

Rocky Flats Environmental Technology Site

PRO-908-ASD-004

VERSION 3

ON-SITE TRANSFER AND OFF-SITE SHIPMENT OF SAMPLES

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VERSION CHANGE SUMMARY

Changes have been made to reflect the use of Type A and AP-1 packaging for on-Site transfer and off-Site shipment of Nuclear Materials.

Changes in the roles of ASD Authorized Subcontractor and Traffic and Transportation, allowing ASD Authorized Subcontractor to transfer Radioactive Materials on-Site. ASD Authorized Subcontractor may now ship off-Site samples not exceeding TYPE A quantity packaging requirements. For example, The Type A quantity cannot exceed 1/16th gram of WgPu contaminate no matter what weight or size of the shipped sample. In the case of WgPu or the use of 49 CFR 173.433, this knowledge allows operation within fissile limits.

Site Traffic and Transportation must ship off-Site any samples exceeding TYPE A quantity packaging requirements.

Major Section Changes:

- 5.3.3 Dose Rate Considerations have been updated in steps (2) and (4)
- 8.5 Class 7 Sample Shipments Exceeding Limited Quantity Values

Content changes for this version are contained on the following pages:

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1. PURPOSE

PRO-908-ASD-004, On-Site Transfer and Off-Site Shipment of Samples, implements the Kaiser-Hill on-site and off-site analytical sample transportation program at the Rocky Flats Environmental Technology Site (Site). This procedure provides the instructions for labeling, packaging, transferring, and shipping samples. This procedure is to be used in conjunction with an approved work-control document [e.g., a sampling procedure such as *ST-AS14-SOP001*, "Waste Characterization Sampling," technical procedure, Integrated Work Control Program package, Operations Order, or Sampling and Analysis Plan].

The Kaiser-Hill on-site and off-site sample transportation program **SHALL** be implemented, as defined by this procedure, by all Site contractors, subcontractors, and any other agency representatives. This program is subject to the requirements of *MAN-T91-STSM-001*, Site Transportation Safety Manual (STSM), *PRO-T95-OSTP-002*, Off-Site Transportation Procedure (OSTP), and the *Site Safety Analysis Report* Chapter 7 Site Transportation Controls. Additionally, all transfers of samples containing reportable quantities of nuclear materials are subject to the requirements of *MAN-010-MCA*, Materials Control & Accountability Manual.

2. SCOPE

This procedure provides instructions for on-site transfer and off-site shipment of samples. This procedure begins when the samples have been placed into the sample transfer package and the sample transfer package has been prepared for on-site transfer. Samples that are less than Limited Quantity radioactive material values may be transferred by the hand-carry method and shipped by approved subcontractors in accordance with the requirements in Appendix 4 of the STSM. Samples that exceed Limited Quantity radioactive material values are transferred by and, if required, are shipped off-site by ASD designated subcontractor or the Site Traffic & Transportation Department (Traffic & Transportation). Section 3, Overview provides additional details for the two methods of on-site transfers and two methods of off-site shipments.

Sample transfer and shipping activities at the Site **SHALL** be conducted in accordance with this procedure (*PRO-908-ASD-004*, "On-Site Transfer and Off-Site Shipment of Samples"). This procedure does not address shipments of waste or material that are not defined as samples by Department of Transportation (DOT) or Environmental Protection Agency (EPA) regulations.

Acronyms and definitions of some terms and units that appear in this procedure are given in Appendix 2.

This procedure is written to comply with *MAN-001-SDRM*, Site Documents Requirements Manual, and is controlled through *PRO-1329-DM-03*, Site Document Control.

Other Site program manuals and facility procedures also implement Site infrastructure requirements. For example, transportation activities must also be conducted in compliance with radiological protection, nuclear safety, criticality safety, nuclear materials control, and security and safeguards programmatic requirements. The requirements of this procedure, in conjunction with other Site requirements, are designed to ensure the safe and effective conduct of Site sample-transportation activities.

Nothing in this procedure **SHALL** be interpreted to exempt any package or shipment from applicable DOT, EPA, tribal, state, or local regulation.

3. OVERVIEW

This procedure is used in conjunction with an applicable work-control document for sampling. The activities of this procedure begin after the sample has been placed into the sample transfer package (cooler, paint can, drum, Secondary Container in conjunction with AP-1 cooler etc.) and the sample transfer package has been prepared for on-site transfer. Personnel performing the activities within the scope of this procedure must have specific training. The requirements for packaging and transportation training are contained within Chapter X of the STSM.

There are two methods for transferring samples on-site: by hand-carry and by Traffic & Transportation. Hand-carry requirements are contained in Appendix 4 of the STSM. Hand-carry may include transfer within a vehicle, including on-site transfer of samples within a government or approved vehicle. Except for subcontractors whose contract requires the transport of hazardous material as part of the contract scope, Government-owned hazardous material is not transported in personal vehicles, including leased commercial vehicles. The ASD-authorized Site Sample Team hand-carries samples.

Hazardous material samples are packaged in accordance with the requirements of the STSM. Radioactive materials are packaged in accordance with the requirements of the STSM and the *Site Radiological Control Manual (SRCM)*, as applicable. Radioactive material samples that exceed the Limited Quantity requirements in 49 CFR §173.421 are packaged in accordance with the requirements of the STSM and transported by a ASD designated subcontractor or Traffic & Transportation.

Radioactive materials that are less than or do not exceed the Limited Quantity requirements in 49 CFR §173.421 and §173.422, or do not exceed LSA-II definitions of 49 CFR §173.403, or do not exceed TYPE A quantity packaging requirements in 49 CFR §173.403, §173.410 and §173.412 are shipped off-site through an Analytical Services Division (ASD)-authorized sample shipper. Traffic & Transportation ships hazardous materials that present an extraordinary risk and radioactive materials that exceed TYPE A quantity packaging requirements. Hazardous materials destined for off-site shipment are packaged in accordance with the applicable requirements of 49 CFR §171 through §178 and, if being shipped by air and required by the carrier, the International Air Transport Association (IATA) *Dangerous Goods Regulations (DGRs)*.

4. RESPONSIBILITIES

4.1 Analytical Services Division (ASD)

Upon request, issues a Chain-of-Custody (COC) Form with a unique Report Identification Number (RIN) to initiate specified sample analyses.

Designates on-site and off-site laboratories to perform specified sample analyses.

Authorizes Site Sample Team members and Sample Shippers.

Authorizes sample deliveries to laboratories, including alternate-work-schedule Fridays, Saturdays, Sundays, holidays, or off-hours.

Authorizes on-site locations where samples that do not exceed Limited Quantity radioactive material values are to be taken for off-site shipments.

The ASD Manager or designee **SHALL** be responsible for the maintenance and periodic review of this procedure.

4.2 ASD-Authorized Sample Shipper

Complies with the requirements of this procedure, the OSTP, the STSM, and the applicable requirements of 40 CFR, 49 CFR §171 through §178, and IATA DGRs (if required by the air carrier).

4.3 Sender/Custodian

In this procedure, the Sender/Custodian is defined as that person who offers a sample to a transporter for on-site transfer or to an ASD-authorized sample shipper for off-site shipment. The Sender/Custodian may be someone other than the person(s) who requested a sampling event, performed a sampling task, or packaged a sample.

Complies with the requirements of this procedure and the STSM.

Obtains authorization from ASD in advance for AWS Fridays, Saturdays, Sundays, holidays, or off-hour deliveries in order that Radiological Operations and the ASD-authorized sample shipper can be notified to receive the material.

Ensures samples are collected in accordance with the requirements of an approved work-control document. Documents the work-control document identifier, if required, on the SARF or the COC Form in accordance with *PRO-543-ASD-002*, Initiation, Preparation, and Implementation of Chain-of-Custody Forms. Ensures Samples containing reportable quantities of nuclear materials **SHALL** be collected in accordance with *MAN-010-MCA*, Materials Control & Accountability Manual, and in accordance with applicable Nuclear Material Safety Limits (NMSLs) or Criticality Safety Operating Limits (CSOLs).

The sender/custodian of the samples is responsible for providing the following information in conjunction with the on-site transfer of samples and the off-site shipment of samples:

- A completed Sampling and Analysis Request Form (SARF), when required, submitted to the ASD Office to initiate the required services
- Release Evaluation for the samples **SHALL** be obtained in accordance with *Radiological Safety Practices PRO-1004-RSP-09.08*, Radioactive Material Transfer and Unrestricted Release of Property, Waste and Samples, and applicable Site *Radiological Safety Practices (RSPs)*
- Applicable Radiological Surveys
- Knowledge of any known hazardous material present in the sample **SHALL** be documented on the SARF (if required) and on the COC Form
- For off-site shipments, the Proper Shipping Name, UN Number, and Packing Group as given in 49 CFR §172.101 Table or, if air shipments are required by the carrier, in the IATA *DGRs* **SHALL** be documented on the SARF (if required) and on the COC Form
- Documentation of sample collection in accordance with an approved work-control document
- A completed COC Form and ASD-provided RIN
- Errors and discrepancies corrected on the COC Form prior to relinquishing the samples
- Ensures coordination and completion of the applicable requirements of *ST-AS19-FAC-003* Project Briefing Requirements for the Collection and Transport of Materials at Risk

4.4 Traffic & Transportation

Implements the Site transportation program.

Consults with shippers.

Reviews shipping documentation for:

- (1) DOT-regulated shipments when the shipment exceeds Quantity limitations (passenger aircraft/rail values in Column 9A of 49 CFR §172.101 Table)
- (2) IATA-regulated shipments when the quantity per package exceeds the Maximum Quantity given in Section 4, Column J (passenger and cargo aircraft) of the IATA *DGRs* (current edition)

Ships samples that exceed TYPE A quantity as listed in 49 CFR §173.403, §173.431, §173.432, §173.433, §173.434, §173.435 radioactive material values.

4.5 Transporter (On-Site)

Complies with the requirements of this procedure, the STSM, and other applicable implementing procedures.

4.6 Material Control and Accountability (MC&A)

Maintains control and accountability of reportable nuclear materials.

Approves on-site transfers of reportable nuclear materials.

Prepares accountability-transfer documents (Nuclear Material and Drum Transfer Report [NMDTR], DOE NRC 741) to maintain inventory control of DOE-reportable material.

Reports off-site shipments of reportable nuclear materials to the Nuclear Materials Management and Safeguards System (NMMSS).

5. PREREQUISITES

5.1 Training

Employees performing hazardous-material packaging and transportation operations **SHALL** be trained in accordance with Chapter X of *MAN-791-STSM-001*, Site Transportation Safety Manual.

5.2 Sample Packaging and Labeling

NOTE: *A properly maintained COC is a verifiable set of records that documents the physical protection of a sample or set of samples from the time of collection to the time of sample disposal. A COC Form remains with the sample(s) at all times. This documentation is necessary to ensure that the sample is what it purports to be.*

- (1) Prior to transfer, samples **SHALL** be categorized and characterized for radioactive and DOT hazardous material in accordance with the best available process knowledge, history, and testing requirements of the sample media (e.g., fingerprint analysis, refer to the Overview on Page 33) to meet the intent of the 49 CFR DOT regulations. The COC Form **SHALL** include:
 - Documentation in the "Possible Sample Hazards/Remarks" section, stating whether liquid samples preserved with acids or bases are classified as DOT hazardous material in accordance with 40 CFR §136.3 Table II.
 - Documentation in the "Possible Sample Hazards/Remarks" section of any known DOT hazardous material according to 49 CFR §172.101 Table.
- (2) A completed Sample Label (example shown in Appendix 1) **SHALL** be affixed to each sample container.
- (3) COC Forms **SHALL** be filled out for samples collected for each sampling event and proper custody of samples and COC Forms, **SHALL** be maintained in accordance with *PRO-543-ASD-002*.
- (4) **IF** liquid samples are classified as DOT hazardous material and are to be shipped by air to an off-site laboratory, **THEN** the samples **SHALL** be collected in containers that can withstand an internal pressure that produces a pressure differential of 95 kPa. Documentation that certifies the containers can withstand an internal pressure that produces a pressure differential of 95 kPa is required for the shipper to comply with regulations.
- (5) Samples from different waste streams **SHALL** be placed in different packages to prevent reaction with incompatible samples in case of breakage. Also, samples should not be placed in the same package with empty containers.
- (6) Ensure that Radiological Surveys on each primary sample container, inner packaging, outer packaging comply with the applicable acceptance criteria in Section 5.3 of this procedure. Ensure that the customer numbers or COC sample numbers (RIN bottle numbers) listed on the Radiological Surveys accompanying the samples match the customer numbers or COC sample numbers (RIN bottle numbers) listed on the COC Form. If no customer numbers are used as the sample designators, ensure that "N/A" is entered on the COC Form(s) in the spaces provided for the customer numbers.

5.2 Sample Packaging and Labeling (Continued)

- (7) Ensure that the Maximum Activity of each hand-carry sample package does not exceed the following:
- (A) 10.8 μCi for plutonium radionuclides [i.e., weapons-grade plutonium (WG Pu) 34 years]
- NOTE:** *There is no limit for depleted uranium.*
- (B) 27 μCi for uranium enriched to >5%
 - (C) Activity limits are in accordance with 49 CFR §173.421 for Limited Quantity Packaging, utilizing 49 CFR §173.425 and §173.435
- (8) ~~IF~~ the sample transfer package is a paint can with a friction lid, ~~THEN~~ ensure that the gross weight of 2 pounds, 11 ounces (1220 grams) is not exceeded.
- (9) If required by SRCM Article 412 and *RSP 09.02 of the Site Radiological Safety Practices Manual*, the sample transfer package **SHALL** have a Radioactive Material (RAM) Tag/Label (for on-site use only).
- (10) A Swipe Survey **SHALL** be completed for each primary sample container prior to attachment of a signed-and-dated Custody Seal for all off-site sample shipments and all on-site sample transfers whenever possible.
- (11) For all off-site sample shipments, a signed-and-dated Custody Seal **SHALL** be attached at the cap/container interface after the completion of a Swipe Survey that meets acceptance criteria. For on-site sample transfers a signed-and-dated Custody Seal **SHALL** be attached at the cap/container interface whenever possible or on the container package. A signed-and-dated Custody Seal is not required for the return of samples that are transferred from an on-site laboratory or facility back to the sender/custodian.
- (12) Packaging of all samples containing reportable quantities of nuclear materials that occurs inside the Material Access Area (MAA) **SHALL** be observed by Q-cleared PSAP personnel. Observers **SHALL** complete the Observation portion of the Observation/TSA Scan form and submit it to Nuclear Materials Control (NMC) with the Request for NMDTR form.
- NOTE:** *All personnel who apply or remove tamper-indicating devices (TIDs) or witness TID applications and removals must be authorized in accordance with 4-P-16-SA-TID-001, Tamper-Indicating Devices (TIDs).*
- (13) TIDs **SHALL** be applied in accordance with 4-P-16-SA-TID-001, Tamper-Indicating Devices (TIDs), to primary containers of samples containing reportable quantities of nuclear materials.
- (14) Chain-of-custody seals, when required, **SHALL** be applied to sample coolers being transported out of the PA after they have been moved outside the PA.
- (15) Sufficient compatible absorbent (i.e., vermiculite, or equivalent) **SHALL** be added to sample transfer packages with liquid samples to absorb the volume of the liquid contents.
- (16) Sufficient cushioning **SHALL** be added to sample transfer packages to ensure the contents will not change position within the package during transfer.

5.2 Sample Packaging and Labeling (Continued)

- (17) **IF** 4 ± 2 °C (cool to 4 °C for WIPP) preservation is required, **THEN** Blue Ice, or equivalent **SHALL** be added to the sample transfer package.
- (18) **IF** samples do not exceed Limited Quantity of known DOT Hazard Classes, **THEN** sample transfer packaging and labeling **SHALL** be completed in accordance with an approved work-control document and Appendix 4 of the STSM.

NOTE: *Off-site shipments of samples containing reportable quantities of nuclear materials require Nuclear Materials Accountability (NMA) to obtain an Authorization to Ship form from the receiving facility and to generate a DOE NRC Form 741.*

- (19) When required for sample transfer packages, request a NMDTR from NMC in accordance with *MAN-010-MCA*.
- (20) **IF** the Release Evaluation indicates that the sample transfer package does not constitute an unrestricted release, **THEN** the required sections of the RAM Tag/Label **SHALL** be properly completed to accompany the sample transfer package. The RAM Tag/Label **SHALL** also accompany the sample transfer package for delivery to on-site laboratories when the contents are evaluated as DOE Radioactive material (DOE RAM).

NOTE: *Transfer of a sample package from a sender/custodian to a sample transporter requires signed documentation that the prerequisites of Section 5 have been properly completed by the sender/custodian. This documentation may comprise a completed checklist, affidavit, or other transporting documents that **SHALL** provide traceability to the sample package (i.e., reference to the RIN, COC Form identifier, or other tie-in to the sample identifiers). After the sample transfer occurs, the transporter forwards this documentation to ASD for disposition. In instances where the same individual is both the sender/custodian and sample transporter (e.g., an ASD-authorized Sample Team member or Industrial Hygienist), documentation that the prerequisites of Section 5 have been properly completed by the sender/custodian is unnecessary provided that the sample collection, packaging, and transfer are done in accordance with an approved work-control document.*

- (21) When the sender/custodian and transporter are not the same individual, the sender/custodian **SHALL** provide the transporter signed documentation (e.g., completed checklist, affidavit, or transporting documents) that indicates the prerequisites in this section have been completed when offering samples for transfer.

5.3 Radiological Considerations

5.3.1 Sample Release Evaluation

- (1) Sample Release Evaluations for off-site shipments are utilized for the following:
 - (A) Unrestricted Release for (Department of Energy) DOE materials
 - (B) Determination that the sample does not meet the requirements of Radioactive Material as defined by 49 CFR §173.403
 - (C) Minimizing, deleting, or adding Radiological Survey requirements
 - (D) Minimizing, deleting, or adding laboratory analysis, and utilizing statistics
- (2) Samples that do not meet the Unrestricted Release criteria in Part II of the Release Evaluation **SHALL** have a Radiological Screening Report to determine if they are ≤ 2.0 nCi/g (≤ 70 Bq/g) unless those activities are documented by process knowledge/history. Rad screen results are attached to the appropriate Release Evaluation.

5.3.2 On-Site Radioactive Material Transfer Requirements

NOTE: *If samples are to be managed or forwarded by an off-site shipper, proceed to Section 5.3.3.*

- (1) Dose Rate Surveys (Penetrating Radiation Surveys)
 - (A) Dose Rate Surveys (Penetrating Radiation Surveys) are not required if the contents are known to be ≤ 2.0 nCi/g (≤ 70 Bq/g) in accordance with *RSP 09.02* of the *Site Radiological Safety Practices Manual*. Appendix 4 of the STSM states: "Samples transferred for purpose of analysis **SHALL** be categorized and characterized in accordance with best available process knowledge and available history."
 - (B) The Specific Activity of non-line-generated waste is defined as < 100 nCi/g (< 3700 Bq/g) according to *RSP 09.02* for the practice and performance of Dose Rate Surveys.
 - (C) A Beta-Gamma Dose Rate Survey (Penetrating Radiation Survey) **SHALL** meet the requirements of Appendix 4 of the STSM, which states "Surface dose rate from all internal radionuclides **SHALL NOT** exceed 0.5 mrem/hr (0.005 millisievert/hour [mSv/hr]). Additionally, the requirements of *RSP 09.02* must be fully addressed prior to an on-site transfer.
 - (D) In addition to Step C above, a Neutron Dose Rate Survey (Penetrating Radiation Survey) must be performed in accordance with *RSP 09.02* if the contents are known to be > 100 nCi/g (> 3700 Bq/g). The total dose rate (Beta-Gamma + Neutron) must meet the requirements ≤ 0.5 mrem/hr (≤ 0.005 mSv/hr) of Appendix 4 of the STSM. In addition, the requirements of *RSP 09.02* must be fully addressed prior to an on-site transfer.
 - (E) All on-site transfers of samples containing reportable quantities of nuclear materials **SHALL** be performed in accordance with *MAN-010-MCA*.

5.3.2 On-Site Radioactive Material Transfer Requirements (Continued)

- (2) Removable Contamination Surveys and Total Surface Contamination Surveys
 - (A) Removable Contamination Survey results **SHALL NOT** exceed 20 dpm/100 cm², as stated in Table 2-2 of the SRCM, for loose alpha surface contamination in accordance with *RSP 09.02*. (B) Removable Contamination Survey results **SHALL NOT** exceed 1000 dpm/100 cm², as stated in Table 2-2 of the SRCM, for loose beta surface contamination in accordance with *RSP 09.02*.
 - (C) Total Surface Contamination Survey results **SHALL NOT** exceed the requirements stated in Table 2-2 of the SRCM in accordance with *RSP 09.02*.
 - (D) Contamination Surveys **SHALL** be performed on the sample container in accordance with *RSP 07.01* of the *Site Radiological Safety Practices Manual*, which states that Contamination Surveys **SHALL** be performed "prior to transfer of equipment and material from one Radiological Buffer Area (RBA) to another RBA." This information **SHALL** be applied when necessary to *RSP 09.02*.
 - (E) All on-site transfers of samples containing reportable quantities of nuclear materials **SHALL** be performed in accordance with *MAN-010-MCA*.

5.3.3 Off-Site Radioactive Material Shipment Requirements

(1) General

- (A) **IF** the sample meets the requirements for unrestricted release or Limited Quantity, **THEN** Radiological Surveys **SHALL** be performed if required by and in accordance with the Release Evaluation.
- (B) To ascertain that the total activity of the sample package meets the Limited Quantity requirements of 49 CFR §173.421, it must be determined that all radiological material is located in the sample container.

(2) Dose Rate Surveys

- (A) The Specific Activity of non-line-generated waste is defined as <100 nCi/g (<3700 Bq/g) according to *RSP 09.02* for the purpose of the practice and performance of Dose Rate Surveys.
- (B) A Beta-Gamma Dose Rate Survey (Penetrating Radiation Survey) **SHALL** meet the requirements of 49 CFR §173.421, which states "the radiation level at any point on the external surface of the package does not exceed 0.005 mSv/hr (0.5 mrem/hr)." In addition, the requirements of *RSP 09.02* must be fully addressed prior to an off-site transfer.
- (C) In addition to Step B above, a Neutron Dose Rate Survey (Penetrating Radiation Survey) must be performed if the contents are known to be >100 nCi/g (>3700 Bq/g) in accordance with *RSP.09.02*. The total dose rate (Beta-Gamma + Neutron) must meet the requirements of ≤0.5 mrem/hr (≤0.005 mSv/hr) of 49 CFR §173.421. In addition, the requirements of *RSP 09.02* must be fully addressed prior to an off-site transfer.
- (D) **IF** the dose rates of the package exceeds 0.5 mrem/hour (0.005 mSv/hr) **THEN** a Radiological Engineer in concurrence with ASD Authorized shipper can make a Transport Index determination in accordance 49 CFR §172.403 and step 4 of this subsection (5.3.3).

5.3.3 Off-Site Radioactive Material Shipment Requirements (Continued)

- (3) Removable and Total Surface Contamination Surveys
- (A) All Contamination Surveys **SHALL** meet the requirements of *RSP 09.02*.
 - (B) Removable Contamination Survey results **SHALL NOT** exceed 20 dpm/100 cm², as stated in Table 2-2 of the SRCM, for loose alpha surface contamination in accordance with *RSP 09.02*.
 - (C) Removable Contamination Survey results **SHALL NOT** exceed 1000 dpm/100 cm², as stated in Table 2-2 of the SRCM, for loose beta surface contamination in accordance with *RSP 09.02*.
 - (D) Total Surface Contamination Survey results **SHALL NOT** exceed the requirements stated in Table 2-2 of the SRCM in accordance with *RSP 09.02*.
 - (E) **IF** the external package exceeds the requirements stated in Section 5.3.3 (3) Steps A through D, **THEN** Radiological Engineering may consider the limits specified in 49 CFR §173.443(a) Table 11.
 - (F) Contamination Surveys **SHALL** be performed on the sample container in accordance with *RSP 07.01*, which states that Contamination Surveys **SHALL** be performed "prior to transfer of equipment and material from one RBA to another RBA." This information **SHALL** be applied when necessary to *RSP 09.02*.
 - (E) All off-site shipments of samples containing reportable quantities of nuclear materials **SHALL** be performed in accordance with *MAN-010-MCA*.

(4) Dose Rate Special Considerations

- (A) Any radioactive sample package dose rate that exceeds 0.35 µSv/hr (0.035 mrem/hour) shall not be received in T-130A without being registered in the Building T-130A Operational Inventory Control, per *ST-AS19-FAC-005*.
- (B) Any radioactive sample package dose rate that is less than or equal to 0.005 mSv/hr (0.5 mrem/hour) meets the dose rate requirements of Appendix 4 of STSM for hand carried items and meet the dose rate requirements of Limited Quantity per 49 CFR §173.421.
- (C) **IF** any radioactive sample package dose rate that is greater than 0.005 mSv/hr (0.5 mrem/hr) but less than or equal to 0.5mSv/hr (50mrem/hr) exceeds the dose rate requirements of Appendix 4 of STSM for hand carried items and exceeds the dose rate requirements of Limited Quantity.

THEN only ASD-designated subcontractors (see section 6.1) or Traffic Management authorized carrier/Site Trucking Operations (with management approval) may transport this sample package.

- (D) **IF** any radioactive sample package dose rate that is greater than 0.5 mSv/hr (50 mrem/hr) but less than or equal to 2 mSv/hr (200 mrem/hr) exceeds the dose rate requirements of Appendix 4 of STSM for hand carried items and exceeds the dose rate requirements of Limited Quantity.

THEN only ASD-designated subcontractors (see section 6.1) or Traffic Management authorized carrier/Site Trucking Operations (with management approval) may transport this sample package.

NOTE: *ASD may not be authorized to ship by air any sample package meeting the dose rates listed in step (D) above.*

5.3.3 Off-Site Radioactive Material Shipment Requirements (Continued)

EXCERPT FROM 49CFR §172.403

Transportation Index (TI)	Maximum radiation level at any point on the external surface	Label Category ¹
0 ²	Less than or equal to 0.005 mSv/h (0.5 mrem/hr)	WHITE-I
More than 0 but no more than 1	Greater than 0.005 mSv/hr (0.5 mrem/hr) but less than or equal to 0.5 mSv/hr (50 mrem/hr)	YELLOW-II
More than 1 but no more than 10	Greater than 0.5 mSv/hr (50 mrem/hr) but less than or equal to 2 mSv/hr (200 mrem/hr)	YELLOW-III
More than 10	Greater than 2 mSv/hr (200 mrem/hr) but less than or equal to 10 mSv/hr (1000 mrem/hr)	YELLOW-III (must be shipped under exclusive use provisions see 173.441 (b) of 49CFR)

¹ Any package containing a "highway route controlled quantity" (173.403 of 49CFR) must be labeled as RADIOACTIVE YELLOW-III.

² If the measured TI is not greater than 0.05, the value may be considered to be zero

5.4 Radiological Labeling

Radiological labeling of sample containers SHALL be performed in accordance with SRCM *Article 412*, Radioactive Material Labeling, *Article 423*, Transportation of Radioactive Materials, or as determined by a Sample Release Evaluation.

5.5 Criticality Safety

Nuclear Material Safety Limits (NMSLs) or Criticality Safety Operating Limits (CSOLs) govern transfers involving fissionable material. All such transfers SHALL strictly comply with applicable NMSLs or CSOLs in accordance with Criticality Safety programmatic requirements. The DOT 7A, Type A and AP-1 packages and their associated secondary containers must be handled in accordance with NMSL 03-0023 and the criticality safety evaluation BIK-186.

At the first indication that any NMSL or CSOL has been exceeded, follow the instructions and requirements of *PRO-T44-SWCSI-140*, Management of Nuclear Criticality Safety Program Non-Compliances.

6. ON-SITE SAMPLE TRANSFERS

Samples may be transferred by two methods: hand-carry and Traffic & Transportation.

6.1 Hand-Carry Sample Transfers

Samples that do not exceed 2 nCi/g radioactive material values can be transferred on-site by the hand-carry method in accordance with STSM Appendix 4, Radioactive Material On-Site Hand-Carry Requirements.

ASD-designated subcontractors may transfer samples exceeding 2 nCi/g values provided that the requirements of the *Site Safety Analysis Report*, Chapter 7 Site Transportation Controls are met.

Transporter

- [1] When the transporter and the sender/custodian are not the same individuals, obtain signed documentation (e.g., completed checklist, affidavit, or transporting documents) from the sender/custodian that indicates the prerequisite requirements of Section 5 have been completed.
- [2] Ensure by review of the COC Form (or copy of the COC Form) and Radiological Survey results that the prerequisite requirements cited in Sections 5.2 (1), (3), (5), (6), (7), and (9) have been completed by the sender/custodian.
- [3] Obtain documentation (e.g., SARF, COC Form) from the sender/custodian regarding DOT Hazard Class Material other than radioactive materials.
- [4] Obtain documentation from the sender/custodian that certifies primary sample containers can withstand an internal pressure that produces a pressure differential of 95 kPa, when required, for the shipper to comply with regulations.

NOTE : *Whenever a Nuclear Material Drum Transfer Report (NMDTR) and/or TID is required for sample transfer, both the sender and receiver must perform the transfer checks (e.g., identification numbers, number of items, TID numbers, and TID integrity) and sign the NMDTR, in accordance with MAN-010-MCA, Materials Control & Accountability Manual, Chapters 5.2 and 5.3.*

- [5] **IF** samples are transferred out of the Material Access Area (MAA),
THEN:
 - [A] Verify that a tamper-indicating device (TID) is applied on the sample transfer package in accordance with 4-P16-SA-TID-001.
 - [B] Verify that a NMDTR is completed in accordance with *MAN-010-MCA* and accompanies the sample transfer package containing reportable nuclear material.
 - [C] Ensure transfer checks are performed in accordance with *MAN-010-MCA*.
 - [D] Verify that the required sections of the RAM Tag/Label have been properly completed and ensure that the RAM/ Tag/Label is attached to the sample transfer package.
 - [E] Ensure that approval from Building 559 Radiological Laboratory has been obtained for sample receipt, if required.

6.1 Hand-Carry Sample Transfers (Continued)

NOTE 1: *If the COC Form is enclosed in the outer sample transfer package with a custody seal applied, the transporter does not take custody of the samples and COC Form, and serves only a transport function to the laboratory destination. The laboratory accepts sample custody upon receipt of samples.*

NOTE 2: *The transfer of Waste Isolation Pilot Plant samples requires that the COC Form be enclosed in a cooler with a custody seal.*

NOTE 3: *For excess samples being returned to the sender/custodian from an on-site analytical laboratory or facility, a copy of the original COC Form, annotated to indicate which samples are being returned, is acceptable documentation for this type of transfer.*

[6] **IF** the COC Form has not been enclosed in the outer package with a custody seal applied or TID, **THEN** take custody of the samples and COC Form by signing and dating the COC Form in accordance with PRO-543-ASD-002.

[7] Hand carry samples on-site in accordance with Appendix 4 of the STSM. Hand-carry includes on-site transfer of samples with a government or approved vehicle. Except for subcontractors whose contract requires the transport of hazardous material as part of the contract scope, Government-owned hazardous material **SHALL NOT** be transported in personal vehicles, including leased commercial vehicles.

IF a vehicle is used,
THEN the on-site transfer is subject to the requirements of Chapters VIII and XIII of the STSM.

[8] **IF** a NMDTR is required for the transfer,
THEN the transporter submits the NMDTR to the receiver for signature and retains a copy. Disposition the NMDTR in accordance with MAN-010-MCA.

6.2 Traffic & Transportation Transfers

Traffic & Transportation transfers sample packages that exceed 2 nCi/g radioactive material values and sample packages of materials that present an extraordinary risk.

NOTE: *ASD-designated subcontractors may transfer samples exceeding 2 nCi/g values provided that the requirements of the Site Safety Analysis Report, Chapter 7 Site Transportation Controls are met.*

Transporter

- [1] When the transporter and the sender/custodian are not the same individuals, obtain signed documentation (e.g., completed checklist, affidavit, or transporting documents) from the sender/custodian that indicates the prerequisite requirements of Section 5 have been completed.
- [2] Ensure by review of the COC Form (or copy of the COC Form) and Radiological Survey results that the prerequisite requirements cited in Sections 5.2 (1), (3), (5), (6), (7), and (9) have been completed by the sender/custodian.
- [3] Verify the following:
 - [A] That a tamper-indicating device (TID) has been applied on the sample transfer package in accordance with 4-P16-SA-TID-001.
 - [B] That a NMDTR has been properly completed and accompanies the sample transfer package containing reportable nuclear material.
 - [C] That the required sections of the RAM Tag/Label have been properly completed and ensure that the RAM/ Tag/Label is attached to the sample transfer package
 - [D] That approval from Building 559 Radiological Laboratory has been obtained for sample receipt, if required
- [4] Transfer the sample packages in accordance with the requirements of the STSM and applicable Traffic & Transportation procedures to the designated on-site laboratory or to the ASD-authorized sample shipper's on-site facility for sample on-site transfer or off-site shipment.
- [5] **IF** a NMDTR is required for the transfer,
THEN the transporter submits the NMDTR to the receiver for signature and retains a copy.
Disposition the NMDTR in accordance with *MAN-010-MCA*.

7. INSTRUCTIONS FOR RECEIPT OF SAMPLES FOR OFF-SITE SHIPMENT

Prior to receiving or handling of samples for the intent of packaging and shipment to off-site laboratories, it is necessary to review the following elements of the shipment data packet to ensure that the required documentation and verification of the required information are complete.

Any known sample of radioactive material that exceeds the requirements in 49 CFR §173.403, §173.410 and §173.412 (TYPE A package requirements) are shipped by Traffic & Transportation.

7.1 Review of Radiological Survey Reports

ASD-Authorized Sample Shipper

- [1] Ensure that Radiological Survey(s) results accompany each sample that does not meet Unrestricted Release criteria or other exemption that has been established by the Release Evaluation.

7.2 Review of Radioactive Material (RAM) Tag/Label

- [2] Perform the following checks of the RAM Tag/Label:
 - [A] Verify that the description area of the tag has been completed.
 - [B] Verify that "Packaged by" section of the tag has been completed.
 - [C] Verify that "Date Packaged" section of the tag has been completed.

7.3 Review of Release Evaluation

- [3] Perform the following checks for Part I of the Release Evaluation:
 - [A] Verify that there is a Release Evaluation Number assigned by the Radiological Engineer.
 - [B] Verify that the Release Evaluation has an expiration date and it has not expired.
 - [C] Verify that all information is filled in and that there is a laboratory name and address.
 - [D] Determine if the samples were ever located in a Radiological Materials Management Area, Radiological Management Area (RMA), Soil Contamination Area, Contamination Area, or High Contamination Area, or have ever been in contact with DOE radioactive materials.
 - [E] Under the "Acknowledgment" section, ensure that there is a sender/custodian signature with employee number, date, and telephone number.
- [4] Perform the following checks for Part II of the Release Evaluation:
 - [A] Verify compliance with all instructions and restrictions.
 - [B] Verify the "Specific Requirements" and/or "Comments" sections.
 - [C] **IF** the samples contain DOE radioactive materials,
THEN verify that there are two different signatures on the Release Evaluation from Radiological Engineers who are authorized for sample releases by the Authorized Radiological Engineers List distributed by Radiological Safety, and
THEN verify that their names and employee numbers are legible.

IF the signature of a Radiological Engineer is not legible,
THEN verify the signature by contacting the telephone extension on the Release Evaluation.

7.4 Review of 49 CFR Radiological Screening (Rad Screen) Results

- [5] Review rad screen results (if required) or a Release Evaluation to determine proper sample storage and whether samples do not exceed the DOT Limited Quantity radioactive material shipping values.

7.5 Review of Sample Integrity

- [6] Perform the following checks of sample integrity.
- [A] The integrity of the sample container has been maintained and is in good condition.
 - [B] A Custody Seal has been applied to each sample container in the proper manner.
 - [C] The RIN, event, and container number on each sample-container label corresponds to the assigned RIN, event, and container number on the COC Form.
 - [D] The sample-container sizes and types for the samples correspond to the information on the COC Form.
 - [E] If required, the sample preservation has been completed (e.g., Blue Ice is present) and documented correctly.

7.6 Review of Chain-of-Custody (COC) Form

- [7] Review information on the COC Form, looking for omissions as well as errors in accordance with PRO-543-ASD-002.
- [8] Ensure that the COC Form has the following:
- [A] The date and time of sample collection entered for each sample
 - [B] The signature(s) of the sampler(s) and date signed
 - [C] A RIN and charge number
 - [D] A completed "Sample Originator" section

NOTE: *An ASD-authorized sample shipper does not assign laboratory destinations. Laboratory destinations are obtained from an ASD Project Lead by the sender/custodian.*

- [E] The laboratory destination is identified and consistent with the laboratory destination on the Release Evaluation
- [F] An associated analysis and turnaround time for each sample
- [G] Any areas where sample information could be entered that are not used are lined out, initialed, and dated by the person (usually the sampler) filling out the sample information
- [H] Any correction made by a single line drawn through the mistake has the correction written next to the error and the correction initialed and dated
- [I] Any conditions of sampling or sample matrix that might affect analysis (such as the lot number of filters used to collect air effluent samples) are noted in the "Comments" section
- [J] Any conditions of sample preservation or sample matrix that might affect classification of the samples for compliance to DOT regulations for shipment are noted in the "Hazards Remarks" section

7.7 Resolution of Discrepancies in Samples and COC Forms

- [9] Resolve problems with labeling, filling out COC Forms, sample numbering, or sample identification information with the samplers or the sample custodian/customer at the time the sample is submitted for shipment, if possible, but always prior to receipt at the shipping area. All changes to the sample information **SHALL** be documented on the Sample Label and/or COC Form, initialed, and dated.
- [10] Resolve other problems with samples (such as incorrect sample container, incorrect sample volume, no custody seal applied, no Preservative used, etc.) with the customer prior to receipt of the sample.
- [11] When applicable, document and process nonconformances in accordance with *1-A65-ADM-15.01*, Control of Nonconforming Items. When a nonconformance occurs, a report **SHALL** be filed in according with the requirements of *1-D97-ADM-16.01*, Occurrence Reporting Process.

7.8 Receipt of Samples

- [12] If samples contain reportable quantities of nuclear materials, **THEN** the receiver must perform transfer checks in accordance with *MAN-010-MCA*.
- [13] **IF** samples require rad screen analyses and they have not been requested, **THEN** refuse to receive and store samples.

When all the conditions cited above for sample receipt have been met, the samples may be received for the preparation of off-site shipment as follows:

- [14] Ensure that the person relinquishing the sample custody and the person taking custody both sign the COC Form at the time transfer of sample custody occurs.
 - [A] The person submitting the samples **SHALL** relinquish the samples to the person taking custody by signing the COC Form with the date and time in the "Relinquished By:" block.
 - [B] The person taking custody **SHALL** ensure that the person who signed the COC Form is the person that relinquished the samples.
 - [C] The person taking sample custody **SHALL** sign the COC Form with the date and time in the "Received By:" block.
- [15] Ensure that the date and time of the transfer is recorded on the COC Form.
- [16] Provide a copy of the COC Form to the sender/custodian.
- [17] **WHEN** samples are not shipped immediately, **THEN** ensure that the samples and COC Forms are maintained in a secured repository (e.g., locked refrigerator) in accordance with *PRO-543-ASD-002*.
- [18] Store samples, if required, as follows:
 - [A] Samples **SHALL** only be held in short-term storage pending preparation and receipt of documentation (e.g., rad screen results) for shipment.
 - [B] Samples in the custody of the receiving station that await packaging and shipment to the assigned laboratory and meet unrestricted release criteria **SHALL** be secured in a non-radiological refrigerator if 4 ± 2 °C (cool to 4 °C for WIPP) preservation is required, or a cabinet if temperature preservation is not required.
 - [C] Samples being stored as controlled DOE radioactive material **SHALL** be controlled and secured in an authorized and properly posted RMA in accordance with the limits of the RMA, and refrigerated, if required.
- [19] Ensure that access to the secured storage is controlled to only authorized personnel.

8. OFF-SITE SHIPMENT OF SAMPLES

8.1 Requirements for Off-Site Sample Shipments

NOTE

Nonconformance with the requirements of this section may be a violation of state and/or Federal law and may subject each individual involved with the nonconformance to fine and/or imprisonment.

NOTE

*A RAM Tag/Label signed by Radiological Operations **SHALL** be used only for on-site transfers. Samples **SHALL NOT** be shipped off-site with a RAM Tag/Label.*

NOTE

Only properly trained DOT HAZMAT employees may offer for transport any shipment that is a hazardous material.

8.1.1 Shipping Memos (RFP F-1500.01)

Samples classified as DOT Hazardous Material that are shipped off-site by ASD designated shipper or Traffic Management require a properly completed Shipping Memo (RF F-1500.01) generated by the shipper. Instructions for completing the Shipping Memo are given in Appendix 1 of the OSTP ("Shipping Memo RFP F 1500.01 Instructions").

8.1.2 General Requirements for Off-Site Sample Shipments

- (1) An ASD-authorized sample shipper **SHALL** make sample shipments from an approved shipment location. Traffic & Transportation is to be notified by ASD of Site sample shipping locations. ASD authorized sample shippers **SHALL NOT** create a shipment package that has a total activity exceeding TYPE A quantity stipulated in 49 CFR §173.433, 434 and 435.

NOTE: *Identifying DOT Hazard Classes and Packing Groups begins at a Sender/Custodian level through process history and previous analytical results prior to the sampling event. Fingerprint analysis must be performed if the sample is an unknown material or contains known chemicals or hazardous materials listed in 49 CFR§172.101. Fingerprint analysis helps to identify DOT Hazard Classes by testing for compatibility, physical appearance, specific gravity, combustibility, presence of water, and miscibility and reactivity with water.*

- (2) An ASD-authorized sample shipper **SHALL** perform an evaluation of documentation to determine if the shipment of a sample requires classification for a DOT Hazard Class to meet regulatory compliance with 49 CFR§171 through §178 and, if required by the air carrier, applicable IATA DGRs.
- (3) Samples **SHALL** be identified, labeled, packaged, and marked with DOT Hazard Classes, and described in accordance with the most current requirements of 49 CFR §171 through §180, and, if to be shipped by air, the IATA DGRs. The shipper **SHALL** follow the requirements of 49 CFR §171.11 when preparing and executing shipments under the provisions of the International Civil Aviation Organization Technical Instructions.

8.1.2 General Requirements for Off-Site Sample Shipments (Continued)

- (4) Sample containers for liquids to be shipped by air **SHALL** meet the internal-pressure requirement of 95 kPa (49 CFR §173.27). Documentation that certifies the containers can withstand an internal pressure that produces a pressure differential of 95 kPa **SHALL** be provided to the shipper for the shipper to comply with regulations.
- (5) An evaluation **SHALL** be made to determine if there is a hazardous material Hazard Class association pertaining to the shipment as required by 49 CFR §172.101 Table and, if required by the air carrier, applicable IATA DGRs.
- (6) Packages **SHALL** meet Drop and Stacking Test criteria for Limited Quantity packaging. (i.e., IATA DGRs and 49 CFR).
- (7) Coolers that meet DOT specifications for transport may be reused.
- (8) For internal packaging, only new packaging **SHALL** be procured and used for shipment of samples from the Site.
- (9) All previous labels **SHALL** be removed or covered.
- (10) Hazardous material packages **SHALL** be properly marked and labeled in accordance with 49 CFR §172 and, if required by the air carrier, applicable IATA DGRs.

NOTE: A Site Preparation for Off-Site Shipment Checklist is prepared for each off-site shipment (see Appendix 2 of the OSTP, "Site Preparation for Off-Site Shipment Checklist"). The shipping package includes classification of each item and DOT Hazard Classes and EPA Waste Codes, if applicable. This information may be listed on the COC Form or a separate attachment.

- (11) No shipment of hazardous material packages **SHALL** be made without concurrence of the Traffic Manager or designees for the following:
 - DOT-regulated shipping packages that exceed Quantity limitations (passenger aircraft/rail values in Column 9A of 49 CFR §172.101 Table)
 - IATA-regulated shipping packages that exceed the Maximum Quantity given in Section 4, Column J (passenger and cargo aircraft) of the IATA DGRs (current edition).
- (12) For samples containing reportable quantities of nuclear materials, NMA **SHALL** obtain authorization to ship and prepare DOE NRC Form 741 (refer to *MAN-010-MCA*). TIDs are required for off-site shipments of reportable materials.
- (13) Outbound packages **SHALL** bear a properly completed Shipping Label, or equivalent.
- (14) **IF** a shipment is delayed and the sample-holding time, preservation, or analysis turnaround time will be jeopardized,
THEN ASD SHALL be notified.
- (15) An authorized carrier **SHALL** be used for off-site shipments.
- (16) WIPP sample shipping packages **SHALL** contain appropriate blank samples to detect any VOC cross contamination.

8.2 Evaluation of Documentation for Determining Hazard Class, Division, and Packing Group

NOTES

Traffic Management ships hazardous materials that present an extraordinary risk. Hazardous materials destined for off-site shipment are packaged in accordance with the applicable requirements of 49 CFR §171 through §178 and, if being shipped by air and required by the carrier, the International Air Transport Association (IATA) Dangerous Goods Regulations (DGRs). Identifying DOT Hazard Classes and Packing Groups begins at a Sender/Custodian level through process history and previous analytical results prior to the sampling event. Fingerprint analysis must be performed if the sample is an unknown material or contains known chemicals or hazardous materials listed in 49 CFR §172.101. Fingerprint analysis helps to identify DOT Hazard Classes and risks by testing for compatibility, physical appearance, specific gravity, combustibility, presence of water, and miscibility and reactivity with water.

An evaluation of documentation is crucial to determine if the shipment of a sample will be in regulatory compliance with 49 CFR §171 through §178 and, if required by the air carrier, applicable IATA DGRs.

ASD-Authorized Sample Shipper

- [1] Evaluate the following documentation to determine the DOT Hazard Class or Division:
 - [A] Radiological Surveys of packages meet the requirements of the SRCM and appropriate RSPs.
 - [B] SARF (as required, according to PRO-543-ASD-002) for waste stream information, EPA Codes, and any known DOT hazardous material in accordance with 49 CFR §172.101 Table.
 - [C] COC Form for information on whether preserved samples are classified as DOT hazardous material in accordance with 40 CFR §136.3 Table II and information is present on known DOT hazardous material in accordance with 49 CFR §172.101 Table.

NOTE: *An Authorized Radiological Engineer must prepare a Radiological Release Evaluation and complete the final signature approval prior to the off-site shipment of samples.*

- [D] A completed Release Evaluation (i.e., one with the final Radiological Engineer signature) for documented process history information and rad screen results, if required. DOT Calculations of Determination, if required, **SHALL** be prepared by a Site Authorized Radiological Engineer and attached to the Release Evaluation.
- [2] **IF** the documentation above is inadequate or additional information is required, **THEN** contact the sender/custodian for further information.
- [3] For Regulated Materials, complete the Off-Site Shipment Checklist given in Appendix 2 of the OSTP ("Site Preparation for Off-Site Shipment Checklist") to document the evaluation process and the determination of the Hazard Class.

IF the sample has been determined to exceed the DOT Quantity limitation or IATA Maximum Quantity given in Section 8.1.2 (11), **THEN** proceed to section 8.5
- [4] Retain the Shipment Checklist and supporting documentation in the shipping documentation files.

8.3 Regulated and Non-Regulated Shipments by Common Carrier

NOTE

Subcontractors are prohibited from receiving or attempting to offer for shipment any known radionuclides in which activity levels are determined to exceed the DOT Class 7 Limited Quantity established in 49 CFR §178.421. ASD designated and authorized shippers or Traffic Management must ship these samples.

ASD-Authorized Sample Shipper

- [1] Complete evaluation and documentation of any DOT Hazard Class according to Section 8.2 of this procedure.
IF the sample has been determined to meet Limited Quantity definition of a DOT Hazard Class, **THEN** proceed to section 8.5
- [2] Control radioactive samples in an RMA and control all samples with proper custody prior to shipment.
- [3] **IF** the sample has been determined to be a Limited Quantity Hazard Class 7 shipment, **THEN** a typed Shipping Memo (RFPF-1500.01) **SHALL** be attached with the sample. The Shipping Memo will be used only for inventory control.
- [4] **IF** the sample has been determined to be Limited Quantity Class 7 shipment, **THEN** prepare a Radioactive Shipment Preparation Certification Form (RF-46404) (see Appendix 4 in the OSTP, "Radioactive Shipment Preparation Certification Form, RF-46404").
Type the Shipping Memo and the Air Label numbers on the Radioactive Shipment Preparation Certification Form.
- [5] **IF** the sample package has been determined to exceed the Limited Quantity Hazard Class 7 shipment or IATA Maximum Quantity given in the IATA DGRs, **THEN** proceed to section 8.5.
IF the sample has been determined not to exceed the Limited Quantity Hazard Class 7 shipment or IATA Maximum Quantity given in the IATA DGRs, **THEN** proceed to Step [6] on the following page.
Ensure that the Traffic shipping packet includes all the following information, if required:
 - [A] Off-Site Shipment Checklist ("Site Preparation for Off-Site Shipment Checklist" given in Appendix 2 of the OSTP) that has been reviewed by Traffic & Transportation
 - [B] Radioactive Shipment Preparation Certification Form (white copy)
 - [C] Shipping Memo (white copy)
 - [D] Radiological calculations from Radiological Engineering
 - [E] Radiological Survey Forms from Radiological Operations
 - [F] Reports of rad screen results from on-site laboratories
 - [G] Copy of proposed Air Label
 - [H] The Air Label number is on both the Shipping Memo and the Radioactive Shipment Preparation Certification Form

8.3 Regulated and Non-Regulated Shipments by Common Carrier (Continued)

- [6] Prepare a shipper's shipping packet and ensure that the packet includes all the following information, if required, including signatures, dates, and times, as:
- [A] Off-Site Shipment Checklist (Site Preparation for Off-Site Shipment Checklist" given in Appendix 2 of the OSTP)
 - [B] Radioactive Shipment Preparation Certification Form (copy)
 - [C] Shipping Memo (copy)
 - [D] Radiological calculations from Radiological Engineering (copy)
 - [E] Radiological Survey Forms from Radiological Operations (copy)
 - [F] Reports of rad screen results from on-site laboratories (copy)
 - [G] The Air Label number is on the Radioactive Shipment Preparation Certification Form
 - [H] COC Form (copy)
- [7] Ensure that sample packaging is in accordance to 49 CFR §171 through §178 and, if required by the air carrier, applicable IATA *DGRs*.
- Package the primary sample container as follows:
- [A] The bagged glass sample container is wrapped in bubble wrap.
 - [B] Samples are placed in an internal large plastic bag to provide secondary containment.
 - [C] Sample containers are placed into the approved outer package in an upright position except vials for volatile organic compound analytes. Vials for volatile organic compound analytes are placed in an inverted position.
 - [D] Add to the outer package an adequate amount of compatible absorbent as follows:
 - IF** the shipment is not DOT regulated (i.e., no Hazard Class association),
THEN provide an adequate amount of absorbent to ensure that the contents will not leak through the outer shipping container during normal transportation conditions.
 - IF** the shipment is DOT regulated,
THEN comply with applicable sections of 49 CFR §171 through §178 and, if required by the air carrier, applicable IATA *DGRs* for packaging requirements.
 - [E] Add a minimum amount of compatible cushioning to the package to prevent shifting of and damage to sample containers during transport.
 - [F] **IF** 4 ± 2 °C (cool to 4 °C for WIPP) preservation is required,
THEN add sufficient Blue Ice packs, or equivalent to the shipping container to maintain preservation temperature through laboratory receipt.
- [8] Ensure that sample-package labeling is in accordance to 49 CFR §171 through §178 and, if required by the air carrier, applicable IATA *DGRs*.
- Label the outer sample packaging as follows:
- [A] Place the Shipping Memo copy (packing slip), if required, and the COC Form (relinquished in accordance with *PRO-543-ASD-002*) in a sealed plastic bag.

8.3 Regulated and Non-Regulated Shipments by Common Carrier (Continued)

- [B] **IF** a sample is a Limited Quantity Class 7 shipment,
THEN place a Caution Radioactive Material Label in a clear and unobstructed view on the outside of the bag with the Shipping Memo and COC Form.
- [C] **IF** a sample is a Limited Quantity Class 7 shipment and it is shipped either by air or ground transportation,
THEN place a label on the plastic bag next to, but not touching, the Radioactive Material Label according to IATA *DGRs* (if required by the air carrier) when the shipment is by air and according to 49 CFR §171 through §178 when the shipment is by ground transportation.
- [D] Tape inside the outer package the sealed plastic bag that contains the labels, the Shipping Memo, COC Form, and any other required documentation. Close and secure the outer package.

NOTE: *Under the IATA DGRs, an Emergency Telephone Number is not required for Limited Quantity shipments.*

- [E] **IF** a sample is Limited Quantity Class 7 shipment,
THEN type the appropriate IATA *DGRs* (if required by the air carrier) or 49 CFR §171 through §178 statement on the Air Label or place a label in an area adjacent to the Air Label on the outer shipping package.
- [F] **IF** a sample has been determined to be a hazardous material in a Hazard Class other than Limited Quantity Class 7,
THEN comply with 49 CFR §172 through §180 and applicable sections of the *DGRs* for the appropriate labeling regulations for the hazardous material identified.
- [G] Attach an appropriately completed Air Label to the outer shipping package.
- [H] Place the signed and dated custody seals in two locations, sealing the outer package lid so that subsequent tampering **SHALL** become evident.
- [I] Wrap strapping tape around the cooler or outer package lid in two locations to secure the lid.
- [J] Place a label that states contractor "for United States Department of Energy" and another label that states "Environmental Sample(s)."
- [K] Place the following labels on the outside of the cooler or outer package in the appropriate locations in accordance with 49 CFR §171 through §178 and IATA *DGRs* (if required by the air carrier) marking and labeling requirements:
- "This Side Up" and "Fragile" on the top and two sides
 - "↑" according to appropriate packaging orientation requirements for liquid samples
 - "Heavy Weight" on two opposite sides if the cooler or outer package is over 65 pounds
- [9] Ship packages from an approved Site location by an approved carrier.

8.4 Sample Shipments to a Local Laboratory by Government or Subcontractor Vehicle

NOTE

Any 49 CFR-regulated materials that require placarding or exceed Limited Quantity values are strictly prohibited from being transported by other than approved commercial carriers.

8.4.1 Requirements

- (1) Only samples for analytical analysis that are ≤ 2.0 nCi/g (≤ 70 Bq/g) and have quantities of hazardous material that do not exceed Limited Quantity values **SHALL** be transported to approved local laboratories (i.e., those in the Denver Metro Area) by Government or Subcontractor vehicle.
- (2) A subcontractor may transport samples off-site only if their contract requires the transport of samples with hazardous material as part of the contract scope of work in compliance with applicable requirements of Chapter VIII of the STSM.
- (3) Samples **SHALL NOT** be transported off-site in personal vehicles.

8.4.2 Instructions

ASD-Authorized Sample Shipper

- [1] Label and package the approved samples in accordance with instructions in Section 8.3 of this procedure.

NOTE 1: *The packaged cooler **SHALL NOT** be placed in the cab of a truck or any passenger areas of the transporting vehicle.*

NOTE 2: *Elastic cords **SHALL NOT** be used to secure coolers in vehicles.*

- [2] Place the packaged cooler in the cargo area of a vehicle and firmly secure to prevent any type of movement during normal transportation.
- [3] Upon delivery of the sample package, relinquish the samples and custody by signing and dating the COC Form in accordance with *PRO-543-ASD-002*.

8.5 Class 7 Sample Shipments Exceeding Limited Quantity But Not Exceeding TYPE A Quantity

8.5.1 SHIPPING DEFINITIONS per 49 CFR § 173.403

A_2 means the maximum activity of the Class 7 (radioactive) material, other than special form, LSA or SCO, permitted in a TYPE A package. These values are either listed in 49CFR §173.435 or derived in accordance with the procedure prescribed in 49CFR §173.433.

Radioactive material means any material having a specific activity greater than 70 Bq per gram (2 nanocuries/gram)

Limited quantity of Class 7 (radioactive material) means a quantity of Class 7 material not exceeding the materials packaging limits specified in 49CFR §173.425 and conforming with the requirements of 49CFR §173.421

Examples of limited quantities max values

SOLIDS (normal form): $(E-3) \times (A_2 \text{ value}) = 10.8$ microcuries for WgPu

OTHER LIQUIDS $(E-4) \times (A_2 \text{ value}) = 1.08$ microcuries for WgPu

LSA-II means

(i) Water with tritium concentration up to 0.8 TBq/liter (20.0 Ci/liter); or

(ii) Material in which Class 7 (radioactive) material is distributed throughout and the average specific activity does not exceed $(E-5)(A_2/\text{gram})$ for solids and gases, and $(E-5)(A_2/\text{gram})$ for liquids.

Examples of LSA-II max values

SOLIDS (normal form): $(E-4) \times (A_2 \text{ value}) = 1.08$ microcuries/gram for WgPu

OTHER LIQUIDS: $(E-5) \times (A_2 \text{ value}) = 0.108$ microcuries for WgPu

TYPE A PACKAGE means a packaging that, together with its radioactive contents limited to the A_1 or A_2 as appropriate, meets the requirements of 49CFR §173.410 and §173.412 and is designed to retain the integrity and containment and shielding required by this part under normal conditions of transport as demonstrated by the tests set forth in 49CFR §173.465 or §173.466, as appropriate. A Type A package does not require Competent Authority Approval

Determine the proper shipping classification from the definitions listed above.

IF the sample package radiological total activity is determined not to exceed Limited Quantity values

THEN complete the appropriate steps of section 8.1 thru 8.4

An ASD-authorized sample shipper **SHALL** make sample shipments from an approved shipment location. Traffic & Transportation is to be notified by ASD of Site sample shipping locations. ASD authorized sample shippers **SHALL NOT** create a shipment package that has a total activity exceeding TYPE A quantity stipulated in 49CFR §173.433, 434 and 435. For shipments which would exceed these limits proceed with section 8.6.

8.5 Class 7 Sample Shipments Exceeding Limited Quantity But Not Exceeding TYPE A Quantity (Continued)

8.5.2 Prerequisites for Air Shipments

- ASD **SHALL** be notified if a shipment is delayed and the sample-holding time, preservation, or analysis turnaround time will be jeopardized.
- An authorized ASD designated subcontractor or carrier **SHALL** be used for off-site shipments.
- All sample containers that will be shipped with radioactive material liquids by ground or by air **SHALL** meet the internal-pressure requirement of 95 kPa (49 CFR §173.27). Documentation that certifies the containers can withstand an internal pressure that produces a pressure differential of 95 kPa **SHALL** be provided to the shipper for the shipper to comply with regulations.
- Control radioactive samples in an RMA and control all samples with proper custody prior to shipment.
- Packages **SHALL** meet Drop and Stacking Test criteria for TYPE A packaging (49 CFR §173.403).
- Type A packages that meet DOT specifications for transport may be reused.
- For WIPP samples, shipping packages **SHALL** contain appropriate blank samples to detect any VOC cross contamination. Type A packages contain a minimum amount of compatible cushioning to the package to prevent shifting of and damage to sample containers during transport. Sufficient Blue Ice packs, or equivalent are added to the shipping container to maintain preservation temperature through laboratory receipt.

8.5.3 Preparing Sample Package Determined to be DOT LSA-II or TYPE A

ASD-Authorized Sample Shipper

- [1] Samples classified as DOT Hazardous Material that are shipped off-site by Traffic & Transportation require a properly completed Shipping Memo (RF F-1500.01) generated by the shipper. Instructions for completing the Shipping Memo are given in Appendix 1 of the OSTP ("Shipping Memo RFP F 1500.01 Instructions").
- [2] An ASD-authorized sample shipper **SHALL** perform an evaluation of documentation to determine if the shipment of a sample requires classification for a DOT Hazard Class to meet regulatory compliance with 49 CFR§171 through §178 and, if required by the air carrier, applicable IATA *DGRs*.
- [3] Samples **SHALL** be identified, labeled, packaged, and marked with DOT Hazard Classes, and described in accordance with the most current requirements of 49 CFR §171 through §180, and, if to be shipped by air, the IATA *DGRs*. The shipper **SHALL** follow the requirements of 49 CFR §171.11 when preparing and executing shipments under the provisions of the International Civil Aviation Organization Technical Instructions.
- [4] An evaluation **SHALL** be made to determine if there is a hazardous material Hazard Class association pertaining to the shipment as required by 49 CFR §172.101 Table and, if required by the air carrier, applicable IATA *DGRs*.
- [5] All previous labels **SHALL** be removed or covered.

8.5.3 Preparing Sample Package Determined to be DOT LSA-II or TYPE A (Continued)

- [6] Hazardous material packages **SHALL** be properly marked and labeled in accordance with 49 CFR §172.

NOTE: *A Site Preparation for Off-Site Shipment Checklist is prepared for each off-site shipment (see Appendix 2 of the OSTP, "Site Preparation for Off-Site Shipment Checklist"). The shipping package includes classification of each item and DOT Hazard Classes and EPA Waste Codes, if applicable. This information may be listed on the COC Form or a separate attachment*

- [7] No shipment of hazardous material packages **SHALL** be made without concurrence of the Traffic Manager or ASD subcontractor designees for the following:
- DOT-regulated shipping packages that exceed Quantity limitations (passenger aircraft/rail values in Column 9A of 49 CFR §172.101 Table)
 - IATA-regulated shipping packages that exceed the Maximum Quantity given in Section 4, Column J (passenger and cargo aircraft) of the IATA *DGRs* (current edition).
- [8] For samples containing reportable quantities of nuclear materials, NMA **SHALL** obtain authorization to ship and prepare DOE NRC Form 741 (refer to *MAN-010-MCA*). TIDs are required for off-site shipments of reportable materials.
- [9] Outbound packages **SHALL** bear a properly completed Shipping Label, or equivalent.
- [10] Evaluate the following documentation to determine the DOT Hazard Class or Division:
- [A] Radiological Surveys of packages meet the requirements of the SRCM and appropriate *RSPs*.
 - [B] SARF (as required, according to *PRO-543-ASD-002*) for waste stream information, EPA Codes, and any known DOT hazardous material in accordance with 49 CFR §172.101 Table.
 - [C] COC Form for information on whether preserved samples are classified as DOT hazardous material in accordance with 40 CFR §136.3 Table II and information is present on known DOT hazardous material in accordance with 49 CFR §172.101 Table.
- NOTE:** *An Authorized Radiological Engineer must prepare a Radiological Release Evaluation and complete the final signature approval prior to the off-site shipment of samples.*
- [D] A completed Release Evaluation (i.e., one with the final Radiological Engineer signature) for documented process history information and rad screen results, if required. DOT Calculations of Determination, if required, **SHALL** be prepared by a Site Authorized Radiological Engineer and attached to the Release Evaluation.
- [11] **IF** the documentation above is inadequate or additional information is required, **THEN** contact the sender/custodian for further information.
- [12] For Regulated Materials, complete the Off-Site Shipment Checklist given in Appendix 2 of the OSTP ("Site Preparation for Off-Site Shipment Checklist") to document the evaluation process and the determination of the Hazard Class.
- [13] Retain the Shipment Checklist and supporting documentation in the shipping documentation files.
- [14] Complete evaluation and documentation of any DOT Hazard Class according to Section 8.2 of this procedure.

8.5.3 Preparing Sample Package Determined to be DOT LSA-II or TYPE A (Continued)

- [15] **IF** the sample has been determined to be a Limited Quantity Hazard Class 7, LSA-II or TYPE A shipment,
THEN a typed Shipping Memo (RFPF-1500.01) **SHALL** be attached with the sample. The Shipping Memo will be used only for inventory control.
- [16] **IF** the sample has been determined to be Limited Quantity Class 7, LSA-II or TYPE A shipment,
THEN prepare a Radioactive Shipment Preparation Certification Form (RF-46404) (see Appendix 4 in the OSTP, "Radioactive Shipment Preparation Certification Form, RF-46404").
Type the Shipping Memo and the Air Label numbers on the Radioactive Shipment Preparation Certification Form.
Ensure that the Traffic shipping packet includes all the following information, if required:
- [A] Off-Site Shipment Checklist ("Site Preparation for Off-Site Shipment Checklist" given in Appendix 2 of the OSTP) that has been reviewed by Traffic & Transportation
 - [B] Radioactive Shipment Preparation Certification Form (white copy)
 - [C] Shipping Memo (white copy)
 - [D] Radiological calculations from Radiological Engineering
 - [E] Radiological Survey Forms from Radiological Operations
 - [F] Reports of rad screen results from on-site laboratories
 - [G] Copy of proposed Air Label
 - [H] The Air Label number is on both the Shipping Memo and the Radioactive Shipment Preparation Certification Form
- [17] Prepare a shipper's shipping packet and ensure that the packet includes all the following information, if required, including signatures, dates, and times, as:
- [A] Off-Site Shipment Checklist ("Site Preparation for Off-Site Shipment Checklist" given in Appendix 2 of the OSTP)
 - [B] Radioactive Shipment Preparation Certification Form (copy)
 - [C] Shipping Memo (copy)
 - [D] Radiological calculations from Radiological Engineering (copy)
 - [E] Radiological Survey Forms from Radiological Operations (copy)
 - [F] Reports of rad screen results from on-site laboratories (copy)
 - [G] The Air Label number is on the Radioactive Shipment Preparation Certification Form
 - [H] COC Form (copy)

8.5.3 Preparing Sample Package Determined to be DOT LSA-II or TYPE A (Continued)

- [18] Ensure that sample packaging is in accordance to 49 CFR §171 through §178 and, if required, by the air carrier, and meet the specific DOT 7A TYPE A packaging and instructions

Package the primary sample container as follows:

- [A] The bagged glass sample container is wrapped in bubble wrap.
- [B] Samples are placed in an internal large plastic bag to provide secondary containment.
- [C] Sample containers are placed into the approved outer package in an upright position except vials for volatile organic compound analytes. Vials for volatile organic compound analytes are placed in an inverted position.
- [F] **IF** 4 ± 2 °C (cool to 4 °C for WIPP) preservation is required, **THEN** follow the specific DOT 7A TYPE A packaging and instructions for sample preservation.

- [19] Ensure that sample package labeling is in accordance to 49 CFR §171 through §178 and, if required by the air carrier, applicable ICAO and applicable IATA DGRs.

Label the outer sample packaging as follows:

- [A] Place the Shipping Memo copy (packing slip), if required, and the COC Form (relinquished in accordance with PRO-543-ASD-002) in a sealed plastic bag.
- [B] Place a Caution Radioactive Material Label in a clear and unobstructed view on the outside of the bag with the Shipping Memo and COC Form.
- [C] Place a label on the plastic bag next to, but not touching, the Radioactive Material Label according to IATA DGRs (if required by the air carrier) when the shipment is by air and according to 49 CFR §171 through §178 when the shipment is by ground transportation.
- [D] Tape inside the outer package the sealed plastic bag that contains the labels, the Shipping Memo, COC Form, and any other required documentation. Close and secure the outer package.
- [E] Type the appropriate IATA DGRs (if required by the air carrier) or 49 CFR §171 through §178 statement on the Air Label or place a label in an area adjacent to the Air Label on the outer shipping package.
 - Ensure Transportation Index (TI) has been calculated and approved by Radiological Engineer and the ASD Shipping Manager when required by 49CFR §172.403
 - Ensure all other documents and labels have been properly marked or annotated with the Transportation Index numeric values when required by 49CFR §172.403.
- [F] **IF** a sample has been determined to be a hazardous material in a Hazard Class other than Class 7, **THEN** comply with 49 CFR §172 through §180 and applicable sections of the DGRs for the appropriate labeling regulations for the hazardous material identified.
- [G] Attach an appropriately completed Air Label to the outer shipping package.
- [H] Place the signed and dated custody seals in two locations, sealing the outer package lid so that subsequent tampering **SHALL** become evident.
- [I] Wrap strapping tape around the cooler or outer package lid in two locations to secure the lid.
- [J] Place a label that states contractor "for United States Department of Energy" and another label that states "Environmental Sample(s)."
- [K] Place the following labels on the outside of the shipping package in the appropriate locations in accordance with 49 CFR §171 through §178 and IATA DGRs (if required by the air carrier) marking and labeling requirements.

8.5.3 Preparing Sample Package Determined to be DOT LSA-II or TYPE A (Continued)

- [20] Ship packages from an approved Site location by an approved ASD designated contractor or carrier.

NOTE 1: *The package SHALL NOT be placed in the cab of a truck or any passenger areas of the transporting vehicle.*

NOTE 2: *Elastic cords SHALL NOT be used to secure coolers in vehicles.*

- [21] Place the package in the cargo area of a vehicle and firmly secure to prevent any type of movement during normal transportation.
- [22] Upon delivery of the sample package, relinquish the samples and custody by signing and dating the COC Form in accordance with PRO-543-ASD-002.

8.6 Class 7 Shipments Exceeding TYPE A Quantity

IF a shipment package will have a total activity exceeding TYPE A quantity stipulated in 49CFR §173.433, 434 and 435.

THEN notify Traffic Management who will assume responsibility for the shipment.

9. RECORDS

- (1) The Chain-of-Custody (COC) Form and the analytical data package are Quality Assurance (QA) records. The utilization of the COC Form is covered in *PRO-543-ASD-002*, Initiation, Preparation, and Implementation of Chain-of-Custody Forms.
- (2) Other records created as part of the activities related to on-site sample transfers and/or off-site sample shipments and covered by this procedure are not QA records as defined by *MAN-131-QAPM*, Quality Assurance Program Manual.
- (3) Records created as part of the activities related to on-site sample transfers and/or off-site sample shipments and covered by this procedure **SHALL** be maintained in accordance with the requirements of *1-V41-RM-001*, Records Management Manual, and records-retention schedules.
- (4) Pertinent documentation created as part of the activities related to on-site sample transfers and/or off-site sample shipments and covered by this procedure are processed according to the following table.

Record Identification Determination	Record Type	Protection/Storage	Processing Instructions
1. Sampling and Analysis Request Form (SARF) (if applicable)	Record	ASD Project Lead SHALL retain the SARF worksheet until the SARF data are entered into the Analytical Services Toolkit (AST). SARF information. The responsible Manager SHALL implement a reasonable level of protection to prevent loss and/or degradation of AST data.	SARF information is stored in the Analytical Services Toolkit (AST, the ASD-administered laboratory information management system). AST data are maintained in accordance with <i>1-V41-RM-001</i> and records-retention schedule.
2. COC Form (Refer to <i>PRO-543-ASD-002</i> , Initiation, Preparation, and Implementation of Chain-of-Custody Forms for further information concerning in-process and completed WIPP and non-WIPP COC Forms.)	QA Record	The COC Form SHALL be inserted into the Data Package or transferred to Program/Project Records in accordance with Program/Project requirements. Records SHALL be stored in standard office filing cabinets. The responsible Manager SHALL implement a reasonable level of protection to prevent loss and/or degradation.	The ASD-authorized records-management subcontractor maintains the data package, or, if applicable, transfers it to Program/Project Records in accordance with Program/Project requirements. When inactive (as defined in <i>1-V41-RM-001</i>), records are transferred to Site Records Management in accordance with <i>1-V41-RM-001</i> .
3. Data Package (Non-WIPP)	QA Record	The ASD-authorized records-management subcontractor SHALL maintain the data package, or, if applicable, SHALL transfer the data package to Program/Project Records in accordance with the Program/Project requirements. Records SHALL be stored in standard office filing cabinets. The responsible Manager SHALL implement a reasonable level of protection to prevent loss and/or degradation.	The ASD-authorized records-management subcontractor maintains the data package, or, if applicable, transfers it to Program/Project Records in accordance with Program/Project requirements. When inactive (as defined in <i>1-V41-RM-001</i>), records are transferred to Site Records Management in accordance with <i>1-V41-RM-001</i> .

9. RECORDS (Continued)

Record Identification Determination	Record Type	Protection/Storage	Processing Instructions
4. Shipping Documentation [Shipping Packet on file, which includes a copy of the COC Form, Release Evaluation, radiological surveys and/or reports of rad screen results (if applicable), classification/categorization characterization determination (for radiological and/or DOT-regulated material), RFP F-1500.01 Shipping Memo (for Radiological Class 7 shipments only), and RAM Tag/Label (if applicable)]	Record	The ASD-authorized sample shipper SHALL maintain the Shipping Packet until no longer needed. The responsible Manager SHALL implement a reasonable level of protection to prevent loss and/or degradation. Records SHALL be stored in standard office filing cabinets.	ASD-authorized sample shipper maintains Shipping Packet on file in accordance with <i>1-V41-RM-001</i> and records-retention schedule. When inactive (as defined in <i>1-V41-RM-001</i>), the Shipping Packet on file is destroyed as no longer needed.
5. Signed on-site transfer documentation that indicates the Sender/Custodian met the prerequisites in Section 5 prior to the transfer of sample-package custody to the Transporter	Worksheet (Non-Record)	The Transporter SHALL retain on-site transfer documentation as a worksheet until the on-site sample-package transfer is completed. When on-site sample-package transfer is performed by ASD-authorized sample shipper personnel, the worksheet is returned to ASD for purposes of sample-transport invoicing.	Worksheet is a non-record (no longer applicable after the transfer, receipt, and verification of sample-package contents are completed) and can be destroyed when no longer needed.
6. Nuclear Material and Drum Transfer Report (NMDTR)	Record	The Transporter SHALL retain on-site transfer documentation as a worksheet until the on-site sample-package transfer is completed. Disposition requirements are cited in <i>MAN-010-MCA</i> , Materials Control & Accountability Manual.	For on-site sample transfers requiring NMDTRs, both the Transporter and Receiver submit signed copies of the NMDTRs to Nuclear Materials Control (NMC) by the end of the shift in which the samples are transported.

10. REFERENCES

Codes of Federal Regulations

40 CFR §136.3 Table II

49 CFR §171 through §180

[Includes citations of §171.11, §172.101 Table, §173.27, §173.403, §173.421, §173.422, §173.423, §173.425, §173.435, and §173.443 (a) Table II]

International Air Transport Association *Dangerous Goods Regulations* (IATA DGRs)

MAN-001-SDRM, Site Document Requirements Manual

MAN-010-MCA, Materials Control & Accountability Manual

PRO-1329-DM-03, Site Document Control

MAN-131-QAPM, Quality Assurance Program Manual

MAN-T91-STSM-001, Site Transportation Safety Manual (STSM)

Site Radiological Safety Practices Manual

PRO-088-RSP-09.02, Radioactive Material Transfer and Shipment

PRO-141-RSP-09.01, Unrestricted Release of Property, Material, Equipment and Waste

PRO-164-RSP-07.01, Radiation, Contamination, and Airborne Radioactivity Survey Frequency

PRO-1004-RSP-09.08, Radioactive Material Transfer and Unrestricted Release of Property, Waste and Samples

MAN-102-SRCM, Site Radiological Control Manual (SRCM)

Article 412, Radioactive Material Labeling

Site Safety Analysis Report, Chapter 7

PRO-543-ASD-002, Initiation, Preparation, and Implementation of Chain-of-Custody Forms

NMSL 03-0023, *BIK-186*, Sample Transfer Packages: VPSDS001 & AP-1

PRO-T44-SWCSI-140, Management of Nuclear Criticality Safety Program Non-Compliances

PRO-T95-OSTP-002, Off-Site Transportation Procedure (OSTP)

1-A65-ADM-15.01, Control of Nonconforming Items

1-D97-ADM-16.01, Occurrence Reporting Process

1-V41-RM-001, Records Management Manual

4-P16-SA-TID-001, Tamper Indicating Devices (TIDs)

ST-AS19-FAC-003 Project Briefing Requirements for the Collection and Transport of Materials at Risk

ST-AS19-FAC-005, Building T-130A Operational Inventory Control

Ancillary References (not cited within the text of *PRO-908-ASD-004*):

Site Radiological Safety Practices Manual

3-PRO-165-RSP-07.02, Contamination Monitoring Requirements

PRO-267-RSP-09.05, Radiological Characterization for Surface Contaminated Objects

MAN-102-SRCM, Site Radiological Control Manual (SRCM)

Article 413, Radioactive Material Packaging

Article 423, Transportation of Radioactive Material

APPENDIX 1

SAMPLE LABEL EXAMPLE

NOTE: *The sample label illustrated below is an example.
Other types of sample labels that contain information required by Programs or
Projects (as specified in approved work-control documents) can be used.*

SAMPLE LABEL	
CONTRACTOR: (e.g., SSOC)	COC #: (e.g., 03Z0424#001)
BOTTLE NO.: (e.g., RIN 03Z0424-001.001)	LAB: (e.g., 559)
DATE: _____	TIME: _____
COLLECTOR: _____	
LOCATION: (e.g., B374 Process Waste)	
BOTTLE TYPE: (e.g., G 20 ML)	PRESERVATION: (e.g., None)
ANALYSIS LIC(s): (e.g., PA03A009 [Process 520 total alpha/pH])	

APPENDIX 2

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ACRONYMS, DEFINITIONS, AND UNITS

Acronyms:

ASD	Analytical Services Division (K-H ES&S)
CFR	Code of Federal Regulations
COC	Chain of Custody
CSOLs	Criticality Safety Operating Limits
DGR	Dangerous Goods Regulation (IATA)
DOE	Department of Energy
DOT	Department of Transportation
EPA	Environmental Protection Agency
IATA	International Air Transport Association
LIC	Line Item Code (unique identifier for a specific analysis)
NMDTR	Nuclear Material and Drum Transfer Report
NMSLs	Nuclear Material Safety Limits
OSTP	T95-OSTP-002, Off-Site Transportation Manual
PSAP	Personnel Security Assurance Program
RBA	Radiological Buffer Area
RFETS	Rocky Flats Environmental Technology Site (Site)
RIN	Report Identification Number (issued by ASD)
RMA	Radiological Management Area
RSP	Radiological Safety Practice contained in the <i>Site Radiological Safety Practices Manual</i>
SARF	Sampling and Analysis Request Form
SRCM	MAN-102-SRCM, Site Radiological Control Manual
STSM	MAN-T91-STSM-001, Site Transportation Safety Manual
TID	Tamper-Indicating Device
WIPP	Waste Isolation Pilot Plant

Definitions:

COC Form	Chain-of-Custody Form (an official Chain-of-Custody Form is maintained for any sampling event, providing a documented trail of all persons who had custody of the samples from their origin to final disposition)
Package	A packaging with its contents as presented for transportation (on-site or off-site) (49 CFR §171.8)
Packaging	A receptacle and other components or materials necessary for the receptacle to perform its containment function in conformance with the minimum packaging requirements of 49 CFR (49 CFR §171.8)
Rad Screen	Radiological Screening Analysis (analysis for total alpha activity and total beta activity)
RAM Tag/Label	On-Site Radioactive Material Tag/Label (for on-site use only, cites Contamination Survey results and Penetrating Radiation Survey results, as required)
Sender/Custodian	That person who offers a sample for on-site transfer or to an ASD-authorized sample shipper for off-site shipment
UN Number	United Nations Number (material identifier as given in 49 CFR §172.101 Table)

NOTE: Additional definitions are given in Appendix 1 of MAN-T91-STSM-001, *Site Transportation Safety Manual*.

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APPENDIX 2

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ACRONYMS, DEFINITIONS, AND UNITS

Units:

Bq/g	becquerels per gram
dpm/100 cm ²	disintegrations per minute per 100 centimeters surface (Loose Surface Contamination and/or Total Contamination Survey results)
kPa	kilopascal (a unit of pressure in the MKS system equal to 1000 newtons per cm ²)
μCi	microcurie (a unit of radioactivity equal to 3.7 x 10 ⁴ disintegrations per second, or 10 ⁻⁶ curie)
mrem	millirem [dosage of ionizing radiation equal to 0.001 rem (roentgen equivalent man)]
mSv	millisievert [dosage of ionizing radiation equal to 100 millirem (0.1 rem)]
nCi/g	nanocuries per gram

An Overview of Fingerprint Analysis:

Identifying DOT Hazard Classes begins at a Sender/Custodian level through process history and previous analytical results prior to the sampling event. Fingerprint analysis must be performed if the sample is an unknown material or contains known chemicals or hazardous materials listed in 49 CFR§172.101. Fingerprint analysis helps to identify DOT Hazard Classes and potential shipping risks by testing for compatibility, physical appearance, specific gravity, combustibility, presence of water, and miscibility and reactivity with water.