Low-Level Radioactive Waste Disposal
Andrews, Texas

Compact Waste Disposal Facility (CWF) Generator Handbook

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Acronyms and Abbreviations

AASHTO	American Association of State Highway and Transportation Officials
ALARA	As Low As Reasonably Achievable
ASTM	American Society for Testing and Materials
atm	Atmospheres
CFR	Code of Federal Regulations
cm	Centimeter
CRCPD	Conference of Radiation Control Program Directors
CWF	Compact Waste Disposal Facility
DOE	Department of Energy
DOT	U.S. Department of Transportation
DSHS	Texas Department of State Health Services
DU	Depleted Uranium
ELITE	Electronic Inventory Tracking Engine
EPA	Environmental Protection Agency
FWF	Federal Waste Disposal Facility
GTCC	Greater than Class C
HCD	High Container Dose
ICSS	Integrated Customer Service Specialist
ID	Identification
IHTS	Irradiated Hardware Transfer System
IP	Industrial Package
LC	Large Component
LDR	Land Disposal Restrictions
LLRW	Low-Level Radioactive Waste
LLMW	Low-Level Mixed Waste
µCi	Microcurie
MCC	Modular Concrete Canister
mrem/hr	Millirem per hour
MSDS	Material Safety Data Sheet
NA	Not Applicable
nCi/g	nanocurie per gram
NELAC	National Environmental Laboratory Accreditation Conference
NMMSS	DOE / NRC Nuclear Materials Management & Safeguards System
NRC	Nuclear Regulatory Commission
pCi/g	picocurie per gram
PPE	Personal Protective Equipment
QA/QC	Quality Assurance/Quality Control
Rem/hr	Rem per hour
RCRA	Resource Conservation and Recovery Act
R&D	Research and Development
RIS	Reporting Identification Symbol
RML	Radioactive Materials License
SNM	Special Nuclear Material
TAC	Texas Administration Code
TCEQ	Texas Commission on Environmental Quality
THSC	Texas Health and Safety Code
TLLRWDCC	Texas Low Level Radioactive Waste Disposal Compact Commission aka Texas Compact Commission (TCC)
ULLRWM	Uniform Low Level Radioactive Waste Manifest
WAP	Waste Acceptance Plan
WCS	Waste Control Specialists LLC

1.0 OVERVIEW

The purpose of this document is to assist the generator in doing business with WCS and provide guidance on specific criteria for waste acceptance at the CWF to ensure compliance with WCS licenses, permits, and procedures.

The CWF accepts commercial LLRW that is generated in a host state or party state or LLRW that is not generated in a host state or party state, but has been approved for importation to the state by the Texas Low Level Radioactive Waste Disposal Compact Commission (TLLRWDCC).

2.0 DEFINITIONS

2.1 Cask Waste

This waste category consists of any waste that must be shielded to meet shipping requirements, any waste shipped in Type A, Type IP-2 DOT cask or Type B Nuclear Regulatory Commission (NRC) cask regardless of dose rate, and any container with a dose rate greater than 1 Rem/hr at the surface of the unshielded container.

2.2 Compact Waste

LLRW that is not Federal Waste and is generated in Texas or Vermont, or is not generated in Texas or Vermont, but has been approved for importation by the TCC for disposal at WCS.

2.3 Containerized Waste

Waste that is received in a container and the container is placed in an MCC for disposal. Containerized waste can be bulk or non-bulk as long as the container fits inside the MCC. Dimensions of the standard sized MCCs are listed in Section 6.2.6.

2.4 Electronic Inventory Tracking Engine (ELITE)

A web-based database used by customers to submit profiles and shipment requests online. The same database is used by WCS to approve profiles and shipment requests as well as maintain inventory and disposal information. WCS requires that all profiles and shipment requests be submitted through this database.

2.5 Federal Waste

LLRW and LLMW that is the responsibility of the Federal government under the LLRW Policy Act as amended by the LLRW Policy Amendments Act of 1985 [i.e., Department of Energy waste, U.S. Navy vessel decommissioning waste, government atomic weapons research and development, testing, or production, excluding Greater than Class C waste (GTCC)]. Federal Waste is prohibited from disposal in the CWF.

2.6 Head Space

Head space is the empty volume of a waste container between the top of the waste and the top of the waste package. The term head space is used, as opposed to void space, when the waste type has minimal interstitial space within the waste in the container (e.g., resin, soil, sludge, compacted debris, etc.).

2.7 High Container Dose Rate Waste (HCD)

This waste category consists of all unshielded, containerized wastes, where 90% or more of the containers have a dose rate between 100 mrem/hr @ 30 cm and 1 Rem/hr at the surface of the container. Containerized wastes that would otherwise fall into the containerized soil or containerized debris categories, but will not be opened due to specific health and safety issues will be managed in the same manner as HCD wastes.

2.8 Large Component (LC)

Any equipment or large item that will not fit into a standard Modular Concrete Canister (MCC) and other waste for which disposal within an MCC may not be desirable.

2.9 Modular Concrete Canister (MCC)

Cylindrical or rectangular reinforced concrete canister that when properly filled with waste and grout meets the stability requirements found in 30 Texas Administrative Code (TAC) 336.362(b)(2) and conforms to the TCEQ regulatory requirements of retrievability.

2.10 Small Generator

A generator of low-level radioactive waste who generates no more than 100 cubic feet of such waste per year. Small quantity generator has the same meaning as small generator.

2.11 Source Material

Uranium or thorium, or any combination thereof, in any physical or chemical form; or ores that contain, by weight, 0.05% or more or uranium, thorium, or any combination thereof. Source material does not include special nuclear material.

2.12 Special Nuclear Material (SNM)

Plutonium, uranium-233 or uranium enriched in the isotopes uranium-233 or uranium 235, but does not include source material.

2.13 Unpackaged Bulk Waste (Non Containerized Waste)

Waste that is not placed in an MCC for disposal. WCS can only dispose of this type of waste in the CWF from in-Compact generators (e.g. Generators from Texas and Vermont).

2.14 Void Space

Void space is the empty volume of a waste container including the space between the top of the waste and the top of the waste package, and the interstitial space within the waste in the container. The term void space is used, as opposed to head space, when the waste type has more than minimal interstitial space between the waste pieces in the container (e.g., debris, irradiated hardware, filters, etc.).

3.0 OVERVIEW OF WASTE ACCEPTANCE PROCESS

See *Appendix 1 – Generator Steps to Disposal* for an additional graphic.

Step 1: Generator certification	**Step 2*:** Importation approval (If applicable)	**Step 3*:** Waste profile approval	**Step 4:** Waste shipment request	**Step 5:** Waste shipment approval	**Step 6:** Waste shipment verification

*Step 2 and 3 can be done in any order but must be complete before initiating Step 4

4.0 STEP 1: GENERATOR CERTIFICATION

All generators must be certified by WCS in accordance with our Quality Assurance (QA) Generator Certification Program prior to sending waste to WCS for disposal. All generators are required to submit a generator certification packet. WCS suggests that the generator or customer submit this information as early as possible to ensure approval well in advance of the desired shipping date. WCS will accept generator certification packets without a signed contract but will not give final approval of the generator certification until an executed contract is in place.

Each generator certification packet may be accompanied by multiple waste profiles, one for each waste stream the generator proposes to ship to WCS. Onsite audits will be conducted as required in Section 4.2. Approved generators will receive a generator certification identification number valid for 12 months. The generator certification identification number must be renewed through the generator certification process on an annual basis. The WCS QA department will contact the generator approximately 60 days in advance of the certification expiration to start the renewal process.

Only generators with an approved generator identification number will be authorized to ship waste to the CWF. The generator's certification identification number is required on all documentation and correspondence to WCS regarding waste disposal at the CWF. Any entity that provides information used for the classification and/or characterization of a waste, or handles the waste prior to shipment to the WCS facility will be included in the generator certification review process. For example, if a utility uses a subcontractor to perform dewatering and void filling operations for a resin waste stream, the processes and procedures for the subcontractor will be included in the review during the generator certification process to ensure those operations are sufficient to meet the requirements of the WCS license.

Another example would be for waste shipped to the WCS LLRW disposal facility from a waste broker. If the waste broker performs no activity other than consolidating waste containers for shipment (i.e., different wastes are not physically commingled), the original waste generators may be included in the waste generator certification process for the waste broker.

Generators who ship wastes to the CWF that do not meet regulatory requirements or otherwise result in the occurrence of a major discrepancy will be designated as non-compliant. WCS will suspend the generator identification number of any generator designated as non-compliant. Generators found to be non-compliant must apply for re-certification by resubmission of the generator certification packet. The resubmitted packet must be revised to reflect measures taken to prevent the reoccurrence of the violation that resulted in the non-compliance. Non-compliant

generators are also required to undergo the site audit process to qualify for re-certification, regardless of the waste receipt categories associated with the generator's wastes. See Section 9.1 for additional information on non-compliant waste and waste shipments.

4.1 Generator Certification Packet Submittal

Each generator shall submit a generator certification packet to WCS to obtain certification. The generator certification packet must contain documentation of all of the following programs as applicable:

- The waste classification/characterization program, including sampling and analytical procedures and frequencies, quality assurance/quality control procedures, procedures for documenting free liquids and void space, procedures for verification of Land Disposal Restriction (LDR) status (for LLMW), and procedures for verification that LLRW is not hazardous
- The program for determining the presence or absence of chelating agents, and, where chelating agents are present or potentially present, the methodologies for establishing a conservative upper bound for the typical concentration of chelating agents in each waste, and the basis upon which the methodologies provide a conservative upper bound of chelating agent concentrations
- The process control program identifying the procedures and systems in place to maintain consistency in the generating process and resultant wastes (required only when process knowledge is used in characterizing a waste)
- The waste packaging and shipping program
- The personnel training program applicable to persons responsible for all component steps in performing waste classification, characterization, packaging, and shipping
- A copy of the generator's radioactive material license, as applicable
  Records concerning their relevant compliance history. This includes results of regulatory inspections and compliance audits and resolution of any alleged non-compliant conditions or practices that would impact the generator's waste program
- Out of compact Generators shipping to the CWF will be requested to provide procedures or plans detailing the generator's volume reduction techniques for applicable wastes for meeting the requirements for WCS CWF Volume Reduction (VR).Details for the WCS CWF Volume Reduction requirements are outlined below per 30 TAC §336.739:
    - Volume reduction requirements are not applicable to the following waste streams:
        1. Irradiated hardware
        2. Solid forms, such as non-compactible metals or monoliths
        3. Large components
        4. Soils and demolition debris
        5. Sealed sources
    - For all other waste streams, waste must be reduced by a factor of three (i.e. the final volume of waste disposed is one-third (1/3) or less of the initial volume)
    - Examples of volume reduction methods include:
        1. Reduction of the volume of ion exchange media loaded into individual demineralizer vessels
        2. On-line lithiation strategies for reactor coolant purification demineralizers;
        3. Intermittent use of some demineralizers instead of continuous use (spent fuel pool)

4. Reduction by compaction of dry active waste or compactible waste
5. Removal of radioactive particulates from a liquid waste stream by the use of methods such as filters, ion-exchange medium (such as resin), precipitation, flocculation, or settlement (resultant liquid, if still radioactive, would not be considered volume reduced)
6. Incineration (any radioactive effluent captured in a device such as a baghouse or charcoal filter would not be considered volume reduced);
7. Concentration technologies such as evaporation, crystallization, drying, or dewatering; or
8. Repackaging or consolidation of waste in order to more efficiently minimize volume required for disposal in compliance with the license.

- Examples of what is not considered volume reduction include:
  1. Downblending
  2. Separation of radioactive waste from non-radioactive waste, such as debris or contaminated scrap metal
  3. Volume reduction based entirely on hypothetical calculations, rather than actual records of historical waste generation

4.2 Onsite Generator Audits

When waste profile information indicates that the waste meets the definition of cask waste, HCD rate waste, large components, and/or waste that is managed as HCD rate waste, WCS will perform an onsite audit except as provided in Section 4.3 or a variance is granted by Texas Commission on Environmental Quality (TCEQ). This audit will encompass verification and review of the generator's waste classification, characterization, chelating agent documentation, packaging, shipping, and other programs, practices, and records associated with waste generating activities.

If the waste profile information submitted with the generator certification packet indicates that all of the generator's waste streams meet WCS' criteria for intrusive inspection/sampling and does not require an onsite audit during the certification process, but the generator subsequently identifies one or more additional waste streams that do not meet WCS' criteria for intrusive inspection/sampling, the generator will be subject to an onsite audit during the waste profile review process for the additional waste.

WCS may also perform an onsite audit "for cause" based upon review of the generator certification packet. Any generator whose identification number is suspended due to non-compliance as described above must undergo an audit, regardless of the waste receipt categories associated with the generator's wastes, as part of the re-certification process.

WCS will develop an audit plan for each generator to be audited. The plan will include audit procedures and/or checklists that reflect specific elements of the programs submitted in the generator certification packet to determine compliance with applicable licenses, permits, plans and procedures. The following activities, at a minimum, will be conducted by an auditor as part of the generator site audit:

- Observe or verify onsite waste handling procedures, including transfer, storage, processing, packaging, and shipment preparation procedures
- Interview personnel with direct and supervisory responsibility for waste

classification/characterization and waste handling
- Observe or verify the actions taken to ensure that wastes shipped to the LLRW facilities meet each waste acceptance criterion (absence or quantity of free liquids, void space in containers, non-hazardous waste determinations for LLRW, LDR compliance for LLMW, etc.)
- Observe or verify the performance of measurements, analyses, calculations, or other methods used to classify and characterize radioactive waste
- Review records documenting use of chelating agents and the basis for the generator's waste profile information regarding chelating agents
- Review records documenting radioactive waste classification and characterization for waste shipments made during the previous year, regardless of the facility to which it was shipped, including, as applicable, process knowledge documentation

4.3 Nuclear Power Plant Inspections in Lieu of Onsite Audits

Due to the robust regulatory controls imposed upon nuclear power facilities by the NRC, the integrity of the inspecting body, and the thoroughness of the inspection program, nuclear power facilities will not have to go through the onsite audit process except "for cause." Nuclear power facilities will submit the latest NRC inspection report covering the area of Radioactive Material Processing and Transportation to WCS along with the generator certification packet as required in Section 4.1. In the event the NRC inspection report brings into question the facility's ability to compliantly deliver waste to WCS, a "for cause" site audit will be performed.

5.0 STEP 2: IMPORTATION APPROVAL (IF APPLICABLE)

Generators that have waste not originating in the Texas Compact (Texas and Vermont) that wish to send waste to the CWF for disposal will need to apply for importation through the TCC.

Generators are required to submit an application and term sheet to the TCC, WCS, and TCEQ to comply with 31 TAC §675.23, *Importation of Waste from a Non-Compact Generator for Disposal*.

Importation requests must be made by the actual generator of the waste. A small generator may use a broker to file import applications and proposed agreements with the TCC on its behalf. WCS will also assist generators through the importation approval process. Irradiated hardware shipments are subject to secondary approval and condition removal to ensure the CWF's annual curie allowance is not exceeded.

6.0 STEP 3: WASTE PROFILE AND WASTE CLASSIFICATION

A waste profile must be completed in ELITE for each authorized waste stream or appropriate combination of authorized waste streams that a generator intends to ship for disposal at the CWF. Any section not applicable on the form must be marked as "Not Applicable" or "NA." WCS will not accept blank input fields. Combining authorized waste streams will be evaluated on a case by case basis and approval will be determined based on similarities of the required waste acceptance verification requirements and the operational handling and disposal processes. In addition to completing the form in ELITE and attaching any supporting documentation, the generator is required to attach a signed copy of the printed profile from ELITE prior to hitting the "Submit" button.

The generator is encouraged to include information in the profile related to container processing and handling. Attachments may also be uploaded as needed to include any other relevant information about the waste, packaging, or shipment practice.

Generators, processors and/or brokers who treat or process waste intended for the CWF will be required to meet specific criteria listed in 30 TAC §336.745 for the commingling of compact waste with waste from other sources.

During the WCS Generator Certification process, WCS evaluates if the generator has the processes in place to comply with the volume reduction requirements for applicable waste streams. At the time of waste profiling for applicable waste streams, the generator will have to provide a certification that they are complying with the volume reduction processes that were evaluated at the time of generator certification. WCS will provide the generator with the certification form to include with the waste profile.

CWF generators must also document complete waste pedigree prior to shipment. Waste pedigree shall include the original waste type or form (i.e. resin, filters, dry active waste etc.), original waste class at the time of packaging for shipment, the original generator of the waste, and other waste processing or management to allow the waste to be tracked through the final packaging for shipment to disposal.

The completed waste profile and supporting documentation must allow WCS to demonstrate that the waste is compliant with regulatory requirements along with license and permit conditions applicable to the LLRW disposal facility. The completed profile form provides an overview of the waste stream and its physical, chemical, and radiological characteristics. The following radionuclides are required to be placed on a waste profile when present:

- Enriched U-235, enriched U-233, Pu-239, and Pu-241 [Special Nuclear Material (SNM)]
- Radionuclides that are required to be listed in accordance with the latest version of NUREG/BR-0204, *Instructions for Completing NRC's Uniform Low-Level Radioactive Waste Manifest*.
- Radionuclides that are required to be listed in accordance with 49 Code of Federal Regulations (CFR) Part 173.433(c)(2)
- Radionuclides that affect the dose rate of a package or shipment
- Uranium and/or thorium considered source material

In addition, a waste shipment cannot be accepted by WCS if the shipping documentation (manifest) lists radionuclides that are not present on the profile, or are manifested in concentrations that are higher than profiled. This includes LLDs, as well as any radionuclides that the shipper voluntarily identifies on the manifest in addition to those required. Limiting the number of nuclides that are manifested can simplify the profiling effort. Consequently generators should consult NUREG/BR-0204 for guidance on other radionuclides that should be identified on the waste profile.

Analytical data is typically required to be submitted with the waste profile. The data must be accompanied by an identification of the analytical method used for each parameter or constituent reported, and by QA/QC results. The generator must employ analytical methods approved by recognized entities (i.e., EPA, DOE, ASTM, or AASHTO) for waste analyses supplied with the

waste profile whenever possible. The generator may conduct analyses via other industry-accepted methods as necessary to classify and characterize the waste; however, the need to use these other methods must be documented by the generator. Refer to Section 6.7 for additional information on laboratory selection.

The generator may use process knowledge to augment analytical data in completing the waste profile, as long as there is reasonable assurance that this approach can be correlated by bounding or other relationships to actual measurements or known quantities. In certain cases, process knowledge alone may be sufficient to adequately characterize a waste (e.g., spill cleanup residues from a previously characterized waste; containers that have been emptied of their prior contents where the composition of the prior contents is known). Process knowledge may include use of scaling factors to develop inferred concentrations of radionuclides based on measured concentrations of other radionuclides or radionuclide material accountability. Documentation of the generator's process control program may be required if process knowledge will be used in characterizing a waste stream that is a routinely-generated waste resulting from a commercial or industrial process.

For other waste streams, including demolition wastes and other debris, the generator must thoroughly document the basis for classification and characterization of the waste stream and include any pertinent analytical data or known composition information for chemical and radioactive materials with which the waste materials may have been in contact. See Section 6.3 for waste-stream-specific characterization requirements.

The generator's waste profile and supporting documentation, in conjunction with the information in the generator's certification packet, must demonstrate reasonable assurance that the waste is correctly classified as Class A, Class B, or Class C in accordance with the waste classification tables in 30 TAC §336.362, Appendix E, as summarized in the Waste Classification Table 1 and 2 below; that any and all hazardous characteristics and constituents have been identified; and that the concentration of any chelating agents have been conservatively established. The combined documentation must include the methodology used to classify/characterize the waste and the basis upon which the classification and characterization was established and demonstrate that the basis for classification/characterization is adequate and appropriate.

Generators are required to re-certify the waste profile information on an annual basis or when the process generating a waste or the characteristics of a waste changes from the information presented in the current waste profile. A new waste profile must be submitted to WCS for review and approval prior to scheduling additional shipments of the waste. A minimum fee for each initial profile approval may apply (particularly for small-volume profiles, or for the approval of profiles under which no shipments are made). This fee may be waived by WCS or may be credited towards the first shipment of the waste stream at the time of shipment.

Table 1 – 30 TAC §336.362 Appendix E, Table I, Class A and C Waste - Long Lived Isotopes

Radionuclide	Class A Limit		Class B Limit		Class C Limit	
C-14	0.8	Ci/m³	[1]	Ci/m³	8	Ci/m³
C-14 in Activated Metals	8	Ci/m³	[1]	Ci/m³	80	Ci/m³
Ni-59 in Activated Metals	22	Ci/m³	[1]	Ci/m³	220	Ci/m³
Nb-94 in Activated Metals	0.02	Ci/m³	[1]	Ci/m³	0.2	Ci/m³
Tc-99	0.3	Ci/m³	[1]	Ci/m³	3	Ci/m³
I-129	0.008	Ci/m³	[1]	Ci/m³	0.08	Ci/m³
Alpha-emitting transuranic radionuclides with half-lives greater than five (5) years	10	nCi/g	[1]	nCi/g	100	nCi/g
Pu-241	350	nCi/g	[1]	nCi/g	3,500	nCi/g
Cm-242	2,000	nCi/g	[1]	nCi/g	20,000	nCi/g
Ra-226[2]	10	nCi/g	[1]	nCi/g	100	nCi/g

[1] There are no limits established for these radionuclides in Class B wastes

[2] This isotope is not listed in the classification tables in 10 CFR Part 61 but is required by the state of Texas to be included in classification determination

Table 2 – 30 TAC §336.362 Appendix E, Table II, Class A, B and C Waste - Short Lived Isotopes

Radionuclide	Class A Limit		Class B Limit		Class C Limit	
Total radionuclides with half-lives less than five (5) years	700	Ci/m³	[3]	Ci/m³	[3]	Ci/m³
H-3	40	Ci/m³	[3]	Ci/m³	[3]	Ci/m³
Co-60	700	Ci/m³	[3]	Ci/m³	[3]	Ci/m³
Ni-63	3.5	Ci/m³	70	Ci/m³	700	Ci/m³
Ni-63 in Activated Metals	35	Ci/m³	700	Ci/m³	7,000	Ci/m³
Sr-90	0.04	Ci/m³	150	Ci/m³	7,000	Ci/m³
Cs-137	1	Ci/m³	44	Ci/m³	4,600	Ci/m³

[3] There are no limits established for these radionuclides in Class B or C wastes. Practical considerations such as effects of external radiation and internal heat generation on transportation, handling, and disposal will limit the concentrations for these wastes. These wastes shall be Class B unless the concentrations of other radionuclides in Table 2 determine the waste is Class C independent of these radionuclides.

6.1 ELITE Software Registration

WCS has developed a web-based database, named ELITE that is used by customers to submit profiles and shipment requests online. The same program is used by WCS to approve profiles and shipment requests as well as maintain inventory and disposal information. WCS requires that all profiles and shipment requests be submitted through this website. Users will have the ability to create profiles and shipment requests as well as attach all necessary supporting documentation. Generators using LowTrack™, eMWaste™ (Attention IT), RADMAN™ (WMG Inc.), or ISIP (DW James Consulting) can upload electronic NRC Forms 540, 541 or 542 into ELITE at the time of shipment request. Generators using NAC Reporter™ (NAC International) or other software to generate an unclassified NMMSS-readable NRC Form 741 data file may transmit the data to WCS electronically in addition to the hardcopy accompanying the manifest. WCS suggests that each generator register for an ELITE account early in the generator certification process to expedite the process. A physical signature from an authorized agent of the generator will still be required on all forms and manifests. Please contact WCS for more details and assistance.

6.2 Limitations

Some of the limitations below are also captured in *Appendix 2 - Waste Stream Restrictions*

6.2.1 License Volume and Curie Limitations

- Commercial LLRW volumes disposed in the CWF shall not exceed 9,000,000 cubic feet or total decay corrected radioactivity not to exceed 3,890,000 Curies.

6.2.2 Chelating agents

- Limited to 8% by weight for each waste stream (e.g., profile)
- During the Generator Certification process, WCS will review the generator's program for determining the presence or absence of chelating agents, and, where chelating agents are present or potentially present, the methodologies for establishing a conservative upper bound for the typical concentration of chelating agents in each waste, and the basis upon which the methodologies provide a conservative upper bound of chelating agent concentrations (see section 4.1 and 4.2)
- For profiles of waste streams that contain chelating agents, the generator will have to provide documentation, calculations and/or an explanation of the process for ensuring compliance with this limit for the waste stream associated with each waste profile. (see section 6.0)

6.2.3 Free liquids

- Must not exceed 1% of the volume in containerized waste
- No visible free liquids are allowed in non-containerized or Bulk waste
- Absorbents used to absorb free liquids must be non-biodegradable and capable of absorbing the liquids
- Liquids must be solidified in sufficient absorbent material to absorb twice the volume of liquid

6.2.4 Void Space/Head Space

This requirement is for containerized waste only

- Must be reduced to the extent practicable
- LLRW can have no more than 15% void space/headspace; this limitation does not apply to shipments in the TN-RAM cask.

NOTE: WCS may request an exemption from TCEQ for > 15% void space/headspace when meeting this requirement is not practical for ALARA or other compelling reasons

6.2.5 Void Filling/Solidification Agents

Void filling/solidification agents are required to be non-biodegradable. Two examples are vermiculite and concrete. There is not an approved list of void filling/solidification agents.

NOTE: WCS has the ability to dewater/void fill containers to meet the free liquids and/or void space/head space criteria for containers shipped directly to the CWF prior to disposal. Contact your WCS Business Development representative to ensure the proper contracts are in place for this service.

6.2.6 Waste Packaging

- Each package or container shall only contain one approved profiled waste stream. See Section 5.0 for combining approved waste streams in a single profile
- Packages weighing over 10,000 lbs sent to the CWF may be subject to an additional surcharge
- Drums exceeding 1,000 lbs must be palletized and banded unless alternate arrangements are made with WCS
- All containers transported on public roads to WCS are required to meet the applicable requirements of the Texas Department of State Health Services (DSHS) and DOT regulations (49 CFR)
- Cardboard, fiberboard, and wood boxes are prohibited
- WCS currently has two standard types of MCCs:
  - Cylindrical: 6' 8" D x 9' 2" H (internal dimension)
  - Rectangular: 9' 6" L x 7' 8" W x 9' 2" H (internal dimension)
  - WCS has the ability to use alternate sizes to fit your waste needs. This alternative will be evaluated on a case by case basis.

6.2.7 Waste Class

The CWF is authorized to receive containerized Class A, Class B, and Class C LLRW and Large Components evaluated on a case by case basis.

The CWF is also authorized to receive non-containerized or Bulk Class A waste with a dose rate of <100 mrem/hr at 30 centimeters from in-Compact generators only (Texas and Vermont).

6.2.8 Dilution

In accordance with 30 TAC §336.229, generators shall not reduce the concentration of radioactive constituents by dilution or change the waste classification for the purpose of disposal. Radioactive material that has been diluted as a result of stabilization, mixing, or treatment, including, but not limited to, Resource Conservation and Recovery Act (RCRA) LDR treatment, or for any other reason, shall be subject to the disposal regulations it would have been subject to prior to dilution. Encapsulation and classification of sealed sources and discrete items is acceptable when performed in accordance with the United States Nuclear Regulatory Commission's (U.S. NRC's) current "Concentration Averaging and Encapsulation Branch Technical Position" (BTP).

6.2.9 Waste Form

- Containerized debris must contain *greater* than 50% debris
- Containerized soil or soil-like waste must contain *less* than 50% debris

6.2.10 Waste Stability Requirements

- The MCC disposal structure provided by WCS will provide the stability required for radioactive waste in accordance with 10 CFR 10 CFR §61; therefore, the waste or the waste form as shipped to WCS is not required to meet stability requirements.
- All Class A waste with a does rate > 100 mrem/hr at 30 centimeters, Class B waste and Class C waste shall be containerized and placed in an MCC.

6.2.11 Transportation

Transportation by highway and rail are acceptable means for delivery of waste to the CWF.

6.2.12 Prohibited Wastes Types

- Waste of international origin [THSC §401.207(0)]
- Greater than Class C (GTCC) waste
- Naturally-occurring radioactive material (NORM) waste including oil & gas NORM
- Byproduct material waste [11.e(2)]
- High-level radioactive waste
- Uranium hexafluoride
- Waste capable of generating toxic gases, vapors, or fumes (excluding radioactive gases)
- Waste readily capable of detonation or of explosive decomposition or reaction at normal pressures and temperatures or of explosive reaction with water
- Transuranic waste in concentrations greater than 100 nCi/g
- Municipal solid waste
- Liquid waste
- Explosive or pyrophoric material
- Putrescible waste
- Low Level Mixed Waste
- Hazardous waste
- Waste that is commingled with Federal Facility Waste during processing
- Oil or petroleum products

NOTE: Treated LLMW where RCRA codes no longer apply (characteristic waste) and Underlying Hazardous Constituents (UHCs) meet Land Disposal Restriction (LDR) limits is acceptable as long as it can be profiled as LLRW.

6.3 Additional Criteria for Specific Waste Streams

6.3.1 Sealed Sources & Special Form Radioactive Material

- Must be doubly-packaged and encased in concrete or similar material within the outer package. This requirement does not apply to check sources (<100 µCi).
- For waste classification, the activity can be averaged over the entire package in accordance with the United States Nuclear Regulatory Commission's (U.S. NRC's) current "Concentration Averaging and Encapsulation Branch Technical Position" (BTP).
- The activity concentration of the entire package cannot exceed the limits specified in 30 TAC §336.362(a)(2) for Class C low-level radioactive waste
- See Sections 7.1.3 and 7.1.4 for notification requirements for neutron sources and nationally tracked sources as defined in 10 CFR §20.1003

6.3.2 Discrete Items

- For waste classification, the activity can be averaged over the entire package in accordance with the United States Nuclear Regulatory Commission's (U.S. NRC's) current "Concentration Averaging and Encapsulation Branch Technical Position" (BTP)

6.3.3 Wastes Containing SNM and/or Source material

- WCS uses waste profiles and incoming manifests to track inventory of SNM and source material in accordance with our radioactive material licenses. In order to do this compliantly, generators must profile waste streams that contain SNM and/or source material isotopes as either an SNM waste stream or a source material waste stream in Section 13 of the waste profile form. If a profile contains both SNM and source material, WCS considers the waste stream to be an SNM waste stream.
- Waste profiles can contain a broad range of isotopes that may not be applicable to every container under that profile (i.e. sealed sources profile). If a profile has both SNM and source isotopes, and therefore is designated as a SNM waste stream, it is not acceptable to send a container that has source material isotopes only and no SNM, under that SNM profile (e.g. you will need a separate profile that does not contain the SNM isotopes and is designated as a source material waste stream)
- For manifesting, if a waste stream is an SNM waste stream, then the manifest should reflect the grams of each isotope on the NRC Form 541. It is not necessary to manifest the kilograms of source material isotopes for a container that is shipped under an SNM profile and therefore considered an SNM waste stream.

6.3.4 Biological, Pathogenic or Infectious Waste

- Must be treated to reduce to the maximum extent practicable the potential hazard from the non-radiological materials
- Incineration is the preferred method of treatment for biological, pathogenic or infectious waste
    - Incinerator ash must be solidified or treated in such a manner as to be rendered non-dispersible in air, exclusive of packaging
- Biological waste that is not incinerated must be doubly packaged. Refer *to Appendix 3 - Hazardous, Biological, Pathogenic, Or Infectious Waste Packaging*:
    - Outer container
        - Must have a volume of at least 1.5 times the inner container
        - Initially filled with at least 4 inches of absorbent material
        - After the inner container is placed in the outer container, the remaining volume in the outer container must be filled with absorbent material, then securely closed and properly sealed
    - Inner container
        - Capacity of 55-gallons or less
        - Must have a water tight liner at least 4 mils thick and be hermetically sealed after filling
        - The biological material must be thoroughly layered in the inner container in a ratio of 30 parts biological material to at least 1 part slaked lime and 10 parts absorbent, which shall be agricultural grade 4 vermiculite or medium grade diatomaceous earth or other absorbents that have received approval by the executive director by volume.
        - The addition of formaldehyde is prohibited

- The closure on the inner container shall be standard lid with securely attached ring and bolt. Lever locks are prohibited.
- Must be placed in an upright position in the outer container

6.3.5 Radioactive Gases

- Must be packaged at an absolute pressure that does not exceed 1.5 atmospheres (atm) at 20°C
- Total radioactivity may not exceed 100 Ci per container

6.3.6 Large Components

- Will be evaluated on a case-by-case basis
- Must be backfilled with grout, if necessary, to ensure voids are filled
- For each LC, WCS will develop and submit an LC-specific disposal plan with the assistance of the generators to TCEQ 90 days in advance of the shipment authorization. An LC specific disposal plan will include a comprehensive and integrated plan that shall include, but may not be limited to the following:
  - Transportation Plan
  - Lifting Plan
  - Disposal Placement Plan
  - ALARA Plan
  - Waste Profile

6.4 Use of Shielded Shipping Casks

Identify the cask model and cask loading configuration information in the waste profile, specifically if the liner will be in a lift bag, retrievable with a grapple or retrievable with slings. For liners with slings, specify if the slings are wire or synthetic. Discuss other cask shipment configurations with WCS during the waste profiling process.

6.4.1 Liners in Lift Bags

WCS requests that generators attach a ¼" by 20' recovery line on the original liner lifting cables. Put a brightly colored piece of duct tape on the lifting ends of the bag lifting straps. This enables WCS staff to have an obvious target when fishing for the lifting ends while looking through a mirror.

Straps and slings must be readily accessible beneath the cask primary lid by staff using extended reach tools while located at the side of cask, below the plane of the cask opening. Do not allow lifting straps or slings to slide down between the liner and cask or become tangled.

6.4.2 Liners lifted with grapple

WCS can offload 6-80 and 8-120 poly or carbon steel liners equipped with an installed grapple bale. WCS' grapple can retrieve 6-80 liners from the bottom of casks; cribbing under the liners is not required.

6.4.3 Liners with Slings

WCS can offload any liner that is loaded into a cask with appropriately rated wire or synthetic slings. The generator must specify if wire or synthetic slings are used as this affects WCS' offloading rigging configuration.

Rigging and slings must be readily accessible beneath the cask primary lid by staff using extended reach tools while located at the side of cask, below the plane of the cask opening. Do not allow rigging or slings to slide down between the liner and cask or become tangled.

Standard Configuration - Typically liners have a total of (4) four connection points on top for attaching rigging/slings. The preferred configuration of rigging/slings for WCS is to have (2) two separate slings (synthetic or wire) with each end of each sling attached to one of the four liner connection points with a shackle of equal or greater lifting capacity as the sling. The two slings then form a "handle" for the liner similar to a grocery bag. In some instances, the generator may desire to use other configurations of slings / rigging for various reasons, in these instances please contact WCS to discuss the alternative sling / rigging configuration.

6.4.4 Irradiated Hardware Cask and Liners

Irradiated hardware shipments that arrive in TN-RAM or 3-60B liners will be offloaded exclusively with WCS' Irradiated Hardware Transfer System (IHTS) and a grapple. In special arrangement situations discussed and approved with WCS prior to receipt of the cask/liner, WCS may manually hook up an alternative rigging method to the IHTS that does not involve the grapple. In order to fit in the MCC for disposal at the CWF, the irradiated hardware liner must not exceed an overall height of 107 inches and 34 inches in diameter.

6.4.5 Other Configurations in Shielded Shipping Casks

Please contact WCS during waste profiling to discuss other cask shipment configurations.

6.4.6 Type B Cask Authorized User Information

WCS is an authorized user of the 8-120B (certificate of compliance 9168), 10-160B (certificate of compliance 9204), RT-100 (certificate of compliance 9365), TN-RAM (certificate of compliance 9233) and 3-60B (certificate of compliance 9321) casks. WCS will become an authorized user of other Type B casks upon request. Type A casks do not require prior user authorization by NRC.

6.5 Authorized Waste Streams

The CWF is authorized to receive containerized Class A, Class B, and Class C LLRW that fit into standard MCCs, and can also accept Large Components subject to case-by-case evaluation. For TX and VT generators only, the CWF is authorized for the disposal of Class A bulk waste with a dose rate of < 100 mrem/hr @ 30 centimeters.

6.6 Pre-Shipment Samples (Soil & Soil-Like Waste)

Pre-shipment samples are required during the profile approval process for soil and soil-like waste streams that are < 100 mrem/hr @ 30 cm. WCS will contact the generator when a pre-shipment sample is required and what the requirements are for providing the pre-shipment sample to WCS. See *Appendix 6- Pre-shipment Sample Analysis Requirements*

NOTE: Do not send pre-shipment samples unless specifically requested by WCS.

6.7 NELAC Accreditation

Analytical data from samples measured by a laboratory can only be accepted if the laboratory is National Environmental Laboratory Accreditation Conference (NELAC) accredited by the Texas Laboratory Accreditation Program operated by the TCEQ or the data are exempt from the NELAC-accreditation requirement under one of the following criteria [30 TAC §25.6]:

- The laboratory is an on-site or in-house environmental testing laboratory that
  - is inspected at least every three years by the executive director,
  - is located in another state and accredited or periodically inspected by that state, or
  - gets inspected at least every three years by the executive director and is performing work:
    - for another company with a unit located on the same site, or
    - without compensation for a governmental agency or a charitable organization.
- The lab is accredited under federal law, including certification by the United States Environmental Protection Agency to provide analytical data for decisions relating to compliance with the Safe Drinking Water Act.
- The lab supplies analytical data necessary for emergency response and the required analytical data are not otherwise available from an environmental testing laboratory that is accredited by the TCEQ or federal law.
- The lab supplies analytical data for which the commission does not offer accreditation (i.e., in-situ gamma spectroscopy).

A list of laboratories accredited by the TCEQ and the accredited analytical methods is available at www.tceq.state.tx.us/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf.

6.8 DSHS Shipper and Transporter Registration

All entities appearing as either Shippers (generators or brokers) or as Carriers (transporters) on NRC Form 540 must be registered with DSHS prior to disposal in Texas. Shippers and transporters must submit documents described in DSHS Regulatory Guide 2.19, *Guide for Submission of Documents and Fees by Low Level Radioactive Waste Shippers and Transporters*, to DSHS at least fourteen (14) days prior to the first shipment departure.

WCS maintains a current list of DSHS-approved shippers and transporters for disposal of LLRW in Texas. Registration for shippers is valid for up to ten (10) years, and registration for transporters must be renewed annually at the time of insurance renewal. WCS will not approve shipment requests from entities without current DSHS registration. Registration assistance is available from WCS' Customer Service Department and from DSHS.

7.0 STEP 4: WASTE SHIPMENT REQUEST

Each shipment of waste to WCS must be pre-approved. Once a generator has an executed contract with WCS, completed generator certification, has an approved profile from WCS, and is approved for importation of waste, if applicable, then the generator can request to make a shipment to WCS using ELITE.

The generator must fill out a Waste Shipment Request form in ELITE and submit the completed form along with an advanced copy of the shipping documents that will accompany the shipment ***at least five (5) business days prior to shipment departure.*** A list of required documentation, as applicable, is listed below:

- NRC Form 540/541/542 *Uniform Low Level Radioactive Waste Manifest* (ULLRWM)
- NRC Form 741 Nuclear Transaction Form, as applicable
- Asbestos Record of Shipment, as applicable

7.1 Pre-Shipment Notifications

7.1.1 Advanced Shipment Notification to TCEQ

In addition to the notification to WCS, every waste shipment that is eligible for acceptance and transfer of title to the State of Texas will require additional documentation to be completed by the waste generator and submitted to TCEQ ***five (5) business days prior to shipment departure*** for verification and tracking purposes. Each generator or processor will use TCEQ Form 20225, *Texas Compact Waste Shipment Verification*, which can be found on TCEQ's external web page by clicking on the "Forms" link located on the left portion of the page or at http://www.tceq.texas.gov/assets/public/permitting/rad/Waste_Generator_Disposal_Guide/WSV_Form_20225_and_Instructions.docx. The form must be completed and submitted via electronic mail to RADMAT@TCEQ.texas.gov or by facsimile at (512) 239-6464. A waste manifest must be included with the advanced notification.

7.1.2 Advanced Shipment Notification to DSHS

Five (5) business days prior to shipment departure, each shipper shall notify DSHS providing a copy of the waste manifest and the date of shipment. WCS performs the DSHS notification on behalf of the shipper, unless the shipper requests otherwise. The notification may be submitted by facsimile to (512) 834-6690, email to Tami.Maxwell@dshs.state.tx.us, Jennifer.Ludwig@dshs.state.tx.us, and Albert.Hille@dshs.state.tx.us or to:

US Mail: Texas Department of State Health Services
Radioactive Material Licensing – MC 2835
P.O. Box 149347
Austin, TX 78714-9347

UPS/FedEx: Texas Department of State Health Services (512) 834-6688
Radioactive Material Licensing – MC 2835

8407 Wall St
Austin, TX 78714

7.1.3 Neutron Sealed Sources

The generator must notify WCS and TCEQ of the intent to ship a neutron sealed source. The notification must consist of written notification to WCS ***prior to the five day advanced notification***. WCS will forward the notification to the TCEQ onsite inspectors. The notification needs to include the following information:

- Isotope
- Activity
- Form of the source
- Description of the packaging utilized
- Radiological data
- Requested date of arrival

NOTE: A copy of the Neutron Sealed Sources notification must accompany the shipment.

7.1.4 Nationally Tracked Sources As Defined In 10 CFR §20.1003

Prior to shipping, the generator must provide WCS and TCEQ the following information:

- Generator's name, shipping address, radioactive material license number, and name of individual preparing the reported information
- The manufacturer, model, and serial number of the source, or if not available, other information to uniquely identify the source
- The radioactive material in the source and the current activity in Becquerels (Bq) and Curies (Ci). The activity reported must be the same as the activity that will be listed on the shipment manifest
- The date the source strength is reported
- The requested shipping date and estimated arrival date
- The waste manifest number and the waste disposal container number

The generator should provide this information in writing to WCS. WCS will forward the information to the TCEQ onsite inspectors

7.1.5 Lead Used For Radiation Shielding Purposes

Only lead used for radiation shielding purposes is acceptable for disposal in the CWF. Requests for disposal of non-contaminated lead used for shielding purposes must be evaluated by WCS ***prior to request for shipment***. Generators must provide the following information for shipments containing lead:

- Type of lead used (sheet, block, pig, etc.)
- Amount of lead used (in pounds) and a graphic depiction of its location and configuration within the package that will support WCS' dose modeling
- Container type and size
- Description of the waste requiring shielding including waste classification
- Approximate external dose rate prior to shielding
- External dose rate after shielding
- As the CWF is not a hazardous waste landfill, WCS will also require the generator/shipper to evaluate alternative types of shielding to show that lead is necessary for disposal at the CWF.

7.1.6 Commingling Certification

Per 30 TAC §336.745, if waste is commercially processed, both the processor/broker and WCS are required to certify that compact waste was not commingled with waste from other sources in exceedance with the limits listed in that regulation. Commercial processing is the storage,

extraction of materials, transfer, volume reduction, compaction, incineration, solidification, or other separation and preparation of radioactive substances from other persons for reuse or disposal, including any treatment, or activity that renders the waste less hazardous, safer for transport, or amenable to recovery, storage, or disposal. Commercial processing does not include processing by a third party at a generator's site. WCS will draft and sign the commingling certification, send it to the processor/broker for signature, and submit the signed document to TCEQ.

7.2 Shielded Shipping Cask Configuration

Include cask model and cask loading configuration information in the shipment request, specifically if the liner will be in a lift bag, retrievable with a grapple or retrievable with slings. For liners with slings, specify if the slings are wire or synthetic.

NOTE: Refer to Section 6.4 for additional shielded shipping cask configuration information.

7.3 Shipping Document Information

See *Appendix 4 – NRC Form Examples* for illustration of the WCS-specific entries to NRC Forms 540, 541, 542 and 741 described below.

7.3.1 NRC Form 540 Block 5, Shipper I.D. Number

Enter the certified generator's nine (9) character generator certification number assigned by WCS in Block 5 of NRC Form 540.

7.3.2 NRC Form 540 Block 5, Shipment Number

WCS does not require anything in this block. If the shipper chose to do so, they could enter either data determined by the shipper or the ELITE shipment number in Block 5 of NRC Form 540.

7.3.3 NRC Form 540 Block 5

WCS does not require anything in this block. If the shipper chose to do so, they could enter either data determined by the shipper or the five (5) character DSHS Shipper Registration number assigned by DSHS in Block 5 of NRC Form 540, under the shipper's address and to the left of the shipment number.

7.3.4 NRC Form 540 Block 9, Consignee

Enter WCS as the consignee exactly as shown below in Block 9 of NRC Form 540.

Waste Control Specialists LLC
Compact Waste Disposal Facility
9998 W. State Hwy. 176
Andrews, TX 79714

Contact – Susan Van Leuven
Phone – (432) 525-8500

7.3.5 NRC Form 540 Block 11, U.S. Department of Transportation Description

Enter your waste profile number in parentheses after your proper shipping name or add it to the Additional Notes page accompanying NRC Forms 540/541/542.

7.3.6 NRC Form 541 Block 4, Shipment ID Number

Enter the certified generator's nine (9) character generator certification number assigned by WCS in Block 4 of NRC Form 541.

7.3.7 NRC Form 541 Block 15, Concentration

WCS requests that generators list the concentration of each isotope in picocuries per gram (pCi/g) in Block 15 of NRC Form 541. If this is not possible, upload an Excel® spreadsheet with pCi/g information for each row of isotopic data on NRC Form 541 as an attachment to the ELITE shipment request.

7.3.8 NRC Form 741 Block 2, Reporting Identification Symbol (RIS)

WCS' unclassified Reporting Identification Symbol (RIS) for the CWF is VAD. Generators using NAC Reporter™ (NAC International) or other software to generate an unclassified NMMSS-readable NRC Form 741 data file may transmit the data to WCS electronically in addition to the hardcopy accompanying the manifest.

7.3.9 NRC Form 741 Block 9, Receiver Data

It is optional to enter WCS' address and radioactive materials license number.

7.3.10 NRC Form 741 Block 23a, Manifest Number

WCS requires customers to list the ULLRWM number in the miscellaneous box on the DOE/NRC Form 741/741A.

7.3.11 NRC Form 741 Block 24, Total Gross Weight

Enter the gross weight of the disposed waste rounded to the nearest whole kilogram from Form 541. Do not include the weight of reusable shipping containers that will not be buried (i.e., Type A and B shielded casks).

7.3.12 NRC Form 741 Block 25, Total Volume

Enter the volume of the disposed waste rounded to the nearest whole cubic foot from Form 541. Do not include the external volume of reusable shipping containers that will not be buried (i.e., Type A and B shielded casks).

7.3.13 DSHS Shipper and Transporter Registration Number(s)

DSHS shipper and transporter registration number(s) is <u>not required</u> on the shipping documents. If included, it is suggested to enter it in Block 5 of Form 540, under the shipper's address and to the left of the shipment number.

8.0 <u>STEP 5:</u> WASTE SHIPMENT APPROVAL

WCS will review the Waste Shipment Request form in ELITE and the associated shipping documentation. WCS will work with the generators to promptly process and approve or resolve any discrepancies or address any concerns associated the with the shipment request.

Once WCS is satisfied with the shipping documentation and has approved the delivery of the shipment, WCS will provide the generator with a Waste Shipment Approval form via email. This form will contain the scheduled date and time for delivery of the shipment. This form is WCS's indication to the generator that they are authorized to ship the waste for disposal at the CWF.

If applicable, irradiated hardware shipments may proceed based on WCS approval pending receipt of a TCC condition removal letter for importation, but cannot be accepted for disposal by WCS until the condition removal letter is received.

NOTE: WCS will not approve a shipment request unless both the Shipper and Carrier on NRC Form 540 hold current DSHS registration.

8.1 WCS-Specific Waste Package Marking

Each package, except for Cask Waste, must be marked with the information specified below:

- Generator name (as listed on the associated profile)
- Waste profile number associated with the container (one waste profile per container)
- Manifest number
- Generator's unique package ID number
- Gross weight of container in pounds

NOTE: Based on As Low As Reasonable Achievable (ALARA) principles, generators may make arrangements with WCS to convey this information in a different manner.

8.2 Pre-Arrival Documentation

Provide electronically to DL_WCS_Shipping_Docs@wcstexas.com on or before the day of departure:

- Final manifest documents if there are changes from the ELITE submission
- Driver(s) name as it appears on their commercial driver license (CDL) and driver's cell phone number
- Notification if the vehicle will arrive with waste or freight not for disposal in the CWF (i.e., brokered shipment on a "milk run")
- Pre-shipment departure radiological survey of the vehicle
- Waste container radiological surveys including fixed and removable contamination and the maximum dose rate at one (1) foot for each item
- Cask shipments only, provide:
    - Radiological survey of the empty cask, including fixed and removable contamination data and dose rate information
    - Maximum contact dose rate on the exterior of the closed primary lid of the loaded cask for ALARA planning

9.0 STEP 6: WASTE SHIPMENT VERIFICATION

Waste verification will be performed on incoming shipments. The method and frequency will depend on the type of waste. See *Appendix 5 - Waste Verification Requirements* for additional details.

The following wastes are excluded from intrusive sampling or inspection due to ALARA and health and safety concerns and will be treated as high container dose rate waste during the generator certification and waste verification processes:

- Waste that could release radon or tritium gas upon opening
- Waste that could release fine, dispersible radioactive particulates upon opening (e.g., ash)
- Biohazard waste
- Waste with sharps from any source

9.1 Non-Compliant Waste or Waste Shipments

- Non-compliant waste containers or shipments will be addressed on a case by case basis through the WCS discrepancy resolution process
- There are three types of discrepancies:
    - **Minor discrepancy** - Discrepancies that do not affect the safe and appropriate management of the waste in accordance with license conditions and regulatory requirements, and do not result in a nonconformance between the waste shipment and the waste profile. (e.g. Department of Transportation (DOT) marking or labeling discrepancies)
    - **Moderate discrepancy** - Discrepancies that would not normally result in a non-compliance with license conditions, but may have minor regulatory impacts. (e.g. a waste form that is otherwise compliant with the license and permits and would require a profile modification with minimal impacts to operations)
    - **Major discrepancy** - Discrepancies identified that could result in a non-compliance with license conditions and/or regulatory requirement that has the ability to adversely affect members of the general public, site employees and/or the environment; to include discrepancies between the characteristics of the shipped waste and the waste profile that are indicative of substantive differences (i.e. wastes that are different in type from that profiled)
- Generator certification status will be affected by repeatedly sending discrepant waste or waste shipments to WCS.
- If the generator chooses, WCS has the capability to mitigate some discrepancies under a separate radioactive materials license at the adjacent processing facility.

9.2 TCEQ Resident Inspector

- The TCEQ resident inspector may inspect every waste shipment and manifest received at the disposal facility for proper classification and characterization prior to waste acceptance.
- As part of the TCEQ inspection process, the TCEQ reserves the right to inspect manifests, waste shipments, and conduct visual inspections and external exposure rate surveys, as well as any other inspection deemed necessary by the TCEQ
- Waste shipment packaging may be inspected for damage or compromised container integrity by the TCEQ
- All waste shipment inspections shall be conducted in accordance with the TCEQ resident inspector inspection procedures
- Waste class verification may also be performed by the TCEQ resident inspector(s) upon

receipt prior to acceptance through inspection procedures

9.3 Transfer of Title of Waste to the State of Texas

- Texas will take title for all low-level radioactive waste upon acceptance for disposal into the Texas Compact disposal facility in accordance with THSC §401.2051
- Acceptance occurs when all waste acceptance criteria specified in license have been satisfied, and WCS and the TCEQ inspector have both approved the shipment for disposal

10.0 GENERAL SITE INFORMATION

10.1 Operational and Business Hours

Normal business hours for the facility are Monday through Friday, 8:00 a.m. to 5:00 p.m. Central Time and WCS recognizes Daylight Savings Time. The facility is closed on the following days: New Years' Day, Good Friday, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and the following Friday, Christmas Day and may close for other observances.

Standard waste shipment receiving hours are Monday through Friday, 7:00 a.m. to 2:00 p.m. Generators may request alternate days and hours for receipt; each request will be evaluated on case-by-case basis by WCS and TCEQ.

10.1.1 Audits and Tours

WCS must approve all audits and tours in advance. WCS requests a 30-day notice for all audits. Tours should be scheduled a minimum of two weeks in advance. Audits and tours are limited to normal business hours of the facility. Contact Customer Service at (888) 789-2783 for scheduling of these activities.

10.1.2 Viewing Waste as it is Received and Disposed

If a customer would like to observe receipt and disposal of their waste, the facility can customize the schedule to accommodate such activities provided adequate notice is given; however, WCS requests that all visits and viewing be limited to normal operational hours. The facility generally knows how many hours or days waste stream handling requires. If a customer would like this service, please advise the Customer Service department at the time of waste profiling, and at the latest, five (5) business days before submission of a shipment request through ELITE.

10.2 Demurrage

It is important that transporters arrive at their allotted receiving time. WCS will not compensate generators or transporters for demurrage charges if the transporter is not checked in with the WCS Security Officer at the Main Guardhouse within 15 minutes on either side of the scheduled arrival time. Excessive unload times due to non-conformances will be the responsibility of the generator.

10.3 Decontamination of Vehicles and Reusable Containers

WCS will release vehicles and reusable containers (i.e., casks) in accordance with 49 CFR 173.428 (DOT Empty) unless other arrangements were made during contract negotiations. WCS will not

decontaminate the interior surfaces of casks that contained irradiated hardware to meet these requirements.

10.4 Customer Service Contact Information

Customer Service can be reached at (432) 525-8500 or (888) 789-2783.

WCS receives US Mail, FedEx and UPS deliveries once per day in the late afternoon. Saturday delivery to the site is not available in WCS' region from US Mail, FedEx or UPS.

US Mail	**FedEx**	**UPS/Courier**
Customer Service	Customer Service	Customer Service
Waste Control Specialists LLC	Waste Control Specialists LLC	Waste Control Specialists LLC
PO Box 1129	9998 W. State Hwy 176	9998 W. State Hwy 176
Andrews, TX 79714-1129	Eunice, NM 88231	Andrews, TX 79714

10.5 Transportation Requirements

10.5.1 Selection of a Transporter

Transporters must be approved by DSHS transportation of LLRW for disposal in Texas. Transporters must submit documents described in DSHS Regulatory Guide 2.19, *Guide for Submission of Documents and Fees by Low Level Radioactive Waste Shippers and Transporters*, at least 14 days prior to the first shipment to DSHS. WCS maintains a current list of DSHS-approved transporters for disposal of LLRW in Texas.

New transporters are welcome to the program, and should contact WCS' Customer Service Department for assistance. All transporters and clients are obligated to meet standard insurance requirements set forth by WCS. The requirements are in the client's Environmental Service Agreement (ESA) or contract document.

10.5.2 Prohibited Items

Weapons are not allowed within the WCS facility. For purposes of this prohibition, "weapons" means firearms, illegal knives, clubs and hoax bombs, all as defined in Section 46.01 of the Texas Penal Code; and also the prohibited items listed in Section 46.05 of the Texas Penal Code. Please note that the list includes, among other things, items such as nightsticks, bowie knives, mace and certain other chemical dispensers (not including small dispensers sold commercially for personal protection). Transporters and other contractors and visitors to WCS site are responsible for familiarizing themselves with the list of prohibited items.

There is no exception from the firearm ban for holders of concealed handgun licenses; they are also not permitted to bring handguns or any of the other prohibited weapons onsite.

Vehicles are subject to search, and those that are discovered to contain a firearm shall be turned away, because WCS does not offer a "check at the gate" option for firearms. Other discovered weapons shall be handled on a case-by-case basis and could also result in turning away the vehicle. WCS shall not be responsible for any delivery delays or demurrages caused by failure to comply with this policy.

Texas Labor Code Chapter 52, Subchapter G, *Restrictions on Prohibiting Employee Transportation or Storage of Certain Firearms or Ammunition* is not applicable to visitors, clients, contractors, generators, brokers or transporters.

Alcoholic beverage containers and illegal drugs are prohibited within the WCS facility.

10.5.3 **Site Access**

- Drivers entering the site must have in their possession a current CDL with a hazardous material endorsement.
- Drivers are not required to have 24- or 40-hour HAZWOPER training, per 29 CFR 1910.
- All drivers are required to wear Level D Personal Protective Equipment (PPE). This includes a reflective safety vest, hardhat, safety eyewear, and safety toe footwear. Trousers must cover the leg and shorts are prohibited for transporters entering WCS.
- Passengers not meeting the same requirements as drivers, minor children and pets will not be granted access.
- Transporters without a complete insurance certificate on file with WCS will not be granted access.

10.5.4 **Upon Arrival at the WCS Facility**

- The Main Guardhouse is open 24 hours per day, 7 days per week.
- Upon arrival, drivers must report to the Main Guardhouse and check in. If arriving outside of business hours, a WCS Security Officer will indicate a safe location to overnight.
- Annually, drivers must complete required reading and an orientation briefing at the Main Guardhouse.
- Each inbound vehicle is also subject to a safety check. At a minimum, lights, turn signals, horn, tire condition, frame, and registration expiration are typically checked. Vehicles with observed fuel, oil, coolant, hydraulic, or other leaks may be denied access. The shipment may subject to surcharge for trans-loading outside our gate and may be subject to a surcharge to correct vehicle and container faults, and/or clean up incident to vehicle leaks or spills.
- The transport vehicle will be escorted to the CWF by WCS staff.

10.5.5 **Transporter Insurance Requirements**

Prior to performing work on WCS (Company) property, Contractor (Transporter) shall maintain at its sole cost, the following types and minimum limits of insurance, with insurers acceptable to Company, unless there are different requirements in the customer's contract documents:

- **Business Auto Liability (and/or excess/umbrella liability):** $5,000,000 each occurrence (bodily injury and property damage combined), for all owned, hired and non-owned vehicles, including trailers, to be utilized in transporting material to a WCS site. Policy must contain an MCS-90 endorsement and an ISO CA 99 48 03 06 (Pollution Liability-Broadened Coverage) endorsement, or equivalent.

- **Workers' Compensation/Employers Liability**: insurance with the following limits:
  - Workers' Compensation – Statutory
  - Employers Liability – $1,000,000 per occurrence

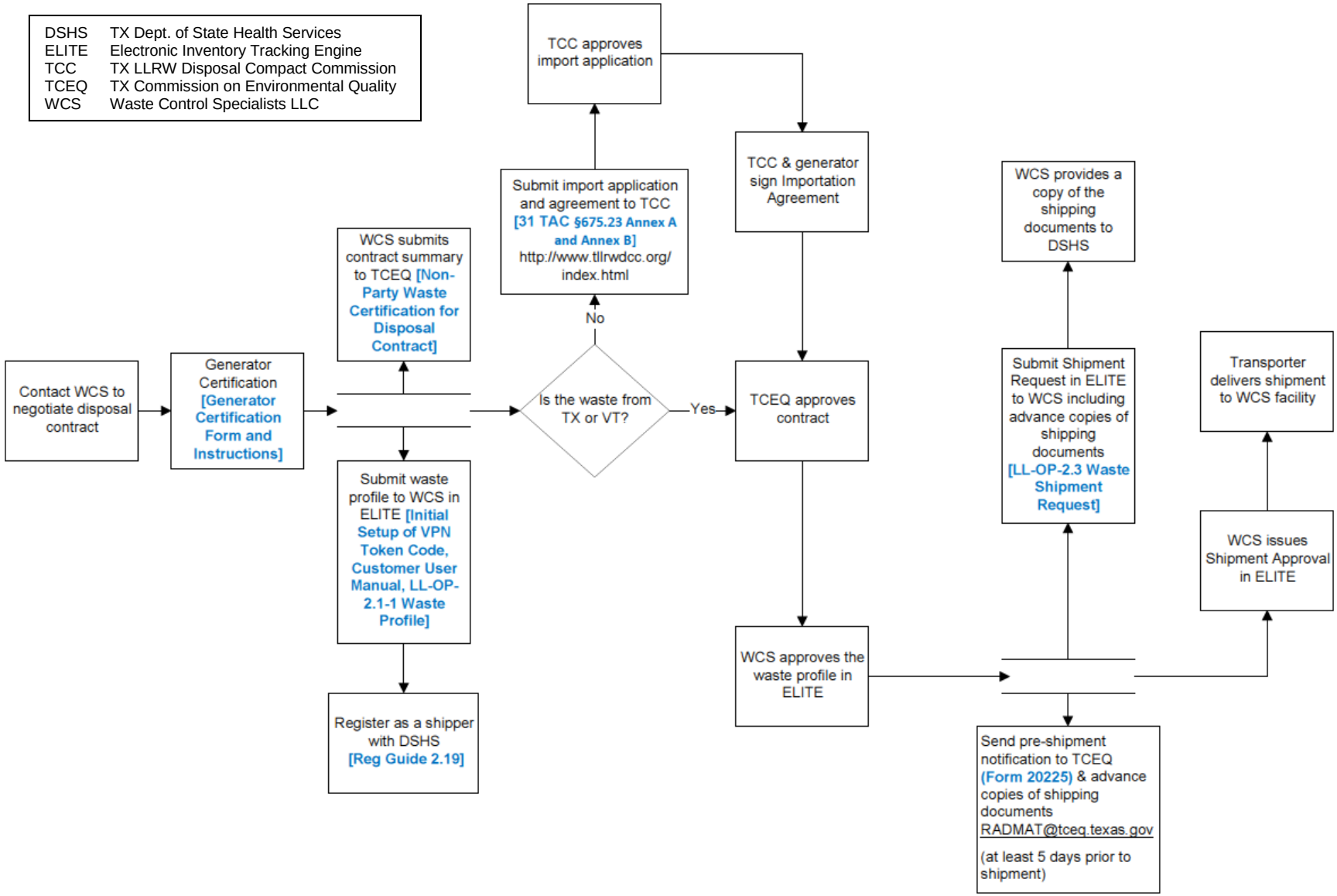
- To the extent permitted by applicable federal, state and local laws and regulations, all insurance policies required must:
  - Name Waste Control Specialists LLC as the certificate holder, and
  - Name Waste Control Specialists LLC as an additional insured, except under any

Workers Compensation or Employer's Liability policy, and
- Specify that insurers have no right of recovery or subrogation against WCS.

Any subcontractors employed by a transporter shall maintain the same level of insurance required of the transporter and shall waive subrogation in favor of WCS as required above, and name WCS as an additional insured as required above. Alternatively, the transporter's insurance policies may be extended to cover Subcontractor(s).

Prior to the inception of any work performed on WCS property, the transporter shall provide WCS with an insurance certificate(s) as evidence that the required insurance is in force. The transporter shall continuously provide renewal certificates to WCS as long as they are performing work on WCS property. All of the transporter's insurance required herein shall be primary to, and shall receive no contribution from any other insurance maintained by, on behalf of, or benefiting WCS. Such certificates shall specify that WCS shall be given (30) days notice prior to cancellation or material change of any of the required policies. If required, the transporter shall provide WCS with the copies of the requested insurance policies.

APPENDIX 1 – GENERATOR PATH TO DISPOSAL



APPENDIX 2 – WASTE STREAM RESTRICTIONS

	Bulk Soil	Bulk Debris	Containerized Soil	Containerized Debris	High Dose Rate Waste	Cask Waste
Waste Form	>50% soil	>50% debris	>50% soil	>50% debris	N/A	N/A
Free Liquids	No visible free liquids	No visible free liquids	< 1%	< 1%	< 1%	< 1%
Dose Rate	< 100 mrem/hr @ 30 cm	< 100 mrem/hr @ 30 cm	At least 10% of containers are <100 mrem/hr @ 30 cm	At least 10% of containers are <100 mrem/hr @ 30 cm	90% of containers are >100 mrem/hr @ 30 cm and ≤1 Rem/hr on contact	>1 rem/hr on contact of the unshielded container
Organic Content	As disposed content cannot exceed 5%, and no shipment can exceed 10%	As disposed content cannot exceed 5%, and no shipment can exceed 10%	N/A	N/A	N/A	N/A
Void Space/ Headspace	N/A	N/A	**LLRW:** Cannot exceed 15% with the exception of irradiated hardware shipments **Large Components:** Minimize to the extent practical			
Chelating Agents	Maximum of 8% by weight, per container, for all waste types (see section 6.2.2)					

APPENDIX 3 – HAZARDOUS, BIOLOGICAL, PATHOGENIC, OR INFECTIOUS WASTE PACKAGING

NOTE: The potential hazard from non-radiological material must be treated to reduce the hazard to the maximum extent practicable before packaging

Step 1

Layering configuration
(Ratio 30 : 1 : 10)

Void filled

30 parts waste (max)

1 part lime +
10 parts absorbent (min)

30 parts waste (max)

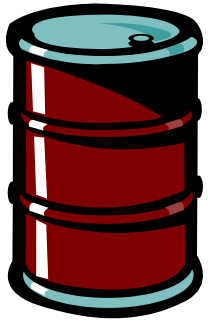
1 part lime +
10 parts absorbent (min)

"Parts" is volume based number.

Step 2

Hermetically sealed, water tight, 4 mil liner

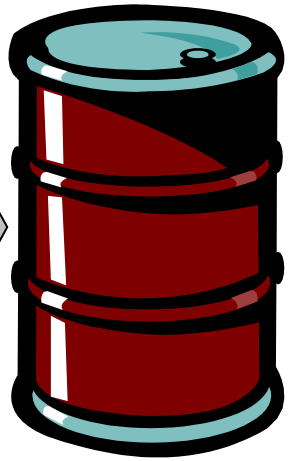
Step 3



Inner container

- No larger than 55 gallon drum
- At least 90% full
- Containers must have ring and bolt closures

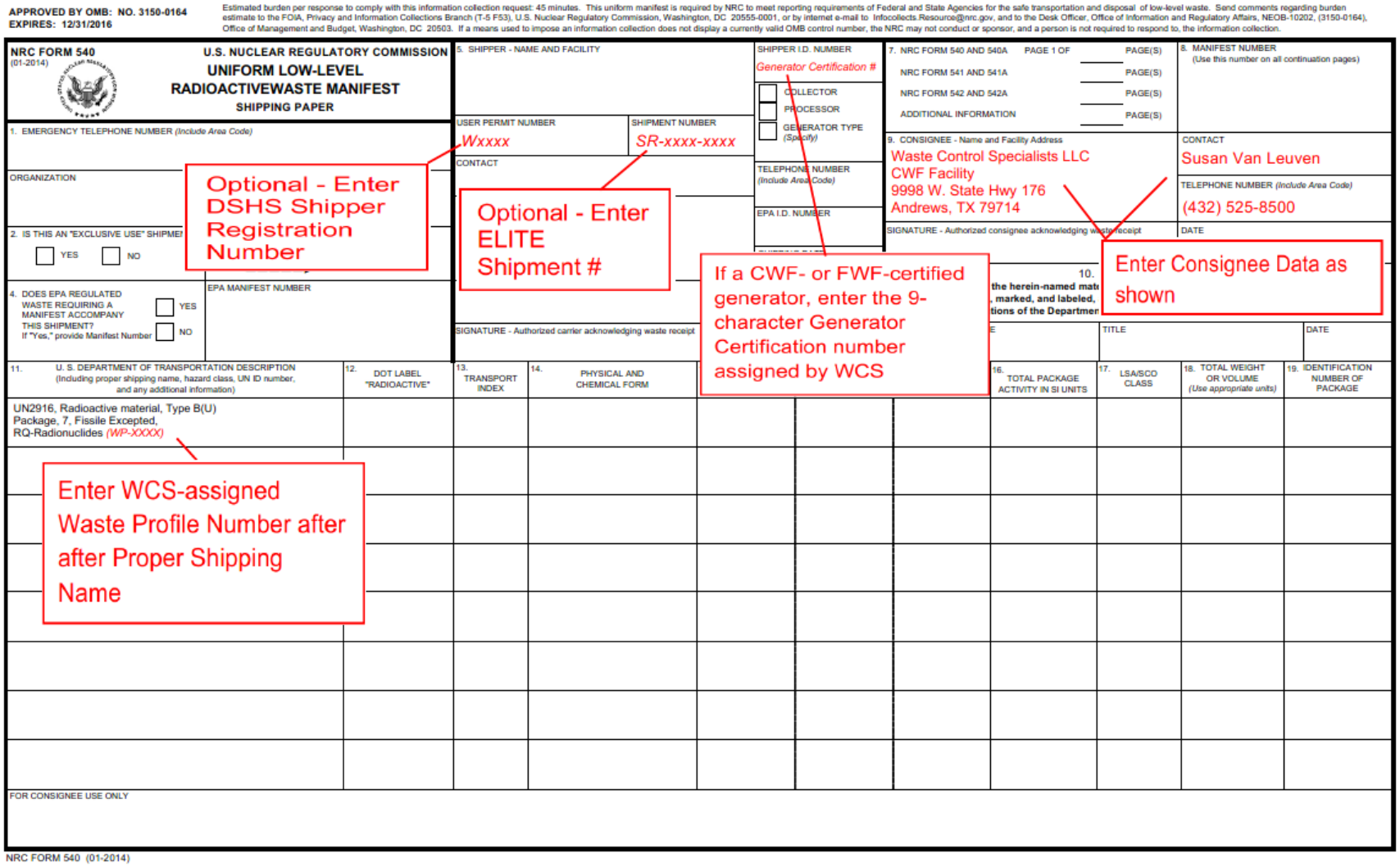
Step 4



Outer drum

- 4" of absorbent in bottom
- Void between 2 containers filled with absorbent
- Drum must be at least 1.5 times the size of the inner drum
  (e.g., 30 gal → 55 gal
  or 55 gal → 85 gal)

APPENDIX 4 – NRC FORM 540/541/542/741 EXAMPLES



APPROVED BY OMB: NO. 3150-0164
EXPIRES: 12/31/2016

Estimated burden per response to comply with this information collection request: 45 minutes. This uniform manifest is required by NRC to meet reporting requirements of Federal and State Agencies for the safe transportation and disposal of low-level waste. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0164), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

NRC FORM 540 (01-2014)

U.S. NUCLEAR REGULATORY COMMISSION
UNIFORM LOW-LEVEL RADIOACTIVEWASTE MANIFEST
SHIPPING PAPER

1. EMERGENCY TELEPHONE NUMBER (Include Area Code)

ORGANIZATION

2. IS THIS AN "EXCLUSIVE USE" SHIPMEI
YES NO

4. DOES EPA REGULATED WASTE REQUIRING A MANIFEST ACCOMPANY THIS SHIPMENT? If "Yes," provide Manifest Number
YES NO

EPA MANIFEST NUMBER

5. SHIPPER - NAME AND FACILITY

USER PERMIT NUMBER: Wxxxx

SHIPMENT NUMBER: SR-xxxx-xxxx

CONTACT

SIGNATURE - Authorized carrier acknowledging waste receipt

SHIPPER I.D. NUMBER: Generator Certification #

COLLECTOR
PROCESSOR
GENERATOR TYPE (Specify)

TELEPHONE NUMBER (Include Area Code)

EPA I.D. NUMBER

7. NRC FORM 540 AND 540A PAGE 1 OF PAGE(S)
NRC FORM 541 AND 541A PAGE(S)
NRC FORM 542 AND 542A PAGE(S)
ADDITIONAL INFORMATION PAGE(S)

8. MANIFEST NUMBER (Use this number on all continuation pages)

9. CONSIGNEE - Name and Facility Address
Waste Control Specialists LLC
CWF Facility
9998 W. State Hwy 176
Andrews, TX 79714

CONTACT: Susan Van Leuven

TELEPHONE NUMBER (Include Area Code): (432) 525-8500

SIGNATURE - Authorized consignee acknowledging waste receipt

DATE

10. the herein-named mate , marked, and labeled, tions of the Departmen

E

TITLE

DATE

11. U. S. DEPARTMENT OF TRANSPORTATION DESCRIPTION (Including proper shipping name, hazard class, UN ID number, and any additional information)	12. DOT LABEL "RADIOACTIVE"	13. TRANSPORT INDEX	14. PHYSICAL AND CHEMICAL FORM				16. TOTAL PACKAGE ACTIVITY IN SI UNITS	17. LSA/SCO CLASS	18. TOTAL WEIGHT OR VOLUME (Use appropriate units)	19. IDENTIFICATION NUMBER OF PACKAGE
UN2916, Radioactive material, Type B(U) Package, 7, Fissile Excepted, RQ-Radionuclides (WP-XXXX)										

FOR CONSIGNEE USE ONLY

NRC FORM 540 (01-2014)

Optional - Enter DSHS Shipper Registration Number

Optional - Enter ELITE Shipment #

If a CWF- or FWF-certified generator, enter the 9-character Generator Certification number assigned by WCS

Enter Consignee Data as shown

Enter WCS-assigned Waste Profile Number after after Proper Shipping Name

FORM 541 — Waste Control Specialists LLC

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST

CONTAINER AND WASTE DESCRIPTION

Additional Nuclear Regulatory Commission (NRC) Requirements for Control, Transfer and Disposal of Radioactive Waste

1. MANIFEST TOTALS

NUMBER OF PACKAGES/ DISPOSAL CONTAINERS	NET WASTE VOLUME	NET WASTE WEIGHT	SPECIAL U-233	SPECIAL U-235

ACTIVITY

	ALL NUCLIDES	TRITIUM	C-14	Tc-99
MBq				
mCi				

2. MANIFEST NUMBER

3. PAGE OF PAGE(S)

4. SHIPPER NAME

SHIPMENT ID NUMBER

Generator Certification Number

Enter 9 character Generator Certification Number assigned by WCS

DISPOSAL CONTAINER DESCRIPTION | WASTE DESCRIPTION

5. CONTAINER IDENTIFICATION NUMBER/ GENERATOR ID NUMBER(S)	6. CONTAINER DESCRIPTION (See Note 1 & Note 1A)	7. VOLUME (m3) / (ft3)	8. WASTE AND CONTAINER WEIGHT (kg) / (ton)	9. SURFACE RADIATION LEVEL (mSv/hr) (mrem/hr)	10. SURFACE CONTAMINATION (MBq/100 cm2) (dpm/100cm2) ALPHA	10. SURFACE CONTAMINATION BETA-GAMMA	PHYSICAL DESCRIPTION 11. WASTE DESCRIPTOR (See Note 2 & Note 2A)	12. APPROXIMATE WASTE VOLUME(S) IN CONTAINER (m3) / (FT3)	13. SOLIDIFICATION OR STABILIZATION MEDIA (See Note 3)	14. CHEMICAL DE… CHEMICAL FORM/ CHELATING AGENT	% CHELATING AGENT IF > 0.1%	…TION INDIVIDUAL RADIONUCLIDES AND ACTIVITY (MBq) AND CONTAINER TOTAL; OR CONTAINER TOTAL ACTIVITY AND RADIONUCLIDE PERCENT RADIONUCLIDES	pCi/gm	MBq	mCi	16. WASTE CLASSIFICATION AS-Class A Stable AU-Class A Unstable B-Class B C-Class C

Enter pCi/g values or submit an Excel spreadsheet with pCi/g data as an attachment to the shipment request

Note 1: Container Description Codes. For containers/ waste requiring disposal in approved structural overpacks the numerical code must be followed by "-OP."

1. Wooden Box or Crate
2. Metal Box
3. Plastic Drum or Pail
4. Metal Drum or Pail
5. Metal Tank or Liner
6. Concrete Tank or Liner
7. Polyethlene Tank or Liner
8. Fiberglass Tank or Liner
9. Demineralizer
10. Gas Cylinder
11. Bulk, Unpackaged Waste
12. Unpackaged Components
13. High Integrity Container
19. Other. Describe in Item 6, or additional page

Note 1A: Bulk Packaging Description Codes. (Choose one code as may be applicable.)

A Gondola
B Intermodal
C End-Dump
D Roll-off
E Seavan

NOTE 2: Waste Descriptor Codes. (Choose up to three which predominate by volume.)

20. Charcoal
21. Incinerator Ash
22. Soil
23. Gas
24. Oil
25. Aqueous Liquid
26. Filter Media
27. Mechanical Filter
28. EPA or State Hazardous
29. Demolition Rubble
30. Cation Ion-exchange Media
31. Anion Ion-exchange Media
32. Mixed Bed Ion-exchange Media
33. Contaminated Equipment
34. Organic Liquid (except oil)
35. Glassware or Labware
36. Sealed Source/Device
37. Paint or Plating
38. Evaporator Bottoms/Sludges/ Concentrates
39. Compactible Trash
40. Noncompactible Trash
41. Animal Carcass
42. Biological Material (except animal carcass)
43. Activated Material
59. Other. Describe in Item 11, or additional page

NOTE 2A: Specific Waste Descriptions (Choose all applicable codes.)

G Dewatered
H Solid
I Combustible
J Non-combustible
K Air Filtration Filters
L Asbestos

Note3: Solidification and Stabilization Media Codes. (Choose up to three which predominate by volume.) For media meeting disposal site structural stability requirements, the numerical code must be followed by "-S." and the media vendor and brand name must also be identified

In Item 13. Code 100=NONE REQUIRED.

Solidification

90. Cement
91. Concrete (encapsulation)
92. Bitumen
93. Vinyl Chloride
94. Vinyl Ester Styrene
99. Other. Describe in Item 13, or additional page
100. None Required.

FORM 542 — Waste Control Specialists LLC

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST

MANIFEST INDEX AND REGIONAL COMPACT TABULATION

List all original "PROCESSED WASTE" generators (if any) before "COLLECTED WASTE" generators.

1. **WASTE COLLECTOR/PROCESSOR**

NAME

IDENTIFICATION NUMBER — *Generator Certification Number*

SHIPPING DATE

Enter 9 character Generator Certification Number assigned by WCS

2. MANIFEST NUMBER

3. **PAGE OF PAGE(S)**

AS PROCESSED/COLLECTED TOTAL

4. GENERATOR IDENTIFICATION NUMBER	5. GENERATOR NAME AND TELEPHONE NUMBER	6. GENERATOR FACILITY ADDRESS	6A. WASTE DESCRIPTION (NOMENCLATURE)	7. PREPROCESSED WASTE (OR MATERIAL) VOLUME (m3)	(ft3)	8. MANIFEST NUMBER(S) UNDER WHICH WASTE (OR MATERIAL) RECEIVED AND DATE OF RECEIPT	9. WASTE CODE P = PROCESSED C = COLLECTED	10. ORIG CO RE OR				C. ACTIVITY (mCi)	D. VOLUME (m3)	(ft3)	E. WEIGHT (tons)	F. MAXIMUM PACKAGE RADIATION LEVEL (mrem/hr)
TOTALS OF ALL PAGES (FORMS 542 AND 542A)																

FORM 542 (03-05)

DOE/NRC FORM 741
(10-2014) Previous editions are obsolete
MANDATORY DATA COLLECTION
AUTHORIZED BY 10 CFR 30, 40, 50, 70, 72, 74, 75, 150
Public Laws 83-703, 93-438, 95-91

U. S. DEPARTMENT OF ENERGY AND U. S. NUCLEAR REGULATORY COMMISSION

NUCLEAR MATERIAL TRANSACTION REPORT

APPROVED BY OMB: NO. 3150-0003 **EXPIRES: 10/31/2017**

Estimated burden per response to comply with this mandatory collection request: 1 hour and 15 minutes. This information is required for IAEA accounting reports that show changes in inventory of nuclear materials. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0003), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. SHIPPER'S RIS	2. RECEIVER'S RIS	3. TRANSACTION NO.	4. CORRECTION NO.	5. PROCESSING CODE a. SHIPPER	5. PROCESSING CODE b. RECEIVER	6. ACTION CODE a. SHIPPER	6. ACTION CODE b. RECEIVER	7. DOCUMENTATION (Only if document is classified SECRET) PAGE	OF	PAGES	COPY	OF	COPIES	SERIES
	VAD													

8.a. NAME AND ADDRESS OF SHIPPER	b. LICENSE NO.	9.a. NAME AND ADDRESS OF RECEIVER	b. LICENSE NO.	10. NO OF DATA LINES	11. NATURE OF TRANSACTION
c. ATTENTION:		Waste Control Specialists LLC Compact Waste Disposal Facility 998 W. State Hwy 176 Andrews, TX 79714 c. ATTENTION: Tom Hannah	R04100	12.a. SHIPPED FOR ACCOUNT OF b. RIS	13.a. SHIPPED TO ACCOUNT OF b. RIS
d. TELEPHONE:		d. TELEPHONE: (432) 525-8500			

NO.	DISTRIBUTION OF COPIES
1	
2	VAD
3	
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9	

14. TRANSFER AUTHORITY - CONTRACT, NM DRAFT, OR ORDER NUMBER

15. EXPORT OR IMPORT TRANSFERS: LICENSE NO.

16. MATERIAL TYPE AND DESCRIPTION

18. COUNTRY OF OBLIGATION	19. MATERIAL TYPE	20. OBLIGATED ELEMENT WEIG	21.

2. ACTION DATE	MONTH (MM)	DAY (DD)	YEAR (YYYY)
ENT			
ER'S CORRECTION			
PT			
VER'S MEASUREMENT			
VER'S CORRECTION			

Enter 541 gross weight in whole kg

Enter 541 volume in whole ft^3

23a. MISCELLANEOUS

Enter 540 Manifest Number

b. CONCISE NOTE ATTACHED

c. UK REPORTABLE?

24. TOTAL GROSS WEIGHT

25. TOTAL VOLUME *(Waste Transfers Only)*

26. SHIPPER'S DATA

BACK REFERENCE NUMBER a.	LINE NO. b.	TYPE OF INV. CHANGE c.	IDENTIFICATION (ITEM/BATCH NAME) d.	NO. OF ITEMS e.	PROJECT NUMBER f.	MATE-RIAL TYPE g.	COMP/ FACILITY CODE h.	OWNER CODE i.	KEY MEAS. POINT j.	MEAS. IDENT. k. 1 BASIS	2 OMP	3 METHOD	GROSS WEIGHT l.	NET WEIGHT m.	ELEMENT WEIGHT n.	ELEMENT LIMIT OF ERROR o.	WEIGHT % ISOTOPE p.	ISOTOPE WEIGHT q.	ISOTOPE LIMIT OF ERROR r.

↑ ↑ ↑ **26s. SHIPPER'S DATA** SIGNATURE OF AUTHORIZED OFFICIAL AND DATE SIGNED

↓ ↓ ↓ **27s. RECEIVER'S DATA** SIGNATURE OF AUTHORIZED OFFICIAL AND DATE SIGNED

27. RECEIVER'S DATA

WARNING: FALSE STATEMENTS IN THIS CERTIFICATE MAY BE SUBJECT TO CIVIL AND/OR CRIMINAL PENALTIES. NRC REGULATIONS REQUIRE THAT SUBMISSIONS TO THE NRC BE COMPLETE AND ACCURATE IN ALL MATERIAL RESPECTS. 18 U.S.C. SECTION 1001 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

APPENDIX 5 – WASTE VERIFICATION REQUIREMENTS

	Bulk Soil	Bulk Debris	Containerized Soil	Containerized Debris	High Dose Rate	Cask Waste
Pre-shipment sample	Required	N/A	Required	N/A	N/A	N/A
Intrusive Visual Inspection	100%	100%	10% of containers from each profiled waste stream per shipment	10% of containers from each profiled waste stream per shipment	N/A	N/A
Intrusive sampling/ analysis	For each profiled waste stream: The first 10 shipments, and 10% thereafter	N/A	10% of containers from each profiled waste stream per shipment	N/A	N/A	N/A
External Radiologic Analysis	N/A	10%	N/A**	10% of containers from each profiled waste stream per shipment	10% of containers from each profiled waste stream per shipment	100%

** External radiologic analysis may be performed in lieu of direct sample analysis is appropriate

APPENDIX 6 – PRE-SHIPMENT SAMPLE ANALYSIS REQUIREMENTS

Pre-shipment sample analysis for containerized and bulk soil-like waste

Radiological Classification, Characterization, and Fingerprinting

- Gamma spectroscopy (HASL-300)
- Gross alpha and gross beta (HASL-300)
- Non-gamma emitting radionuclides (HASL-300/ alpha spectroscopy/ liquid scintillation)
- Scaling factors may be used if the process has been validated with direct measurements

Chemical/Physical Fingerprint Analysis

- Free liquids (SW-846 Method 9095)
- Reactivity/water compatibility (ASTM D5058 or equivalent)
- Cyanide screen (ASTM D5059 or equivalent)
- Sulfide screen (ASTM D4978 or equivalent)
- pH/corrosivity (ASTM D4980 or equivalent)
- Flammability (ASTM D4982 or equivalent)
- Density (ASTM D5057 or equivalent)

Hazardous Characterization Verification

- Ignitability, corrosivity, and reactivity, D001- D003 (SW-846)
- Toxicity characteristics, D004-D043 (SW-846 TCLP or Totals)

Bulk Soil only

- Soil classification (ASTM D2487/ AASHTO M 145 or equivalent)
- Moisture density relationship (ASTM D1557 or equivalent)
- Total organic content (ASTM D2974/ AASHTO T 267 or equivalent)
- Standard proctor (ASTM D698 or equivalent)

REFERENCES

10 CFR §20.1003, *Definitions*.

10 CFR §61, *Licensing Requirements For Land Disposal Of Radioactive Waste*.

49 CFR, *Transportation*.

30 TAC §25.6, *Conditions Under Which the Commission May Accept Analytical Data*, http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=30&pt=1&ch=25&rl=6

30 TAC §336.229, *Prohibition of Dilution*, http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=30&pt=1&ch=336&rl=229

30 TAC §336.362, Appendix E, *Classification and Characteristics of Low-Level Radioactive Waste*, http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=30&pt=1&ch=336&rl=362

30 TAC §336.745, *Incidental Commingling of Waste.* http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=30&pt=1&ch=336&rl=745

31 TAC §675.23, *Importation of Waste from a Non-Compact Generator for Disposal*, http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=31&pt=21&ch=675&rl=23

DSHS Regulatory Guide 2.19, *Guide for Submission of Documents and Fees by Low Level Radioactive Waste Shippers and Transporters*, http://www.dshs.state.tx.us/radiation/regguide.shtm

NRC, 1983, *Low-Level Waste Licensing Branch Technical Position on Radioactive Waste Classification*, http://pbadupws.nrc.gov/docs/ML0336/ML033630755.pdf

NRC, 1983, *Technical Position on Waste Form,* from *Final Waste Classification and Waste Form Technical Position Papers,* http://pbadupws.nrc.gov/docs/ML0336/ML033630755.pdf (*Waste Form* starts on page 16 of 27)

NRC, 1995, *Branch Technical Position on Concentration Averaging and Encapsulation, Revision in Part to Waste Classification Technical Position*, http://pbadupws.nrc.gov/docs/ML0336/ML033630732.pdf

NRC, 2015, *Branch Technical Position on Concentration Averaging and Encapsulation, Revision 1, Volume 1,* http://pbadupws.nrc.gov/docs/ML0336/ML033630732.pdf

NRC 2015 Concentration Averaging Technical Position, Implementation Questions and Answers, October 30, 2015, http://pbadupws.nrc.gov/docs/ML1530/ML15303A109.pdf

NRC Form 540, *Uniform Low-Level Radioactive Waste Manifest - Shipping Paper*. PDF form for data entry at http://www.nrc.gov/reading-rm/doc-collections/forms/nrc540.pdf and http://www.nrc.gov/reading-rm/doc-collections/forms/nrc540a.pdf

NRC Form 541, *Uniform Low-Level Radioactive Waste Manifest - Container and Waste Description*. PDF form for data entry at http://www.nrc.gov/reading-rm/doc-collections/forms/nrc541.pdf and http://www.nrc.gov/reading-rm/doc-collections/forms/nrc541a.pdf

NRC Form 542, *Uniform Low-Level Radioactive Waste Manifest - Manifest Index and Regional Compact Tabulation*. PDF form for data entry at http://www.nrc.gov/reading-rm/doc-collections/forms/nrc542.pdf and http://www.nrc.gov/reading-rm/doc-collections/forms/nrc542a.pdf

NRC Form 741, *Nuclear Material Transaction Report*. PDF form for data entry at http://www.nrc.gov/reading-rm/doc-collections/forms/nrc741.pdf

NUREG/BR-0006, *Instructions for Completing Nuclear Material Transaction Reports* http://www.nrc.gov/reading-rm/doc-collections/nuregs/brochures/br0006/

NUREG/BR-0204, Instructions *for Completing NRC's Uniform Low-Level Radioactive Waste Manifest*, July 1998, http://www.nrc.gov/reading-rm/doc-collections/nuregs/brochures/br0204/

TCEQ Form 20225, *Texas Compact Waste Shipment Verification Form.* http://www.tceq.texas.gov/assets/public/permitting/rad/Waste_Generator_Disposal_Guide/WSV_Form_20225_and_Instructions.docx

TCEQ, *List of Laboratories Accredited by the State of Texas under the National Environmental Laboratory Accreditation Program (NELAP)*. www.tceq.state.tx.us/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf.

Texas Health and Safety Code §401.207, *Out-Of-State Waste; Nonparty Compact Waste,* http://www.statutes.legis.state.tx.us/Docs/HS/htm/HS.401.htm

Texas Health and Safety Code §401.2051, *Conveyance of Waste,* http://www.statutes.legis.state.tx.us/Docs/HS/htm/HS.401.htm

Texas Labor Code Chapter 52, Subchapter G, *Restrictions on Prohibiting Employee Transportation or Storage of Certain Firearms or Ammunition*. http://www.statutes.legis.state.tx.us/Docs/LA/htm/LA.52.htm

Texas Penal Code Chapter 46, *Weapons*. http://www.statutes.legis.state.tx.us/docs/PE/htm/PE.46.htm