text Superscripts	Requirement Documents
CFR Title 10 - Energy	
T.1.1	10 CFR 850.38
CFR Title 29 - Labor	
T.2.1	29 CFR 1910
CFR Title 40 - Protection of Environment	
T.3.1	40 CFR 261.177
T.3.2	40 CFR 264.17(b)
T.3.3	40 CFR 264.314
T.3.4	40 CFR 264.315
T.3.5	40 CFR 268.40–268.49
T.3.6	40 CFR 761.60
***Nevada Administrative Code* (NAC)**	
T.4.1	NAC 444.692(4)
T.4.2	NAC 444.8565
T.4.3	NAC 444.8632
T.4.4	NAC 444.9452
T.4.5	NAC 444.971
DOE Manuals	
T.5.1	DOE M 435.1-1 IV.A
T.5.2	DOE M 435.1-1 IV.G
T.5.3	DOE M 435.1-1 IV.L
T.5.4	DOE M 435.1-1, Definitions - Spent Nuclear Fuel
NNSS Permits and Plans	
T.6.1	Hazardous Waste Permit Number: NEV HW0101, Current Revision
T.6.2	State of Nevada Solid Waste Disposal Site Permit, SW 532, Current Revision
Other Requirements	
T.7.1	“Position Paper for High Moisture Content Waste,” Revision 1, March 2017
T.7.2	Addendum 2 to the “Performance Assessment for the Area 5 Radioactive Waste Management Site at the Nevada Test Site, Nye County, Nevada,” DOE/NV/11718-176-ADD2, 06/2006; table A5.2 second column, 06/27/2006
T.7.3	“USDA Compliance Agreement,” NV-101-NNSS-21
T.7.4	MSTS “Derivation of Nevada National Security Site Waste Acceptance Criteria NCS Limits,” NCSE-RWMC-2020-001, Revision 1, 03/25/2021
T.7.5	“Technical Safety Requirements for Area 3&5 RWMS,” TSR-2156.100, Rev. 8, 05/23/2012
T.7.6	“Plutonium Equivalent Gram (PE-g) Radionuclide Conversion Factors,” SB-CALC-21-RWMC-DSA-001, Revision 1
T.7.7	“Documented Safety Analysis for the NNSS Area 3&5 Radioactive Waste Facilities,” Revision 7 CN 2, Effective Date 03/01/2021
T.7.8	“RWAP Position Paper on the Proper Characterization and Disposal of Sealed Radioactive Sources,” Revision 3, February 2017
T.7.9	“Demilitarization Guidance for Electronic and Ferroelectric Neutron Generators,” 11/27/2012