



THE TEXAS SOLUTION

**Storage and
Processing Facility
(TSDF)
Generator Handbook**

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Acronyms and Abbreviations

AASHTO	American Association of State Highway and Transportation Officials
ACM	Asbestos Containing Material
AEA	Atomic Energy Act, as amended
AFA	Authorized Federal Agency
ALARA	As Low As Reasonably Achievable
ASTM	American Society for Testing and Materials
atm	Atmospheres
BSA	Bin Storage Area (subdivision of BSU)
BSU	Bin Storage Unit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
cm	Centimeter
CSA	Container Storage Area (subdivision of CSB)
CSB	Container Storage Building
CWF	Compact Waste Disposal Facility
DAW	Dry Active Waste
DEA	U.S. Drug Enforcement Agency
DOE	U.S. 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
HAZWOPER	Hazardous Waste Operations and Emergency Response
HCD	High Container Dose
IATA	International Air Transport Association
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
LSA	Low Specific Activity
LVS	US Nuclear Regulatory Commission License Verification System
μCi	Microcurie
MCC	Modular Concrete Canister
mil	1/1000 th of an inch
mrem/hr	Millirem per hour
NA	Not Applicable
nCi/g	nanocurie per gram
NELAC	National Environmental Laboratory Accreditation Conference
NESHAP	National Emission Standards for Hazardous Air Pollutants
NMMSS	DOE / NRC Nuclear Materials Management & Safeguards System
NNSS	Nevada Nuclear Security Site [formerly Nevada Test Site (NTS)]
NORM	Naturally Occurring Radioactive Material
NRC	Nuclear Regulatory Commission
PCB	Polychlorinated Biphenyl
pCi/g	picocurie per gram
PPE	Personal Protective Equipment
ppm	Parts per Million

QA/QC	Quality Assurance/Quality Control
RACM	Regulated Asbestos Containing Material
Rem/hr	Rem per Hour
RCRA	Resource Conservation and Recovery Act
R&D	Research and Development
RIS	Reporting Identification Symbol
RML	Radioactive Materials License
RRC	Railroad Commission of Texas (regulates oil and gas industry, not trains)
RTS	Return to Service
SDS	Safety Data Sheet
SNM	Special Nuclear Material
SS&D	Sealed Sources and Devices
SWR	Solid Waste Registration
TAC	Texas Administration Code
TCEQ	Texas Commission on Environmental Quality
TENORM	Technologically Enhanced Naturally Occurring Radioactive Material
THSC	Texas Health and Safety Code
TLLRWDC	Texas Low Level Radioactive Waste Disposal Compact Commission aka Texas Compact Commission (TCC)
TRU	Transuranic
TSCA	Toxic Substances Control Act
UHC	Underlying Hazardous Constituent
UHW	Uniform Hazardous Waste Manifest
ULLRW	Uniform Low Level Radioactive Waste Manifest
UTS	Universal Treatment Standards
VOC	Volatile Organic Compound
VR	Volume Reduction
WAP	Waste Analysis Plan
WCS	Waste Control Specialists LLC
wt%	percentage by weight

1.0 OVERVIEW

This handbook provides guidance and specific criteria on WCS capabilities and waste acceptance criteria at the Storage and Processing Facility (TSDF) in compliance with WCS licenses, permits and procedures.

WCS is permitted, licensed, or otherwise authorized to store, process and/or dispose of the following waste types:

- Industrial non-hazardous waste as defined by the Texas Administrative Code (TAC)
- Hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA), as amended
- Licensed low level radioactive waste (LLRW) as defined by the Atomic Energy Act (AEA), as amended
- By-product material as defined by 30 TAC §336.1105
- Polychlorinated biphenyl (PCB) waste as defined by the Toxic Substances Control Act (TSCA), as amended
- US Environmental Protection Agency (EPA) Regulated Asbestos Containing Material (RACM) [National Emissions Standards for Hazardous Air Pollutants (NESHAP) and TSCA]
- Exempt Radioactive Waste as defined by 30 TAC §336.5 – including Naturally Occurring Radioactive Material (NORM) and Technologically Enhanced Naturally Occurring Radioactive Material (TENORM)

1.1 Disposal Facilities at WCS

WCS has four adjacent disposal facilities:

- **Resource Conservation and Recovery Act (RCRA)/Toxic Substances Control Act (TSCA)-permitted landfill** (Subtitle C Landfill aka RCRA/TSCA Landfill) is a part of the TSDF and accepts industrial waste, land disposal restriction (LDR)-compliant hazardous waste, CERCLA waste, solid PCB waste in unlimited concentration and exempt radioactive waste.
- **Compact Waste Disposal Facility (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 Compact Commission. The CWF is not permitted to accept TSCA-regulated PCB wastes or hazardous wastes.
- **Federal Waste Disposal Facility (FWF)** accepts LLRW and Low Level Mixed Waste (LLMW) that is the responsibility of the Federal government under the LLRW Policy Act as amended by the LLRW Policy Amendments Act of 1985 [Department of Energy (DOE) waste, U.S. Navy vessel decommissioning waste, government atomic weapons Research and Development (R&D), testing or production waste, excluding Greater than Class C]. Acceptable wastes include LDR-compliant hazardous waste, hazardous debris for macroencapsulation, CERCLA waste and solid PCB waste in unlimited concentration.
- **By-product Material Disposal Facility (By-product)** is not presently accepting additional wastes, and is not permitted to accept TSCA-regulated PCB wastes or hazardous wastes.

1.2 Storage Locations and Capabilities at the Storage and Processing Facility

1.2.1 Container Storage Building (CSB)

The CSB is divided into 10 Container Storage Areas (CSA) with a rated capacity of 275,000 gallons (5000 55-gallon drum equivalents). The CSB is authorized to store all types of wastes acceptable for receipt at WCS. There is an automatic fire suppressant system, the floors are coated and diked to contain liquids and separate wastes.

1.2.2 Bin Storage Units (BSU)

1.2.2.1 BSU 1

The rated storage capacity for BSU 1 is 3,510 cubic yards, of which 1,000 cubic yards may be land-disposal restricted (untreated or not LDR compliant) waste. BSU 1 is divided into three (3) Bin Storage Areas (BSA). Each BSA has a total storage capacity of 1,170 cubic yards.

- BSA 1 is a weather enclosure with a coated and diked floor to contain liquids. BSA 1 is permitted to store radioactive waste, liquids and is a TSCA-authorized storage location.
- BSA 2 and 3 are uncovered, coated, and diked storage areas and are not permitted to store liquids or PCBs.

1.2.2.2 BSU 2

BSU 2 is a paved storage area with a rated capacity of 3,240 cubic yards, of which 2,160 cubic yards may be land-disposal restricted waste (untreated or not LDR compliant).

1.2.3 Low Specific Activity (LSA) Pad

The LSA Pad is a paved area that may act as part of the Storage and Processing Facility, CWF or FWF depending on the situation. Radioactive wastes requiring use of shipping casks, cranes and heavy equipment may be stored at this location. Non-radioactive, mixed wastes and PCB waste cannot be stored at this location.

1.3 Processing Capabilities at the Storage and Processing Facility

The TSDF provides a wide variety of processing services. This section provides a general summary of these services. Please discuss specific storage and processing requirements with WCS as additional options may be available.

1.3.1 Storage Prior to RCRA/TSCA, CWF or FWF Disposal

WCS can store waste generally for up to 365 days. A path forward must be identified during waste profiling. Common situations and paths forward include and are not limited to:

- Storage pending importation approval to the CWF
- Resizing to meet modular concrete canister (MCC) dimensions prior to disposal at the CWF or FWF
- Storage pending transportation to another TSDF
- Storage pending exempt authorizations
- Storage over 365 days with regulatory and contractual approval, to include commercial Greater than Class C (GTCC) wastes

1.3.2 Shredding of Debris

WCS can shred debris prior to treatment, as volume reduction action, or as item destruction action. The resulting shredded waste may no longer meet the definition of debris and can be treated to meet the normal LDR standards found in 40 CFR §268.40. Limitations on shredding are:

- No steel, cast iron, etc., may be greater than ¼" thick
- No large objects or quantities of soft metal such as copper, aluminum, lead, brass, etc.
- No electrical motors or equipment transmissions
- No gas or pressurized cylinders or cans
- Maximum dimensions on sheeting-type material (such as wood, construction debris, etc.) are 4' x 4' x 2'
- Maximum dimensions on concrete-type material is 3' x 3' x 2' with a maximum weight of 1,000 pounds per piece

NOTE:

Beginning September 1, 2015 imported waste disposed at the CWF must be volume reduced (if feasible) by at least a factor of 3, with limited exceptions. [Texas Health and Safety Code (THSC) §401.207] Contact WCS for information regarding acceptable practices for meeting this requirement.

If volume reduction (VR) of the waste stream would result in a change of waste classification to a class higher than Class C, then the VR requirement does not apply.

1.3.3 Dewatering/Void Filling of Radioactive Waste Liners

WCS can perform dewatering/void filling of radioactive waste liners.

1.3.4 Compacting of Debris

WCS can compact waste prior to disposal with a volume reduction ratio of approximately three (3) to one (1) for dry active waste (DAW). Items prohibited from compacting include free or absorbed liquids, explosives, compressed gases and items that cannot be compacted (e.g., engines, transmissions, metal blocks).

NOTE:

Beginning September 1, 2015 imported waste disposed at the CWF must be volume reduced (if feasible) by at least a factor of 3, with limited exceptions. (THSC §401.207) Contact WCS for information regarding acceptable practices for meeting this requirement.

If VR of the waste stream would result in a change of waste classification to a class higher than Class C, then the VR requirement does not apply.

1.3.5 Sorting and Segregation

WCS performs sorting and segregation of debris to remove and address items prohibited from disposal. Waste will be examined and remediated for free and containerized liquids, intact aerosol cans, compressed gases, batteries, reagents, circuit/electrical boards, lamps and ballasts, biological waste and related items. Also, unsuitable labeling will be removed and/or defaced. Other sorting and segregation processes may be available. Please contact WCS for more information.

1.3.6 Characterization by Gamma Spectroscopy

WCS performs *in-situ* gamma spectroscopy of virtually any waste media with gamma-emitting isotopes. Please contact WCS for more information that may be specific to your project.

1.4 Hazardous Waste and LLMW Treatment Capabilities at the Storage and Processing Facility**1.4.1 RCRA Treatment Technologies**

WCS is permitted by the TCEQ to store, treat and dispose of non-radioactive hazardous waste and low level mixed waste (LLMW). LLMW that remains licensed can be disposed in the FWF (Federal Waste only) and LLMW that is exempted prior to disposal will be disposed in the RCRA landfill of the Processing Facility (Commercial waste and Federal Waste). Commercial LLMW must meet the criteria found in Section 7.0 of this handbook unless the RCRA waste codes can be removed during the treatment process and meet the disposal requirements of the CWF. Liquids will be stabilized as part of treatment and evaluated against the non-wastewater treatment standards of 40 CFR §268.40. WCS uses stabilization, neutralization and oxidation/reduction treatment processes to treat waste codes that have concentration based LDR standards listed in 40 CFR §268.40. In addition, WCS possesses the capability to perform the following treatment technologies for waste codes that have performance based LDR standards listed in 40 §Part 268.40 (See 40 CFR §268.42 for a detailed description of each technology):

- CHOXD – Chemical oxidation
- CHRED – Chemical reduction
- DEACT – Deactivation
- NEUTR – Neutralization
- STABL – Stabilization
- MACRO – Macroencapsulation

1.4.2 Alternate Treatment Standards for Soil

WCS is permitted to treat and dispose of hazardous waste classified as soil by complying with the alternate treatment standards for soil in 40 CFR §268.49(c)(1)-(3).

1.4.3 Alternate Treatment Standards for Waste Debris

WCS is permitted to treat, store and dispose of hazardous waste classified as debris that is subject to the alternate treatment standards in 40 CFR §268.45. By permit, WCS can perform limited Physical Extraction, Chemical Extraction or Chemical Destruction as defined in Table 1 of 40 CFR §268.45; however, WCS mainly uses Macroencapsulation (MACRO) and Microencapsulation (MICRO) as defined in Table 1 of 40 CFR §268.45 to treat hazardous debris.

1.4.4 VOC content limits

For non-radioactive waste, the Volatile Organic Compound (VOC) concentration limit is 500 ppm total. For LLMW, the VOC and SVOC limits may vary depending upon the specific compounds in question and the matrix of the waste stream. The overall VOC limit for LLMW is 20%. Each waste stream is handled on a case-by-case basis. For purposes of this requirement, organic compounds that have a vapor pressure equal to or greater than .01 mmHg at 104 degrees Fahrenheit are considered VOCs. Any organic compound with a vapor pressure less than .01 mmHg at 104 degrees Fahrenheit are not considered VOC's and should not be included in calculations used to determine VOC concentration.

1.5 RCRA Hazardous Waste Codes – Restricted to Storage Only

WCS is permitted to store, but not treat or dispose, up to 5 55-gallon drums of waste containing the following RCRA hazardous waste codes as they are regulated for dioxin and chlorodibenzofuran constituents:

- F020, F021, F022, F023, F026, F027

1.6 RCRA Hazardous Waste Codes – Receipt and Disposal Prohibitions

While WCS is permitted to receive most RCRA hazardous waste codes, there are categories of waste that WCS is prohibited from accepting. These categories include the following:

- D001 flammable solids that are also considered pyrophoric in accordance with DOT regulations [– i.e. white phosphorous]
- D001 ignitable compressed gas [40 CFR §261.21(a)(3)] – i.e., pressurized gases, including those contained in compressed gas cylinders such as acetylene
- D001 liquid organic peroxides [40 CFR §261.21(a)(4)(i)(C)] – i.e., any liquid organic (carbon-containing) compound having two oxygen atoms joined together (-O-O-) such as methyl ethyl ketone peroxide
- D003 explosives [40 CFR §261.23(a)(6)] – i.e., explosives as defined by the DOT including detonators, shock tubes, boosters, charges, initiators and bulk powder

1.7 Subtitle C Landfill – Disposal of Waste Compliant with Land Disposal Restrictions (LDR) Treated with Specified Technologies by Others

WCS does not possess the following specified technologies but may dispose of waste carrying the codes required to be treated by the specified technology per 40 CFR §268.40 if treated by others to comply with LDR:

- CMBST i.e. D001 – High total organic carbon (TOC) subcategory
- RORGS i.e. D001 – High TOC subcategory
- POLYM i.e. D001 – High TOC subcategory- >10% TOC
- RTHRM i.e. D006 – Cadmium Containing Batteries Subcategory
- RMERC i.e. D009 – High Mercury Subcategory >260 ppm total mercury
- RLEAD i.e. D008 – Lead Acid Batteries Subcategory
- WETOX i.e. P031 – Cyanogen
- ADGAS i.e. P056 – Fluorine
- RMETL i.e. P015 – Beryllium Dust
- RTHRM i.e. P015 – Beryllium Dust

1.8 Limitations

1.8.1 Chelating agents

- Subtitle C Landfill - No limitations for each waste profile pending disposal at the Subtitle C Landfill
- CWF and FWF - Limited to 8% by weight for each waste package pending disposal at the CWF or FWF.

1.8.2 Free liquids

- All waste shipped to the RCRA/TSCA landfill for direct disposal must not contain free liquids as verified by a paint filter test. Absorbents used to absorb free liquids prior to shipment to WCS must be non-

biodegradable and capable of absorbing the liquids. There is not an approved list of absorbent agents and WCS may request safety data sheets for the agent(s) as part of the waste profile process.

- Free liquids are acceptable for processing provided there is a contract mechanism in place for such processing and the package selected for shipment is designed to contain free liquids.

1.8.3 Void Filling/Solidification Agents

Void filling/solidification agents for the Subtitle C Landfill, CWF and FWF are required to be non-biodegradable. Examples are vermiculite, perlite and concrete. There is not an approved list of void filling/solidification agents and WCS may request safety data sheets for the agent(s) as part of the waste profile process.

1.8.4 Waste Packaging

- Each package or container shall only contain one approved profiled waste stream. See Section 6.0 for combining regulatory categories in a single profile.
- Containerized waste that will be disposed in intact containers within in the Subtitle C Landfill due to health and safety concerns must be at least 90% full. This includes drums of asbestos waste, beryllium wastes, properly prepared infectious, biological, etiologic or pathological wastes and may apply to other wastes. Weight restrictions may apply, but in no case shall the package weight exceed the certified maximum weight for the package.
- Packages shipped in an enclosed van trailer should weigh 10,000 lbs. or less unless special arrangements have been made.
- 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).

1.8.5 Tires

WCS does not accept tires that may be managed at permitted scrap-tire disposal sites, scrap-tire processors, energy-recovery facilities, transportation facilities, land-reclamation projects using tires, or tire-storage sites. WCS can accept tires contaminated with PCBs, hazardous waste or radioactive contamination. Scrap tires that have been split, quartered, or shredded may be disposed in Texas. Tires, and their condition upon receipt at WCS, must be documented in the waste profile and shipment request documents. Undeclared tires and intact tires requiring splitting, quartering or shredding may be subject to surcharges and/or be declared non-conforming waste.

1.8.6 Water Reactive Metals

While WCS is permitted to treat water reactive metals, we do not currently possess a safe treatment process for these wastes. Therefore, WCS is currently not accepting this type of waste for treatment. Please contact your sales representative if this is a waste stream that you would like WCS to consider.

1.9 Subtitle C Landfill – Disposal Prohibitions

The term “unacceptable” is not limited to those wastes that are unacceptable due to permit or license constraints. It also covers those wastes for which the facility has not developed the expertise in managing or for other causes.

1.9.1 Unacceptable Waste Items

- Material that is not waste
- Waste items not declared as part of the approved waste profile
- Infectious, biological, etiologic or pathological wastes (e.g., untreated medical waste, untreated animal carcasses not prepared in accordance with Section 6.2)
- Special Waste from Health-Care Related Facilities subject to 25 TAC §1 or 30 TAC §330
- Municipal garbage
- Putrescible wastes
- Containerized liquids – i.e., liquid paint in cans, free liquids in drums or boxes, spray bottles with fluid, plastic bags with visible free liquids and insufficient absorbent
- Wastes with free liquids that would fail the paint filter test (EPA SW-846 Method 9095)
- Compressed gases at greater than atmospheric pressure (i.e., intact/unpunctured aerosol cans, gas cylinders)
- Licensed radioactive waste unless it is managed in accordance with Section 7.0 of this handbook

- Rechargeable batteries (including lithium, cadmium and lead acid batteries), silver batteries and mercury batteries
- Fluorescent and incandescent lamps (light bulbs)
- Scrap tires that can be handled by permitted scrap tire management organization. Also, contaminated scrap tires that are not split, quartered or shredded

1.9.2 Unacceptable RCRA Treatment Technologies

WCS cannot landfill waste codes assigned the specified technologies/subcategory combinations under any circumstance in the Subtitle C Landfill:

- HLVT Vitrification of High Level Mixed Radioactive Waste
- MACRO D008 Radioactive Lead Solids Subcategory unless it is managed in accordance with Section 7.0 of this handbook.
- IMERC D009 Hydraulic Oil Contaminated with Mercury Radioactive Subcategory unless it is managed in accordance with Section 7.0 of this handbook.
- AMLGM Amalgamation of Liquid, Elemental Mercury Contaminated with Radioactive Materials unless it is managed in accordance with Section 7.0 of this handbook.

2.0 DEFINITIONS

2.1 Bulk Packaging

Bulk packaging means a packaging, other than a vessel or a barge, including a transport vehicle or freight container, in which hazardous materials are loaded with no intermediate form of containment. A Large package in which hazardous materials are loaded with an intermediate form of containment, such as one or more articles or inner packages, is also a bulk package. Additionally, bulk packaging has:

- A maximum capacity greater than 450 L (119 gallons) as a receptacle for a liquid
- A maximum net mass greater than 400 kg (882 pounds) and a maximum capacity greater than 450 L (119 gallons) as a receptacle for a solid
- A water capacity greater than 454 kg (1000 pounds) as a receptacle for a gas as defined in 49 CFR §173.115

2.2 Bulk Waste Loads

Bulk waste loads are wastes generally packaged in reusable containers greater than 10 cubic yards. Examples are rolloffs, end dumps, gondolas and intermodal boxes. In some cases, where a large volume waste profile is consistent but packaged for ease of transportation or disposal as smaller containers (e.g., supersacks in a gondola, cubic yard bags on a flatbed), the load may be managed as a bulk waste load. Bulk waste load and bulk load have the same meaning.

2.3 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.

2.4 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 CWF.

2.5 Containerized Waste

Waste that is received in a container and the container is placed in the disposal facility for disposal. Containerized waste containers are not intended for reuse. Containerized waste that must remain intact during disposal in the Subtitle C Landfill must be at least 90% full. At the CWF and FWF, containerized waste is disposed within MCCs. Dimensions of the standard sized MCCs are listed in Section 5.2.6. For the purposes of radiological exemption using LC 192, the container size is <100 cubic feet.

2.6 Debris

Debris means solid material exceeding a 60 mm particle size that is intended for disposal and that is: A manufactured object; or plant or animal matter; or natural geologic material. However, the following materials are not debris: any material for which a specific treatment standard is provided in Subpart D, Part 268, namely lead acid batteries, cadmium batteries, and radioactive lead solids; process residuals such as smelter slag and residues from the treatment of waste, wastewater, sludges, or air emission residues; and intact containers of hazardous waste that are not ruptured and that retain at least 75% of their original volume. A mixture of debris that has not been treated to the standards provided by §268.45 and other material is subject to regulation as debris if the mixture is comprised primarily of debris, by volume, based on visual inspection. [40 CFR §268.2(g)]

2.6.1 Dry Active Waste

Dry active waste is a subset of debris and consists of compactable trash, non-compactable trash, check sources, etc. Compactable and non-compactable trash are highly diverse waste streams and may include materials ranging from paper towels to contaminated metal components. Generally, compactable trash contains combustible material (e.g., paper, cloth, and plastic), whereas non-compactable trash contains metallic components and discarded equipment. Some trash also contains cellulose materials, which is subject to chemical attack by acids and oxidizers, and to degradation by bacterial action. Nuclear utilities frequently ship compactable and non-compactable trash in the same container, and frequently small pieces of metal are packaged with relatively innocuous materials. This practice is not as common among non-utility generators. These practices make independent characterization of these waste streams difficult. To help account for the non-homogeneity in waste packages generators and processors are required to minimize void spaces to the maximum extent practicable. [from TCEQ Publication SFR-104, page 57]

2.7 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.

2.8 Exempt Radioactive Material

Exempt radioactive material means radioactive materials meeting the specified criteria of 25 TAC §and/or 30 TAC, which are exempted from licensed radioactive materials regulations. If a radioactive material is exempted, it can be disposed of as if it was not a radioactive material. Despite its radioactive content, exempt materials do not need to be sent to a facility that is licensed for radioactive waste disposal [25 TAC §289.101(o)]. The disposal of exempt material as a radioactive substance is not subject to further regulation by the TCEQ, though the material is still regulated for other non-radioactive constituents. If it does not meet the exemption criteria, then it must be disposed of in the manner stipulated in 30 TAC §336.211, as appropriate to the type of licensed material. For purposes at WCS, exempt radioactive waste has the same meaning as exempt radioactive material. Exempt waste is specifically authorized for disposal in the Subtitle C Landfill.

2.9 Exemption Concurrence

A letter from the appropriate regulatory agency stating that a specific radioactive material or object meets the exemption criteria stipulated in the Texas Administrative Code and is therefore exempt from the radioactive materials regulations.

2.10 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 GTCC).

2.11 Fungible

Bulk shipments are considered fungible. Fungible loads consist of articles which are not distinguishable by a description referring to the particular item, but rather are distinguishable by the ascertainment of weight and measure. Examples: A rolloff of PCB soil is fungible as there is no difference between two different aliquots of waste, and the waste is measured by weight and volume. A liner of irradiated hardware is not fungible as it has a unique identification number and unique and specific contents, and the liner of irradiated hardware is also a nondivisible load. A shipment

of drums is not fungible as each drum can be individually counted and separated from the load, plus it can have a unique identification.

2.12 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.). Limitations by facility:

- Subtitle C Landfill – not applicable to bulk waste, and containers that may be crushed
- Subtitle C Landfill – minimum of 90% full, maximum 10% headspace for containerized waste that must be disposed intact due to health and safety concerns (e.g., drums of biological waste, beryllium, asbestos, etc.)

2.13 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 at 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.

2.14 Large Component (LC)

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

2.15 Licensed Radioactive Waste

Radioactive material received, possessed, used or transferred under a general or specific license issued by the agency [25 TAC §289.201(b)(53)]. Licensed radioactive waste has the same meaning as licensed radioactive material for the purposes of disposal.

2.16 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 TAC 336.362(b)(2) and conforms to the TCEQ regulatory requirements of retrievability. MCC are used at the CWF and FWF.

The MCC disposal structure provided by WCS will provide the stability required for radioactive waste in accordance with 10 CFR §61; therefore, the waste or the waste form as shipped to WCS is not required to meet stability requirements. All containerized High Class A, B, and C waste will be placed in an MCC.

Except for bulk waste in reusable containers and Large Components, waste packages must fit into a MCC. WCS 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

Note: Irradiated Hardware shipments that require transportation in the TN-RAM or 3-60B cask must be packaged in a liner that does not exceed an overall height of 107 inches and 34 inches in diameter.

2.17 Municipal Garbage

Solid waste consisting of putrescible animal and vegetable waste materials resulting from the handling, preparation, cooking and consumption of food, including waste materials from markets, storage facilities, handling, and sale of produce and other food products. [30 TAC §330.2(49)]

2.18 Nondivisible Load

A load that cannot be reduced to a smaller dimension without compromising the integrity of the load or requiring more than eight hours of work using appropriate equipment to dismantle. [43 TAC §28.2(38)]

2.19 PCB “incidental liquids”

PCB “incidental liquids” means PCB liquids at concentrations ≥ 50 parts per million (ppm) and < 500 ppm PCBs from incidental sources, such as precipitation, condensation, leachate or load separation and are associated with PCB Articles or non-liquid PCB wastes. [from 40 CFR §761.60(a)(3)]

2.20 Putrescible Wastes

Organic wastes, such as garbage, wastewater treatment plant sludge, and grease trap waste, that is capable of being decomposed by microorganisms with sufficient rapidity as to cause odors or gases or is capable of providing food for or attracting birds, animals, and disease vectors. [30 TAC §330.2(106)]

2.21 RCRA Empty

Containers that have held non-acute hazardous waste and did not contain a compressed gas are considered “RCRA empty” when:

- (i) All wastes have been removed that can be removed using the practices commonly employed to remove materials from the type of container, e.g., pouring, pumping, and aspirating, and
- (ii) No more than 2.5 centimeters (one inch) of residue remains on the bottom of the container or liner, or
- (iii)(A) No more than 3 percent by weight of the total capacity of the container remains in the container or inner liner if the container is less than or equal to 110 gallons in size, or
- (iii)(B) No more than 0.3 percent by weight of the total capacity of the container remains in the container or inner liner if the container is greater than 110 gallons in size. [from 40 CFR §261.7(b)(1)]

2.22 Small Generator

A generator of LLRW who generates no more than 100 cubic feet of such waste per year. Small quantity generator has the same meaning as small generator. This is not the same as the Small Quantity Generator definition under RCRA.

2.23 Small PCB Capacitor

A small capacitor is defined by TSCA as “a capacitor which contains less than 1.36 kg (3 pounds) of dielectric fluid. The following assumptions may be used if the actual weight of the dielectric fluid is unknown. A capacitor whose total volume is less than 1,639 cubic centimeters (100 cubic inches) may be considered to contain less than 1.36 kg (3 pounds) of dielectric fluid and a capacitor whose total volume is more than 3,278 cubic centimeters (200 cubic inches) must be considered to contain more than 1.36 kg (3 pounds) of dielectric fluid. A capacitor whose volume is between 1,639 and 3,278 cubic centimeters may be considered to contain less than 1.36 kg (3 pounds) of dielectric fluid if the total weight of the capacitor is less than 4.08 kg (9 pounds).”

2.24 Soil

Soil means unconsolidated earth material composing the superficial geologic strata (material overlying bedrock), consisting of clay, silt, sand, or gravel size particles as classified by the U.S. Natural Resources Conservation Service, or a mixture of such materials with liquids, sludges or solids which is inseparable by simple mechanical removal processes and is made up primarily of soil by volume based on visual inspection. Any deliberate mixing of prohibited hazardous waste with soil that changes its treatment classification (i.e., from waste to contaminated soil) is not allowed under the dilution prohibition in 40 CFR §268.3. [40 CFR §268.2(k)]

2.25 Soil-like Waste

Class A waste streams, with dose rate of less than 100 mR/hr at 30 centimeters, exhibiting acceptable levels of fine content, and plasticity characteristics as defined by Appendix 1 as determined by using ASTM D2487. Except as discussed below soil and soil-like waste with fine content greater than 35% and medium to high plasticity will not be considered bulk Soil-like Waste.

- Soil and soil-like waste having fine content greater than 35% and non-plastic to low plasticity shall be disposed of in combination with other acceptable soil and soil-like material as specified in the LLRW Waste Acceptance Plan.
- Soil and soil-like waste having fine content greater than 10% but less than or equal to 35% and medium to high plasticity shall be disposed of in combination with other acceptable soil and soil-like material as specified in

LLRW Waste Acceptance Plan.

- The average, in-place organic content of soil and soil-like waste does not exceed five percent (5%) and the average, as received organic content of any individual waste shipment does not exceed ten percent (10%) by using ASTM D-2974.

Bulk Soil-like wastes are comprised of a relatively homogeneous physical form that is amenable to collection of representative samples.

2.26 Solid Waste

A solid waste is any discarded material that is not excluded under 40 CFR §261.4(a) or that is not excluded by a variance granted under 40 CFR §260.30 and 40 CFR §260.31 or that is not excluded by a non-waste determination under 40 CFR §260.30 and 40 CFR §260.34. Excluded from the definition of solid waste are radioactive waste, radioactive waste with PCBs, and radioactive waste with asbestos. [see 40 CFR §261.2(a) for the complete definition]

Table 1 – Regulatory Combinations for Solid Waste Determination

Frequent Waste Characteristic Combinations	Waste Status	Common Documents
Industrial Hazardous Hazardous + PCB Regulated Hazardous + Asbestos Containing Material (ACM)/Regulated Asbestos Containing Material (RACM) PCB Regulated ACM / RACM Exempt Radioactive* Exempt Radioactive* + Industrial Exempt Radioactive* + Hazardous Exempt Radioactive* + PCB Regulated Exempt Radioactive* + ACM / RACM	Solid Waste	UHWL; LDR; ULLRWL is not required; PCB Continuation form; Asbestos Record of Shipment
Licensed Radioactive + Hazardous Licensed Radioactive + Hazardous + PCB Regulated Licensed Radioactive + Hazardous + ACM / RACM	Solid Waste	ULLRWL; UHWL; LDR; PCB continuation form; Asbestos Record of Shipment
Licensed Radioactive Licensed Radioactive + PCB Regulated Licensed Radioactive + ACM / RACM	Not solid waste	ULLRWL; UHWL; PCB continuation form; Asbestos Record of Shipment

*In this table, “Exempt Radioactive” includes Radioactive Material both Exempt by Rule and Exempt by WCS LC 192 in accordance with Section 7.0 of this handbook.

2.27 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 of uranium, thorium, or any combination thereof. Source material does not include special nuclear material.

2.28 Special Nuclear Material (SNM)

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

2.29 Sum-of-Fractions Rule

Equation used to determine if a mixture of radionuclides exceeds a limit when each radionuclide has a different activity limit. The rule is shown as the below equation, but can be described as the requirement that the sum of the ratios of the radionuclide concentrations over its regulatory limit is less than or equal to one.

$$Ratio = \sum_{i=1}^N \frac{C_i}{R_i} \leq 1.0$$

C is the measured concentration or activity of radioisotope i .

R is the limit for the concentration or activity of radioisotope i

N is the total number of radioisotopes in the waste.

2.30 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.).

- Subtitle C Landfill – not applicable to bulk waste, and containers that may be crushed
- Subtitle C Landfill – minimum of 90% full, maximum 10% void space for containerized waste that must be disposed intact due to health and safety concerns (e.g., drums of biological waste, beryllium, asbestos, etc.)

3.0 TEXAS STATE NOTIFICATION REQUIREMENTS (FOR INDUSTRIAL NON-HAZARDOUS AND HAZARDOUS WASTE)

The State of Texas has notification requirements for industrial generators of both non-hazardous and hazardous waste. Notification requirements typically pertain to in-state generators that generate greater than 100 kilograms of Class 1 waste in any calendar month, or exceed the Conditionally Exempt Small Quantity Generator (CESQG) status for hazardous waste. Generators that fall into the above categories must register with the State of Texas per 30 TAC §335.6(c).

Out-of-state generators do not have to register with the state, unless the generator wants to classify a waste stream as Class 2 or Class 3 waste. Solid wastes from unregistered out-of-state generators are automatically Class 1 waste. Though out-of-state generators are not required to register with the state, each state has been assigned a generic identification number available in TCEQ Publication RG-022, *Guidelines for the Classification and Coding of Industrial and Hazardous Wastes*.

3.1 Non-Hazardous Industrial Waste as Defined by the Texas Administrative Code (TAC)

The State of Texas regulates non-hazardous industrial waste by using three classifications, Class 1, Class 2, and Class 3. Guidance for classification of waste in the State of Texas is located in 30 TAC §335, Subchapter R and in TCEQ Publication RG-022, *Guidelines for the Classification and Coding of Industrial and Hazardous Wastes*. WCS is permitted by TCEQ to treat, store, and dispose of all three classes of waste in the Subtitle C Landfill with certain restrictions described in the subsections of Section 1.9.

3.2 8-Character Texas Waste Code

All solid wastes received by WCS for storage, processing, and/or disposal is required to have an 8-character Texas waste code associated with it. If the waste is generated in the state of Texas and the generator is required to register with the state, the waste stream must also be registered with the state of Texas. For waste generated outside of Texas, please contact WCS for assistance in determining the 8-character Texas waste code. Refer to Section 11.1.4.2 for entry on EPA Form 8700-22 [Uniform Hazardous Waste Manifest (UHW)].

NOTE:

The combinations of radioactive waste and asbestos and radioactive waste and PCBs are not solid wastes, and do not require an 8-character Texas Waste Code. However, TSCA rules call for the use of UHWM for PCB wastes.

Mixed waste, mixed waste with PCBs and mixed waste with asbestos are solid wastes and require an 8-character Texas Waste Code and the use of a UHWM.

4.0 10 CFR § 37.71 ADDITIONAL REQUIREMENTS FOR TRANSFER OF CATEGORY 1 AND CATEGORY 2 QUANTITIES OF RADIOACTIVE MATERIAL

10 CFR § 37.71 requires any licensee transferring category 1 and 2 quantities of radioactive material to a licensee of the Commission or an Agreement State, prior to conducting such transfer, shall verify with the NRC's license verification system (LVS) or the license issuing authority that the transferee's license authorizes the receipt of the type, form and quantity of radioactive material to be transferred and that the licensee is authorized to receive radioactive material at the location requested for delivery.

Texas is an Agreement State, and verifications can be completed through the NRC's LVS. The LVS website is <http://www.nrc.gov/security/byproduct/ismplvs.html>. Contact the LVS Help Desk by phone at 1-877-671-6787 or by email at LVSHelp.Resource@nrc.gov.

TCEQ maintains a website with WCS RML #R04100 PDFs and revision information at http://www.tceq.texas.gov/permitting/radmat/licensing/wcs_license_app.html

WCS maintains a website with all licenses and permits at <http://www.wcstexas.com/facilities/licenses-permits/>

5.0 WASTE PROFILES AND WASTE CLASSIFICATION

The first step in the waste acceptance process is the completion of a WCS Profile. WCS Form WA-1.0-1, *Waste Profile Sheet* must be completed for each authorized waste stream or appropriate combination of authorized waste streams that a generator intends to ship to the TSDF for disposal, treatment, processing or storage. It is the generator's responsibility to ensure waste is classified and characterized correctly through process knowledge and/or analytical data. Regulatory guidance is in 40 CFR §262.11. WCS may advise customers in this process; however, the generator must ultimately inform WCS of the regulatory status and waste classification for each waste stream.

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. The completed profile form provides an overview of the waste stream and its physical, chemical and radiological characteristics.

5.1 Submitting a WCS Profile for Approval in ELITE

Any section not applicable on WCS Form WA-1.0-1, *Waste Profile Sheet* 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.

Additional documentation and/or sampling requirements may differ depending upon the regulatory status of each waste stream. The following guidelines describe the general categories and the required information for each category.

The TSDF and the LLRW disposal facilities have separate SNM requirements. It is possible that wastes acceptable for LLRW disposal cannot be stored or treated at the TSDF.

WCS reserves the right to require samples and/or additional documentation in conjunction with the general waste stream categories listed in the below subsections.

5.2 Waste Profile Recertification

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.

5.3 Radionuclides

The following radionuclides are required to be placed on WCS Form WA-1.0-1, *Waste Profile Sheet*, 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 CFR §173.433(c)(2)
- Radionuclides that affect the dose rate of a package or shipment
- Uranium and/or thorium considered source material
- As required under WCS RML R4100 license condition 192, if applicable

In addition, the subsequent shipping documentation must include only radionuclides that were previously identified on the approved waste profile. Consequently generators should consult NUREG/BR-0204 for guidance on other radionuclides that should be identified on the waste profile (e.g. hard-to-detect isotopes below the limits of detection).

If the total activity for uranium (U-Nat or U-Dep) or non-enriched thorium (Th-Nat) is less than one curie, then the isotopes can be identified as Th-Nat, U-Nat or U-Dep as appropriate on the profile and manifests. If the total activity for any of the three (Th-Nat, U-Nat or U-Dep) is greater than one curie then the isotopes are required to be broken down to the specific isotopes by the generator in the profile and manifest.

NOTE:

When profiling the maximum concentration and profile lifetime activity of each isotope, do not use the exact values on manifests, or round values down from manifested values. Generators are encouraged to round all values up as manifest concentrations and total activity must be less than the profiled values. Some generators prefer to list values up to 10% greater than anticipated. Variations in the number of significant digits between the profile and manifest can also create issues during shipment review.

Example: Profiled maximum concentration of H-3 is 1.23E+03 pCi/g with a manifested H-3 concentration of 1.2345E+03 pCi/g is unacceptable. An acceptable profile maximum concentration would be 1.24E+03 pCi/g or greater.

Isotopes that will be within parentheses on the manifest to identify them as Lower Limit of Detection (LLD) values that are not present in the waste should be included on the profile form with placeholder concentrations and activity.

5.3.1 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.

5.4 Waste Class

NOTE:

Radium-226 is a waste class driver in Texas and must be considered in waste class calculations.

The generator's waste profile and supporting documentation, must demonstrate reasonable assurance that the waste is correctly classified as Class A(U), A(S), B, C, or GTCC in accordance with the waste classification tables in 30 TAC §336.362, Appendix E, as summarized in the Waste Classification Tables 1 and 2 below; 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.

Table 2 – 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/m ³	¹	Ci/m ³	8	Ci/m ³
C-14 in Activated Metals	8	Ci/m ³	¹	Ci/m ³	80	Ci/m ³
Ni-59 in Activated Metals	22	Ci/m ³	¹	Ci/m ³	220	Ci/m ³
Nb-94 in Activated Metals	0.02	Ci/m ³	¹	Ci/m ³	0.2	Ci/m ³
Tc-99	0.3	Ci/m ³	¹	Ci/m ³	3	Ci/m ³
I-129	0.008	Ci/m ³	¹	Ci/m ³	0.08	Ci/m ³
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

¹There 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 3 – 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/m ³	³	Ci/m ³	3	Ci/m ³
H-3	40	Ci/m ³	³	Ci/m ³	3	Ci/m ³
Co-60	700	Ci/m ³	³	Ci/m ³	3	Ci/m ³
Ni-63	3.5	Ci/m ³	70	Ci/m ³	700	Ci/m ³
Ni-63 in Activated Metals	35	Ci/m ³	700	Ci/m ³	7,000	Ci/m ³
Sr-90	0.04	Ci/m ³	150	Ci/m ³	7,000	Ci/m ³
Cs-137	1	Ci/m ³	44	Ci/m ³	4,600	Ci/m ³

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.

For the purpose of CWF and FWF disposal, WCS is authorized to accept for storage at the Storage and Processing Facility, waste which is handled, treated, packaged, or characterized in accordance with applicable requirements. Waste class applies when the waste is manifested for transport, regardless if a waste class has been assigned on the manifest documents. NRC waste classification shall apply and shall be limited to Class A, B, and C.

5.5 Analytical Data and NELAC Accreditation

Analytical data and/or documentation of process knowledge are 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.

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 (i.e., the laboratory is NELAC-accredited by another state for Safe Drinking Water Act analyses). TCEQ has interpreted “accredited under federal law” to include DOE on-site labs that are subject to DOECAP audits as labs that are operating under federal law.
- 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.

5.6 Generator Knowledge and Process Knowledge

The generator may use process knowledge to characterize waste 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. 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 will 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.

Process knowledge cannot be used in place of the minimum required sampling for radioactive exemption under RML 4100 LC 192 (See Section 7.0 of this handbook).

5.7 Pre-Acceptance Sampling and Analysis Supporting Profile Approval

NOTE:

Do not ship samples without written request and direction from WCS.

Generators will be notified as part of the waste profile approval process if pre-shipment waste samples are required. All pre-shipment samples must be pre-authorized and sent to the following address via Fed Ex, UPS or Courier in compliance with all applicable 49 CFR and International Air Transportation Association (IATA) *Dangerous Goods Regulations*. The shipment must include WCS Form AL-2.1.1-2, *Chain of Custody Record for Samples for Pre-Acceptance Samples*. **Do not ship samples via US Postal Service.** WCS receives FedEx and UPS deliveries once per day in the afternoon, and Saturday delivery is not available in this region.

Table 4 – Laboratory Manager Shipping Address Information

FedEx	Courier or UPS
Laboratory Manager Waste Control Specialists LLC 9998 W State Hwy 176 Eunice, NM 88231 (888) 789-2783	Laboratory Manager Waste Control Specialists LLC 9998 W State Hwy 176 Andrews, TX 79714 (888) 789-2783

Pre-shipment samples with licensed radioactive material and/or SNM cannot ship to WCS until after the profile is approved. SNM wastes must meet the sampling and analysis requirements of OP-1.2.22, *SNM Exemption*, prior to receipt by WCS.

WCS does not generally require generators to send pre-shipment samples for the following waste streams, but may request them on a case-by-case basis:

- Waste that could release radon or tritium gas upon opening
- Waste that could release fine, dispersible radioactive particulates upon opening (e.g., ash)
- Biological waste
- Waste with sharps from any source
- Lab-pack or combination packaging as defined by 49 CFR §171.8
- Commercial products or chemicals: off-specification, outdated, unused, contaminated or banned. This includes products voluntarily removed from the marketplace by a manufacturer or distributor
- Residue and debris from the cleanup of spills or releases of a single chemical substance or commercial products, or a single waste which would otherwise qualify for an exception
- Chemical-containing equipment removed from service visually identifiable through inspection, where information regarding its former service is adequate for same management (e.g., commercial products, smoke detectors, optical lenses, filter cartridges, etc.)
- Demolition wastes produced from the demolition or dismantling of industrial process equipment or facilities contaminated with chemical from the process. Knowledge of the process and chemicals used in the process allows characterization of the waste sufficient for safe management
- Articles, debris, non-RCRA hazardous wastes, equipment and clothing containing or contaminated with PCBs. This includes PCB capacitors, transformers, gloves or aprons from draining operations, empty drums that formerly held PCBs, etc.
- PCB drainings from PCB articles, PCB articles that have been flushed with a clean solvent in accordance with 40 CFR §761, and resultant liquid flushing residuals. For flushing residuals, the generator will provide WCS with the identity of the solvent used under 40 CFR §761
- WCS site-generated waste, including hazardous and non-hazardous wastes. The WCS facility generating the waste is required to submit the analytical data and/or information required by 40 CFR §264.13(a)(1) [as outlined in 40 CFR §264.13(a)(2) and comment] generally through a waste profile.
- Household hazardous waste, pesticide “Clean Sweep” waste, waste from small quantity generators and/or small volume waste streams (<25 tons per year). For these exceptions, the generator will supply WCS with sufficient chemical and physical characteristic information for proper management of the waste.
- Controlled substances regulated by government agencies including drugs and/or materials from clandestine laboratories. This includes illicit drugs and associated production equipment confiscated by the Drug Enforcement Agency (DEA), state and local police, or other state and federal law enforcement agencies, and outdated or off-specification pharmaceuticals that are regulated as controlled substances.
- Wastes from remedial projects in which the waste characterization is known through a sampling and analysis plan approved by a federal or state agency (e.g., CERCLA, or Potentially Responsible Party-type project) or other well developed plan containing sufficient analytical data and QA/QC data to provide for proper management of the wastes.
- Debris as defined in 40 CFR §268.2. These materials will be visually inspected prior to acceptance in order to ensure the waste meets the definition of debris. Any waste stream that does not consist primarily of debris by volume [per 40 CFR §268.2(g)] does not qualify for this exemption.
- Aerosol cans

- Vitrified, cemented or other materials exhibiting high structural integrity are exempted. There are several materials which are not conducive to sampling which must be recognized. Structural settle, tanks, pipe, metal sheeting and parts, wire or tubing, cement, glass, empty drums, machinery, equipment, manufactured items, monolithic/cemented materials and several other materials are managed which do not allow for normal sampling protocols. By necessity, these materials must be managed on a case-by-case basis. In some cases, a clean-up agency (e.g., EPA, TCEQ, etc.), generator, or contractor has established a rational basis of data and waste characterization information. In those cases, this information may be used in lieu of pre-acceptance analytical information.

NOTE:

Waste that is subject to the Land Disposal Restrictions and either meet the disposal criteria without additional treatment or were treated elsewhere to meet the LDRs are not subject to this exemption.

5.8 Waste Packaging

Generators should identify every type and size of waste container that will be used for each waste profile. If a shipment request or draft manifest cites a container not part of profile, a profile revision may be required. WCS will request generators provide drawings, dimensions and tare weights for containers new to WCS, along with container closure instructions, as needed. All waste shipped to WCS must be able to be removed from the delivering conveyance in a DOT-compliant package.

5.9 Special Handling Requirements

Generators must identify special handling requirements in writing during the profiling process. This includes identification of proprietary tools required to open containers, providing data and/or schematics to support critical crane lift calculations or requirements for uncommon material handling equipment.

5.10 Use of Shielded Shipping Casks

Include all cask models and cask loading configuration information in the waste profile. Specifically identify if the liner/container(s) 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.

5.10.1 Liners in Lift Bags

WCS requests attachment of 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 using 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.

5.10.2 Grappable Liners

WCS can offload 6-80 and 8-120 poly or carbon steel liners with an installed grapple bail. WCS does not require cribbing underneath 6-80 liners shipped in 8-120A or 8-120B casks. WCS' grapple can retrieve 6-80 liners from the bottom of 8-120A or 8-120B casks.

5.10.3 Liners with Slings

WCS can offload any liner that is loaded into a cask (any Type A, 8-120B or 10-160B casks) 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.

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 plastic 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 during the profiling process.

5.10.4 Irradiated Hardware Casks and Liners

TN-RAM and 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 or FWF, the irradiated hardware liner must not exceed an overall height of 107 inches and 34 inches in diameter.

5.10.5 Other Configurations in Shielded Shipping Casks

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

5.10.6 Type B Cask Authorized User Information

WCS is an NRC authorized user of the following Type B casks:

- 8-120B (certificate of compliance 9168)
- 10-160B (certificate of compliance 9204)
- HalfPACT (certificate of compliance 9279)
- RT-100 (certificate of compliance 9365)
- TN-RAM (certificate of compliance 9233)
- 3-60B (certificate of compliance 9321)
- TRUPACT II (certificate of compliance 9218)
- TRUPACT III (certificate of compliance 9305)

WCS will become an authorized user of other Type B casks upon request. Type A casks do not require prior user authorization by NRC or DOE.

6.0 ACCEPTABLE WASTE STREAMS

WCS is able to accept, manage, treat and dispose a broad variety of waste streams with multiple regulatory considerations. In general, profiles should be limited to a unique combination of waste characteristics representing one selection per column in the below table. It is acceptable to have multiple profiles for a unique combination of waste characteristics, also. Friable and non-friable asbestos can be profiled together as ACM.

Table 5 – Acceptable Waste Profile Regulatory Combinations

A Waste Profile Should Reflect One (1) Selection per Column at the Time of Receipt			
Rows are not considered while using this Table			
Radiological Regulatory Status	PCB Regulatory Status	RCRA Regulatory Status	Asbestos Regulatory Status
Non-radiological Waste	Unregulated Waste	Unregulated Waste	Unregulated Waste
Exempt Radioactive Waste (Exempt by Rule)	TSCA Regulated Waste PCB >50 ppm	RCRA Exempt Waste	Asbestos Containing Material
Licensed Radioactive Waste (Exempt by LC 192)		Hazardous Waste Not Soil or Debris	
Licensed Radioactive Waste		Hazardous Soil	
		Hazardous Debris	

6.1 Non-Hazardous, Non-TSCA, Non-Radioactive Industrial Wastes

Wastes are expected to be ready for disposal in the Subtitle C Landfill upon receipt. Wastes are Texas Class 1, 2 or 3 Industrial Solid Wastes.

Wastes with planned disposal in the Subtitle C Landfill or treatment in the Stabilization Building containing total beryllium greater than 1500 ppm (0.15% by weight) in solid form are managed on a case-by-case basis.

6.2 Acceptable Preparation of Biological, Pathogenic or Infectious Waste

Biological, pathogenic or infectious LLRW waste (biological waste) must be treated and correctly packaged to reduce to the maximum extent practicable the potential hazard from the non-radiological materials prior to shipment to WCS. Incineration is the preferred method of treatment for biological, pathogenic or infectious LLRW waste. WCS is not permitted to store or dispose of non-radioactive biological, pathogenic or infectious waste.

NOTE:

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 and described below. Refer to *Appendix 1 – Hazardous, Biological, Pathogenic, or Infectious Waste Packaging* for an illustration.

- 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 Asbestos Containing Material as Defined by 40 CFR §61, Subpart M, and TSCA in 40 CFR §763

WCS is approved to store, process, and dispose of regulated (friable) asbestos containing material (ACM) as defined by 30 TAC §Section 330.2 and non-regulated (non-friable) asbestos containing material (ACM) without licensed radioactive material, provided that waste stream meets all the other requirements of this document.

WCS is approved to store and process ACM as defined by 30 TAC §Section 330.2 and non-regulated (non-friable) ACM with licensed radioactive material, provided that waste stream meets all the other requirements of this document. Radioactive waste planned for ultimate disposal in the By-product Facility, CWF or FWF are required to meet the standards of the governing documents for each facility, which is outside the scope of this document.

All ACM that is friable or otherwise capable of giving off asbestos dust must be wetted with a water and surfactant mix and stored in two plastic bags whose combined thickness equals at least 6 mil. The plastic bags must be overpacked in leak-resistant containers that meet applicable shipping requirements for the radioactive content of the material involved, if applicable. Sharp edges and corners within the package shall be padded or otherwise protected to prevent damage to the inner plastic during handling and shipping. Since the asbestos must be wetted during abatement activities, an absorbent must be added to ensure compliance with the free liquid criteria for interim storage of licensed radioactive material.

All RACM shall be packaged, marked, and labeled in accordance with the requirements of 40 CFR §61.150.

There are special precautions that must be taken when processing RCRA hazardous waste and LLMW that contains asbestos; therefore, WCS may require additional notification time in addition to the standard requirements dictated in this document to receive and/or process this waste.

6.4 Licensed Low Level Radioactive/Mixed Waste (LLRW/LLMW)

WCS is licensed by the TCEQ to receive, store and process LLRW that meets the following definition:

“Any radioactive material (includes radioactive waste, byproduct material as defined by the Texas Health and Safety Code paragraph 401.003(3)(B), uranium ore received as waste, NORM waste, and oil and gas NORM waste.”

This category can be liquid, gas, or solid, though compressed gases are not allowed. The TCEQ has separated radioactive isotopes into four (4) category groups in 30 TAC §336.1207(a) with Curie (Ci) limits shown in *Appendix 5 – Radioactive Substances Processing and Storage Categories of Radionuclides*. WCS is limited to the following maximum activities:

- Category I: 2,000 Ci (33,000 Ci if the waste is associated with an AFA agreement as described below)
- Category II: 20,000 Ci
- Category III: 200,000 Ci
- Category IV: 2,000,000 Ci

This definition includes waste classified as Class A(U), A(S), B, C, and GTCC. Waste must be classified using 30 TAC §336.362 Appendix E “Classification and Characteristics of Low-Level Radioactive Waste.” Radium-226 is a waste class driver in Texas and must be included in waste class calculations.

WCS can also accept transuranic (TRU) waste for processing and/or storage within the limits of RML R04100. Prior to receipt of TRU waste with concentrations exceeding 100 nanocuries per gram (nCi/g), an executed, written agreement between an authorized federal agency (AFA) and WCS must be obtained for that customer’s waste. WCS shall assist the customer in obtaining such an agreement, and the agreement shall meet the terms specified in RML R04100, LC 206.C. Refer to OP-1.2.22, *SNM Exemption*.

WCS is licensed by the TCEQ to receive sealed sources for interim storage that do not have a total activity exceeding 150,000 Ci.

NOTE:

Waste received for storage and processing does not require importation approval from the TLLRWCC.

All radioactive waste shipped to the WCS facility shall have its radioactivity content determined prior to shipment. The concentration of each radionuclide shall be determined from nuclear assay, direct measurement, process knowledge, or any other approved method. Refer to *Low-Level Waste Licensing Branch Technical Position on Radioactive Waste Classification* (NRC, 1983) and *Branch Technical Position on Concentration Averaging and Encapsulation* (NRC, 1995). This information is required to maintain WCS facility radioactive material inventory levels within RML R04100 limits issued by TCEQ.

The concentration of a radionuclide may be determined by indirect methods such as use of scaling factors, which relate the inferred concentration of one radionuclide to another that is measured, or radionuclide material accountability, if there is reasonable assurance that the indirect methods can be correlated with actual measurements. The concentration of a radionuclide may be averaged over the volume of the waste or weight of the waste if the units are expressed as picocuries per gram (pCi/g).

Radioactive waste planned for ultimate disposal in the By-product Facility, CWF or FWF are required to meet the standards of the governing documents for each facility, which is outside the scope of this document.

6.4.1 Beryllium without Special Nuclear Material (SNM)

Containerized and sealed licensed radioactive wastes not containing SNM may contain total quantities of beryllium greater than 1000 ppm (0.1 wt %) in solid form. Wastes are managed on a case-by-case basis.

6.4.2 Special Nuclear Material (SNM)

WCS is licensed by the TCEQ to receive, store and process SNM at the Storage and Processing Facility provided that “Concentrations of SNM in individual waste containers and/or during processing must not exceed the following values:”

Table 6 – LC 206.A.1 Special Nuclear Material Concentration Limits

SNM Isotope ^{1,4}	Maximum Concentration (g SNM/g waste)	Maximum Concentration (pCi/g)	Measurement Uncertainty (gram SNM/gram waste) Maximum one sigma
U-233	4.7E-04	4.5E+06	7.1E-05
U-235 ²	9.9E-04	2.1E+03 (U-235)	1.5E-04
U-235 ³	6.2E-04	1.3E+03 (U-235)	9.3E-05
Pu-239	2.8E-04	1.7E+07	4.2E-05
Pu-241	2.2E-04	2.3E+10	3.2E-05

¹ Isotopes of uranium and plutonium not listed can be received in any concentration.

² Less than 10 percent enrichment (U-235 mass enrichment)

³ Greater than 10 percent enrichment (U-235 mass enrichment)

⁴ For a mixture of SNM isotopes listed in this table, the sum-of-the-fractions rule applies.

The SNM must be uniformly distributed throughout the waste, such that the limiting concentrations must not be exceeded on average in any contiguous mass of 600 kg.

The mass concentrations of carbon (C), fluorine (F) and bismuth (Bi) in the waste must be limited as in the table below. For waste containing mixtures of C, F, and Bi, the sum of the weight fractions of C, F, and Bi shall be compared to the most restrictive maximum allowable weight fractions for any one of those elements. Similarly, where mixtures of radionuclides are present in the waste, the limiting maximum allowable weight fraction of C, F, and Bi shall be applied. The presence of the above materials will be determined and documented by the generator, based on process knowledge or testing.

Table 7 – LC 206.A.2 Carbon, Fluorine and Bismuth Mass Concentration Weight Percent Limits

SNM Isotope	Carbon	Fluorine	Bismuth
U-233	28 wt %	34 wt %	34 wt %
U-235 ¹	25 wt%	35 wt %	31 wt %
U-235 ²	41 wt%	42 wt %	33 wt %
Pu-239	43 wt%	43 wt %	34 wt %
Pu-241	37 wt%	39 wt %	32 wt %

¹ Less than 10 percent enrichment (U-235 mass enrichment)

² Greater than 10 percent enrichment (U-235 mass enrichment)

NOTE:

The intent of LC 206.A.2 is to limit the availability of three specific elements as neutron moderators. Therefore, the concentrations of carbon in the NRC Order (Docket No. 70-7005), dated October 26, 2009, are understood to refer to “pure carbon” or “free carbon atoms” in the waste matrix. When LC 206.A.2 refers to a restriction on ‘elemental carbon’, it refers to carbon in its various carbon-only molecular forms (e.g., graphite). This does not include carbon in polymeric chains or other molecules (e.g., plywood), because molecularly-bound carbon atoms are ineffective as moderators. The same holds for fluorine and bismuth.

Waste accepted shall not contain total quantities of beryllium, hydrogenous material enriched in deuterium or graphite above one tenth of one percent (0.1 wt %) of the total weight of the waste. The presence of the above materials will be determined and documented by the generator, based on process knowledge, or testing.

Possession of highly water soluble forms of SNM shall not exceed the amount of SNM of low strategic significance defined in 10 CFR §73.2. Highly soluble forms of SNM include, but are not limited to: uranium sulfate, uranyl acetate, uranyl chloride, uranyl formate, uranyl fluoride, uranyl nitrate, uranyl potassium carbonate, uranyl sulfate, plutonium

chloride, plutonium fluoride, and plutonium nitrate. The presence of the above materials will be determined and documented by the generator, based on process knowledge or testing.

The Storage and Processing Facility and the LLRW disposal facilities (CWF and FWF) have separate SNM requirements. The Storage and Processing Facility SNM limits are concentration based, while the CWF and FWF are under gram limits. It is possible that wastes acceptable for LLRW disposal cannot be stored or treated at the Storage and Processing Facility.

There are several other requirements for SNM material that must be met prior to acceptance. See WCS Procedure OP-1.2.22 *SNM Exemption* regarding receipt of SNM material.

6.4.3 Storage Restrictions of LLMW

WCS may store unprocessed LLMW up to 365 days with two exceptions:

- Waste that cannot be processed into a form that has a current disposal option must be shipped off-site within 180 days from the date it is determined that the waste cannot be treated by WCS to meet a current disposal facility requirements.
- LLMW Waste being treated under a RCRA treatability study is subject to the time constraints set forth by RCRA.

6.4.4 Storage and/or Processing LLRW prior to CWF Disposal

Generators are directed not to commingle LLRW wastes from Texas and Vermont in the same container and to not commingle Texas or Vermont waste with waste from other states into a single waste container. WCS will not intentionally commingle Texas or Vermont waste with waste from other states. Importation approval through the Texas Low-Level Radioactive Waste Disposal Compact Commission (TLLRWDC) is not required for receipt or storage of waste.

6.4.5 Storage and/or Processing LLRW prior to FWF Disposal

TLLRWDC does not have oversight of LLRW or MLLW intended for the FWF.

6.5 Polychlorinated Biphenyl (PCB) Waste as Defined by the Toxic Substances Control Act (TSCA) (40 CFR §761)

6.5.1 PCB Waste (non-hazardous non-radioactive waste)

The following non-radioactive PCB materials can be received, stored, processed and/or disposed at WCS:

NOTE:

TSCA does not allow the solidification of PCB liquids in order to circumvent any incineration requirements the liquids would normally be subject to.

6.5.1.1 PCB Soil

WCS is authorized by TSCA to accept PCB soils for storage and disposal regardless of concentration. TSCA does not require this material to be treated prior to disposal; however, if there are sorbents added to bulk shipments of a waste stream, WCS must treat the waste prior to disposal. If the waste is shipped in containers less than 110 gallons, WCS can dispose of waste containing non-biodegradable sorbents without treatment, but must treat biodegradable sorbents prior to disposal.

6.5.1.2 PCB Solids

WCS is authorized by TSCA to accept PCB solids for storage and disposal regardless of concentration. TSCA does not require this material to be treated prior to disposing of this material; however, if there are sorbents added to bulk shipments of a waste stream, WCS must treat the waste prior to disposal. If the waste is shipped in containers less than 110 gallons, WCS can dispose of waste containing non-biodegradable sorbents without treatment, but must treat biodegradable sorbents prior to disposal.

6.5.1.3 PCB Transformers

WCS is authorized by TSCA to accept PCB transformers for storage, processing and subsequent disposal of the transformer carcass. WCS is authorized to drain and flush transformers according to 40 CFR §761.60 (b)(1)(i)(B), and/or 40 CFR §761.79. The drained PCB oil and rinsate must be sent to a TSDF with an approved technology to dispose of liquid PCB waste. Though WCS does offer this service, it is done on a limited basis.

6.5.1.4 PCB Fluorescent Light Ballasts

WCS is authorized by TSCA to store and dispose of PCB fluorescent light ballasts according to 40 CFR §761.60(b)(6)(iii).

6.5.1.5 Small PCB Capacitors

WCS is authorized by TSCA to accept PCB small capacitors for storage and disposal according to 40 CFR §761.60 (b)(2)(ii) unless the generator is subject to the requirements of 40 CFR §761.60 (b)(2)(iv).

6.5.1.6 Large PCB Capacitors – Storage Only

WCS is authorized by TSCA to accept PCB large capacitors for storage only. Large capacitors must be disposed of in a TSCA authorized incinerator as required by 40 CFR §761.60 (b)(2)(iii). WCS is not currently accepting this type of material for storage. Contact Customer Service at (888) 789-2783 for assistance.

6.5.1.7 PCB Liquids – Storage Only

WCS is authorized by TSCA to accept PCB liquids for storage only. As WCS does not possess an approved technology for the treatment/destruction of liquid PCB waste, each waste stream is be evaluated for acceptance on case-by-case basis.

NOTE:

“Incidental liquids” are defined by TSCA as liquids associated with PCB Articles or non-liquid PCB waste from incidental sources, such as precipitation, condensation, leachate, or load separation.

If the waste is between 50 and 500 ppm, and contains liquid that meets the definition of “incidental liquids” as defined by TSCA and in Section 2.1820, WCS may solidify those liquids and dispose of the material. The generator must supply WCS with information that shows that the liquids do not exceed 500 ppm PCB and are not an ignitable waste as described in 40 CFR §761.75(b)(8)(iii).

6.5.2 PCB/RCRA Waste (hazardous non-radioactive waste)

6.5.2.1 PCB/RCRA Soil

Waste that is classified as a RCRA hazardous waste and regulated by TSCA as PCB waste must be treated to meet both TSCA and RCRA treatment requirements. Though TSCA does not require non-liquid PCB waste to be treated; RCRA considers PCBs as an Underlying Hazardous Constituent (UHC), and the waste must be treated to meet Universal Treatment Standards (UTS) prior to disposal. WCS may not treat, under any circumstance, hazardous waste with PCB concentrations equal to or greater than 1,000 ppm. Hazardous waste with PCB concentrations less than 1000 ppm are be evaluated on case-by-case basis for treatment. WCS is authorized to store, process and dispose of RCRA/PCB waste that is defined as “soil” in 40 CFR §268.2 (k) providing the RCRA waste codes and constituents are within the permit restrictions and guidelines for hazardous waste as discussed in this document.

PCBs found in soils that are characteristic for metals only (D004-D011) do not require treatment to meet UTS per 40 CFR §268.49(d) if the total concentration of PCBs is less than 1,000 ppm per 40 CFR §268.32. The metals must be treated to meet the standards in 40 CFR §268.49.

RCRA/PCB soils with any waste codes other than D004-D011 require treatment per 40 CFR §268.49 of all RCRA regulated constituents, including PCBs, which are present in the waste stream. WCS reserves the right to deny waste for treatment though it meets all of WCS’ licenses, permits, and other requirements.

6.5.2.2 PCB/RCRA Solids

WCS is authorized to store, process and dispose RCRA/PCB non-liquid waste providing the RCRA waste codes and constituents are within the permit restrictions and guidelines for hazardous waste as discussed in this document. PCBs

are considered a UHC under RCRA as defined in 40 CFR §268.2(i) and 40 CFR §268.48, and must be treated to meet UTS. WCS reserves the right to deny waste for treatment though it meets all of WCS' licenses, permits, and other requirements. WCS is authorized to store and process RCRA/PCB waste classified as debris that is subject to the alternate treatment standards in 40 CFR §268.45. Transformers, capacitors and any other man-made objects that have special disposal requirements under TSCA 40 CFR §761.60 must be treated to those standards prior to applying a specified technology under the alternate treatment standards for debris. All debris for treatment must meet the size and weight limits found in Section 1.3.1.

6.5.2.3 PCB/RCRA Liquids – Storage Only

WCS is authorized to accept RCRA/PCB liquids for storage. As WCS does not possess an approved technology for the treatment/destruction of RCRA/PCB liquids, each waste stream is be evaluated for acceptance on case-by-case basis.

If the waste is between 50 and 500 ppm, and contains liquid that meets the definition of “incidental liquids” as defined by TSCA and in Section 2.18, WCS may solidify those liquids, treat the RCRA constituents if they are within the permit restrictions and guidelines for hazardous waste as discussed in this document, and dispose of the material. The generator must supply WCS with information that shows that the liquids do not exceed 500 ppm PCB and are not an ignitable waste as described in 40 CFR §761.75(b)(8)(iii).

6.5.3 PCB/Low-Level Radioactive Waste (licensed radioactive waste)

6.5.3.1 PCB/LLRW Soil

WCS is authorized to accept this material for storage only unless it can be managed in accordance with Section 7.0 of this handbook.

6.5.3.2 PCB/LLRW Transformers

WCS may process transformers that have external radioactive contamination and contain oil that is greater than 50 ppm PCB, provided the following applies:

- The oil must NOT be contaminated with radioactivity or the generator must agree to accept the oil and any flushing or rinsate liquids generated by WCS back within 60 days of generation. Any oil not contaminated with radioactivity is sent to a TSCA-authorized incinerator for destruction.
- If the transformer is shipped to WCS for disposal in the TSDF RCRA/TSCA landfill, it must come in meeting the requirements found in Section 7.0 of this handbook or WCS must be able to decontaminate the transformer to meet the acceptable surface contamination levels from 30 TAC §336.364 Appendix G, listed in Section 8.2 at the time of disposal. Transformers that are also considered Federal Facility Waste that cannot meet this requirement may be disposed in the FWF once they have been drained and flushed as required.

6.5.3.3 PCB/LLRW Solids

WCS is authorized to accept this material for storage only unless it can be managed in accordance with Section 7.0 of this handbook. All material received by WCS for storage must be removed from the WCS facility within one year.

Radioactive waste with planned for ultimate disposal in the CWF or FWF are required to meet the standards of the governing documents for each facility, which is outside the scope of this document.

6.5.3.4 PCB/LLRW liquids

WCS is authorized to accept LLRW/PCB liquids for storage. As WCS does not possess an approved technology for the destruction of LLRW/PCB liquids, each waste stream is be evaluated for acceptance on case-by-case basis.

If the waste is between 50 and 500 ppm PCB, and contains liquid which meets the definition of “incidental liquids” as defined by TSCA in 40 CFR §761.60(a)(3), WCS may solidify those liquids, and send the solidified waste to a licensed LLRW disposal facility. The generator must supply WCS with information that shows that the liquids do not exceed 500 ppm PCB and are not an ignitable waste as described in 40 CFR §761.75(b)(8)(iii).

Radioactive waste with PCBs planned for ultimate disposal in the FWF are required to meet the standards of the governing documents for the FWF, which is outside the scope of this document.

6.5.4 PCB/Low-Level Radioactive Mixed Waste (licensed radioactive hazardous waste)

6.5.4.1 PCB/LLMW Solids

Treatment requirements and capabilities at WCS are the same as listed in Section 6.5.3.3; however, WCS is not licensed to landfill this type of waste in the Subtitle C Landfill unless it can be managed in accordance with Section 7.0 of this handbook.

WCS is permitted to treat PCB/LLMW solids classified as debris that is subject to the alternate treatment standards in 40 CFR §268.45. Refer to the debris guidance in Section 1.4.3.

WCS accepts waste streams in this category that have an original PCB concentration of less than 1000 ppm for storage and/or processing on a case-by-case basis. WCS is not currently accepting waste for processing that has an original PCB concentration greater than 1000 ppm.

6.5.4.2 PCB/LLMW Liquids – Storage Only

WCS is authorized to accept PCB/LLMW liquids for storage. As WCS does not possess an approved technology for the treatment/destruction of PCB/LLMW liquids, each waste stream is evaluated for acceptance on a case-by-case basis.

WCS is not licensed to landfill this type of material in any facility unless it can be managed in accordance with Section 7.0 of this handbook.

If the waste is between 50 and 500 ppm, and contains liquid that meets the definition of “incidental liquids” as defined by TSCA and in Se, WCS may solidify those liquids, and treat the RCRA constituents if they are within the permit restrictions and guidelines for hazardous waste as discussed in this document. The generator must supply WCS with information that shows that the liquids do not exceed 500 ppm PCB and are not an ignitable waste as described in 40 CFR §761.75(b)(8)(iii).

7.0 LICENSED RADIOACTIVE WASTE AT THE TIME OF RECEIPT EXEMPTED UNDER RML R04100 LICENSE CONDITION 192 (EXEMPT BY LC 192)

WCS’ Radioactive Materials License R04100 License Condition 192 (LC 192) is an alternative method for obtaining a radioactive waste exemption as stipulated through 30 TAC §336.5(a) (relating to exemptions from the application of radioactive waste rules in 30 TAC §336) and 30 TAC §90.

LC 192 and WCS Procedure RS-5.0.0, *Exemption Process for the RCRA Landfill*, are used together to exempt waste that is not prohibited by law from exemption and will not result in a significant risk to public health, public safety or the environment. This section is not applicable to waste that is exempt by rule (as discussed in Section 8.0). Section 7.0 differs from Section 8.0 in that TCEQ exemption concurrence (if required) is completed after receipt at WCS. Section 8.0 exempt by rule waste must be approved by TCEQ before shipping.

NOTE:

1. The isotopic concentration limits are established so that dose does not exceed 1 mrem/yr to any member of the public. These concentration limits are set forth in WCS Procedure RS-5.0.0, Attachment 2 Table 1. The sum-of-fractions rule applies when more than one isotope is present. These limits are applied on a package by package basis.
2. The curie concentration limits for each radionuclide listed in RS-5.0.0, Attachment 2, Table 1 include the in-growth of their progeny for 1,000 years. This is important when evaluating whether or not a waste stream is suitable for exemption.

LC 192 allows for a broader range of isotopes, isotopic concentrations and waste forms to be exempted than the “exempt by rule” categories. Packages contaminated with isotopes within the limits of procedure RS-5.0.0, Attachment 2, Table 1 can be exempted as per RS-5.0.0.

WCS is permitted to evaluate LLRW, MLLW, NORM, Oil & Gas NORM and 11e.(2) byproduct materials under LC 192 and RS-5.0.0. LC 192 does not allow exemption of manufactured depleted uranium metal items (i.e., collimators,

warheads, unlabeled or unimpressed counterweights, etc.) that are eligible for exemption under 25 TAC §289(d)(3). Refer to Section 8.6 for specific exemptions available for manufactured depleted uranium metal items.

NOTE:

Waste received for processing and disposal under LC 192 does not require importation approval from the TLLRWCC.

7.1 Generator Requirements

Generators shall provide a detailed isotopic evaluation of waste material that includes an analysis for hard-to-detect radionuclides known or believed to be present. Generator knowledge may also be adequate for hard to detect radionuclides in the case of non-production facilities where the source of radioactive material is specifically known. Sampling and analysis will still be necessary to determine the waste concentration of each isotope determined to be present in the waste.

The generator must determine if the waste stream is homogenous. WCS will consider waste received at WCS as homogeneous if the dose rates taken at different points of the conveyance and/or container are within a factor of ten (10) of the average dose rate. WCS will verify that waste is homogeneous by randomly sampling 10% of the containers/packaging for each shipment under an approved profile. In addition to the homogeneity requirements, no discrete item or package can exceed 75 mrem per hour at contact (unshielded).

7.2 Determination of Waste Profile Tier Assignment

There are three Tiers defined in WCS Procedure RS-5.0.0 using RS-5.0.0, Attachment 2, Table 1. WCS will assist in determining the Tier assignment.

- Tier 1: For each package, the isotopic concentrations sum of fractions is less than < 0.30
- Tier 2: For each package, the isotopic concentrations sum of fractions is between 0.30 and 0.80
- Tier 3:
 - For each package, the isotopic concentrations sum of fractions is > 0.80 , but less than 1.0.
 - Wastes containing depleted uranium (U-Dep) are automatically Tier 3
 - Containers that have a sum of fractions of 1.0 or greater are not eligible for disposal under LC 192

NOTE:

There is a dose rate limit of 75 mR/hr on contact with the unshielded waste under the LC 192 process.

7.3 LC 192 Generator Minimum Sampling Frequency Determination

Sampling is defined as *in situ* measurements or direct sampling. Acceptable methods include gamma spectroscopy (*in situ* measurements of containers or *ex situ* multi-point composite samples), liquid scintillation for low energy beta emitters and alpha spectroscopy. Presently, “Dose to Curie” conversions and other techniques are not permitted as part of WCS Procedure RS-5.0.0. Direct samples taken by the generator shall be analyzed in a laboratory meeting the requirements of 30 TAC §25.6, included in Section 5.5. The sample data must be submitted with the waste profile, and WCS may require additional samples following review of the generator data.

Table 8 – LC 192 Generator Minimum Sampling Frequency Determination

Estimated volume for shipment under the waste profile	Minimum Number of Samples per Waste Profile
1-10 Containers	1
>10 Containers, and <500 yd ³ of waste	3
>500 yd ³ of waste	3 samples for first 500 yd ³ , 1 sample for each additional 500 yd ³

>2,000 yd ³	3 samples for first 500 yd ³ , 1 sample for each additional 500 yd ³ , up to 2000 yd ³ . If a generator has shipped more than 2,000 yd ³ of waste under a single profile without any characterization discrepancies, and/or where the point of generation or the physical or radiological characteristics have not changed, 1 sample for each additional 2,000 yd ³ . If there were discrepancies, or the point of generation, or the physical or radiological characteristics changed, the generator is required to provide 1 sample for each additional 500 yd ³ until a consecutive 2,000 yd ³ has no characterization discrepancies, the point of generation changes, or the physical or radiological characteristics change.
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Examples: If 16 containers totaling 423 cubic yards of waste are profiled, three (3) samples are required. If 1,600 cubic yards of waste are profiled, six (6) samples are required.

7.4 LC 192 WCS Waste Verification Process Summary

Prior to issuance of shipment approval, WCS will compare the draft manifest for compliance with the approved waste profile.

During waste receipt, containers will be evaluated for radiological homogeneity.

Following receipt of waste, WCS will verify the radiological content of 100% of waste containers through *in situ* measurements, direct sampling, “Dose to Curie” conversions or other approved verification techniques. WCS will during verification, whenever practical, try to use the same sampling methods as the generator. In the event that waste is received at WCS that is determined to be non-homogenous, WCS will develop a sampling plan that is adequate to properly verify the waste prior to exemption.

Table 9 – LC 192 WCS Minimum Sampling Frequency Determination

Tier	<i>in situ</i> Measurements or Direct Sampling	Dose to Curie or Other Approved Verification Techniques
1	- Every 10th package - Dose to Curie performed on all remaining packages Note: If the packages have a SOF < 0.07 based on the manifested values, WCS will perform Dose to Curie on all Packages	All Other Containers
2	First 6 packages and every 10th package thereafter	All Other Containers
3	100% of containers Note: For packages that are Tier 3 because they contain DU, but have a SOF at Tier 1 levels, packages may be sampled at the Tier 1 sampling frequency	None
Note: 10% of all incoming packages (regardless of tier) will be verified as homogeneous by ensuring that all contact dose rate readings are within a factor of 10 of the average contact reading.		

7.5 WCS Notifications to TCEQ and Exemption Determination

WCS notifications to TCEQ and exemption determination will generally be submitted by profile and manifest.

- Tier 1 and Tier 2: WCS Approval with quarterly notification to TCEQ
- Tier 3: TCEQ approval is required prior to disposal.

8.0 EXEMPT RADIOACTIVE WASTE AT THE TIME OF RECEIPT (EXEMPT BY RULE)

WCS is authorized to perform RCRA treatment and disposal of exempt radioactive material. These wastes are mostly described in 25 TAC §289.251 and 289.259. Refer to TCEQ Publication RG-486 *Disposal of Exempt Waste That*

Contains Radioactive Material for additional detail on wastes eligible for exemption and their corresponding requirements.

Section 8.0 differs from Section 7.0 as the TCEQ exemption concurrence process is completed *prior* to profile approval, shipment approval and receipt at WCS.

The most common exempt wastes accepted for storage, processing and/or disposal at WCS are described in this section. Additional exempt radioactive waste categories exist and are described in 25 TAC and RG-486.

Source material and NORM waste volumetrically contaminated with transuranic isotopes [plutonium (Pu), americium (Am), neptunium (Np), berkelium (Bk), curium (Cm) and californium (Cf)] are generally not eligible for exemption. There are limited exemptions for specific items containing transuranic isotopes (i.e., smoke detectors, release for unrestricted use of surface contaminated objects). Disposal of material previously licensed under the AEA may require NRC or Agreement State approval.

8.1 General Criteria used for Documenting Exempt by Rule Eligibility

These criteria generally apply to bulk wastes not under a specific item exemption.

- The maximum volume of material over which concentration averaging can be performed is 20 yd³
- No single measurement that exceeds 10 times the exemption criteria shall be used to calculate an average volumetric concentration
- The samples are representative of the material (minimum of a four-point composite sample) or conservatively biased to provide maximum values
- Analytical data must be allowable under the requirements of 30 TAC §25.6, included in Section 5.5.
- Each waste container is considered individually and must independently meet the exemption criteria
- Bulk analysis (*in situ* analysis of the entire contaminated volume) is an acceptable methodology for release of bulk material for disposal
- For the purpose of demonstrating radioactive material meets the exemption requirements for disposal, a sampling and/or characterization plan/methodology may need to be submitted with the waste profile
- For bulk soil or rubblized debris, a composite sample (or equivalent waste stream specific approved methodology) is normally required for the equivalent of 20 cubic yards of waste. For other waste streams, such as contaminated equipment, site-specific approval of the sampling and characterization methodology may be required
- Surface contaminated debris can be released for disposal by direct sampling only if the material is rubblized such that bulk samples can be taken and analyzed and the activity is directly expressed as pCi/g. Surface contamination measurements cannot be converted to average bulk activity concentrations for the purpose of meeting the exemption criteria. If not rubblized, contaminated debris must meet the acceptable surface contamination release limits [Equivalent to NRC Regulatory Guide 1.86 *Termination of Operating Licenses for Nuclear Reactors* and 30 TAC §336.364 (citing 30 TAC §336.605 Appendix G)]. No single surface measurement may exceed 10 times the appropriate acceptable surface contamination average limit.

8.2 Release for Unrestricted Use of Surface Contaminated Objects as Defined in 30 TAC §336.605

If the surface contaminated objects (SCO) were released for unrestricted use (through procedures approved by the regulatory license reviewers and inspectors), WCS shall review the documentation prior to approving the waste stream as exempt radioactive waste. Generally, completion of the radiological data section of WCS Form WA-1.0-1, *Waste Profile*, is not required.

Table 10 – Acceptable Surface Contamination Levels from 30 TAC §336.364 Appendix G

Radionuclide ¹	Average ^{2,3,6}	Maximum ^{2,4,6}	Removable ^{2,3,5,6}
U-natural, U-235, U-238, and associated decay products except Ra-226, Th-230, Ac-227, and Pa-231	5,000 dpm alpha/100 cm ²	15,000 dpm alpha/100 cm ²	1,000 dpm alpha/100 cm ²
Transuranics, Ra-223, Ra-224, Ra-226, Ra-228 Th-natural, Th-228, Th-230, Th-232, U-232, Pa-231, Ac-227, Sr-90, I-125, I-126, I-129, I-131, and I-133	1,000 dpm/100 cm ²	3,000 dpm/100 cm ²	200 dpm/100 cm ²
Beta-gamma emitters (radionuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above	5,000 dpm beta-gamma/100 cm ²	15,000 dpm beta-gamma/100 cm ²	1,000 dpm beta-gamma/100 cm ²

- Where surface contamination by both alpha- and beta-gamma-emitting radionuclides exists, the limits established for alpha- and beta-gamma-emitting radionuclides should be applied independently.
- As used in this appendix, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.
- Average contamination level shall not be measured over more than 1 square meter. For objects of less surface area, the average shall be derived for each object.
- The maximum contamination level applies to an area of not more than 100 square centimeters (cm²).
- The amount of removable radioactive material per 100 cm² of surface area shall be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels shall be reduced proportionally and the entire surface shall be wiped.
- The average and maximum radiation levels associated with surface contamination resulting from beta-gamma emitters shall not exceed 0.2 millirad/hour at 1 cm and 1.0 millirad/hour at 1 cm, respectively, measured through not more than 7 milligrams/cm² of total absorber.

8.3 Small Quantities of Radium or Naturally Occurring Radioactive Material (NORM) in Soil or Other Media as Defined by 25 TAC §289.259(d)

NOTE:

The radon-220 emanation rate, formed by the decay of radium-228 contaminated material, would likely be undetectable due to the extremely short half-life of radon-220. The radon-emanation rate specified in 25 TAC §289.259(d) does not apply to:

- known NORM types for which the radon-emanation fraction has been documented to be low, e.g. oil-production scales and sludges;
- soil in which the known volume of NORM would be too low to produce a radon-emanation rate of 20 pCi/m²/s (as demonstrated by calculation); or
- soil that has been displaced from its natural location and is to be disposed of in a (permitted) disposal site for hazardous material.

NORM waste is exempt for purposes of disposal under 25 TAC §289.259(d) if it contains, or is contaminated at, the following concentrations in soil or other media:

- 30 picocuries per gram (pCi/g) or less of radium-226 or radium-228 provided the radon emanation rate is less than 20 picocuries per square meter per second (pCi/m²/sec)
- 5 pCi/g or less of radium-226 or radium-228 in which the radon emanation rate is equal to or greater than 20 pCi/m²/sec
- 150 pCi/g or less of any other NORM radionuclide

Radium-226 and radium-228 are considered separately, so both isotopes can be up to the limit (30 or 5 pCi/g) and still be exempt. Typically, Ra-226 is present in larger quantities than Ra-228. Other media is defined in 25 TAC §289.259(c)(5) as “any volumetric material other than soils or liquids (for example: sludge, scale, slag, etcetera [sic]).”

8.4 Source Material as Defined by 25 TAC §289.251(d)(1) and (2)

8.4.1 Weight Percent of 0.05

Source material (uranium or thorium) in any physical or chemical form, solution or alloy in which the source material is <0.05% by weight (1/20th of 1 percent). Enriched uranium is not eligible for this exemption. This translates to the following concentrations:

Table 11 – Specific-Activity Values for 0.05 Weight Percent of Source Material

Isotope or Material	Specific Activity
Thorium-232	54.9 pCi/g
Uranium-235	1,078 pCi/g
Uranium-238	167.5 pCi/g
Natural Thorium	100 pCi/g of total Thorium ¹
Natural Uranium	340 pCi/g of total Uranium ²
Depleted Uranium	199 pCi/g of total Uranium ³

1. Th-232 is in secular equilibrium with its daughter Th-228 (both isotopes are at an equal activity level).
2. By activity, 48.8% U-234 (daughter of U-238), 2.4% U-235, and 48.8% U-238
3. Typically, by activity, 15.2% U-234, 1.1% U-235 and 83.7% U-238

8.4.2 Unrefined or Unprocessed Ores as Defined by 25 TAC §289.251(d)(2)

Unrefined and unprocessed ore containing source material are exempt provided that the ore has not been refined or processed. This exemption does not apply to the mining of ore containing source material for the extraction of source material.

8.4.3 Rare-Earth Elements with Source Material as Defined by 25 TAC §289.251(d)(A)(vi)

Rare-earth metals and compounds, mixtures, and products containing no more than 0.25% by weight of thorium, uranium, or any combination of these are exempt.

8.5 Specific Items Containing Source Material as Defined by 25 TAC §289.251(d)(3)

Specific items do not require supporting analytical data as they are identified for exemption by the nature of the item.

NOTE:

Disassembled “Specific Items” or manufactured articles, including smoke detectors, lose exemption eligibility.

8.5.1 Thorium as Defined in 25 TAC §289.251(d)(3)(A)

The following specific items containing thorium are exempt, provided that they meet the weight percentage and other requirements found in the rule.

- Incandescent gas mantles: any quantity of thorium
- Vacuum tubes: any quantity of thorium
- Welding rods: any quantity of thorium
- Electric lamps used for illuminating: no more than 50 mg thorium per lamp
- germicidal lamps, sunlamps, and lamps for outdoor or industrial lighting: no more than 2 g thorium per lamp
- personnel neutron dosimeters: no more than 50 mg thorium per dosimeter
- finished optical lenses: no more than 30% by weight of thorium
- finished aircraft-engine parts containing nickel-thoria alloy
- finished product or part containing metal-thorium alloys not exceed 4% thorium by weight

8.5.2 Uranium as Defined in 25 TAC §289.251(d)(3)(H)

Uranium contained in detector heads for use in fire-detection units is exempt, provided that each detector head contains not more than 0.005 microcuries (μCi) of uranium.

- Detectors must be intact to qualify for this exemption. That is, the cover must not have been removed, nor the source removed from the unit.
- Required documentation to qualify for this exemption is typically either a sealed-source-and-device (SS&D) sheet or a copy of the radioactive-material license that identifies the make and model of the smoke detector as exempt. The SS&D sheet can be obtained from the manufacturer. If it is unobtainable, the state regulator has access to additional resources not available to the public that may be able to identify the detector's make and model as exempt. If documentation cannot be found, then that item cannot be exempted under this rule.

8.5.3 Source Material as Defined in 25 TAC §289.251(d)(3)(B) and (C)

The following specific items containing uranium are exempt, provided that they meet the weight percentage and other requirements found in the rule.

- glazed ceramics (for example tableware): the glaze may not contain more than 20% source material by weight
- glassware (except commercially manufactured glass or ceramic used in construction): no more than 10% source material by weight
- glass enamel or glass-enamel frit imported or ordered for importation into the U.S., or initially distributed by manufacturers in the U.S., before July 25, 1983: no more than 10% source material by weight
- piezoelectric ceramic: no more than 2.0% source material by weight
- photographic film, negatives, and prints: no weight-percent limit

8.6 Specific Items containing Depleted Uranium (DU)

Specific items do not require supporting analytical data as they are identified for exemption by the nature of the item. 25 TAC §289.251(d)(3) does not permit the disposal of DU projectiles or warheads.

NOTE:

Disassembled "Specific Items" or manufactured articles, including smoke detectors, lose exemption eligibility.
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8.6.1 Shielding as Part of a Shipping Container as Defined in 25 TAC §289.251(d)(3)(F)

Depleted uranium is exempt if it is used as shielding constituting part of any shipping container, provided that the shipping container is conspicuously and legibly impressed with the legend "CAUTION – RADIOACTIVE SHIELDING – URANIUM;" is intact and unaltered, and the uranium metal is encased in mild steel or an equally fire-resistant material, with a wall thickness of at least 1/8 inch.

8.6.2 Counterweights Installed in Aircraft, Rockets, Projectiles and Missiles as Defined in 25 TAC §289.251(d)(3)(E)

- The counterweights are manufactured in accordance with a specific license issued by the NRC authorizing distribution by the licensee in accordance with 10 CFR §40
- Each counterweight has been impressed with the following legend clearly legible through any plating or other covering: "DEPLETED URANIUM" ("CAUTION – RADIOACTIVE MATERIAL – URANIUM" if manufactured prior to December 31, 1969)
- Each counterweight is durably and legibly labeled or marked with the identification of the manufacturer and the statement: "UNAUTHORIZED ALTERATIONS PROHIBITED" ("CAUTION – RADIOACTIVE MATERIAL – URANIUM" if manufactured prior to December 31, 1969).

8.7 Specific Items as Defined in 25 TAC §289.251(e)(3)

NOTE:

Disassembled “Specific Items” or manufactured articles, including smoke detectors, lose exemption eligibility.

Specific items do not require supporting analytical data as they are identified for exemption by the nature of the item. The following items, which incorporate radioactivity for functional purposes, are exempt if they meet the isotope, activity and radiation exposure levels in their respective rules:

- Timepieces, hands, or dials containing tritium, radium-226 or promethium-147
- Automobile lock illuminators containing tritium or promethium-147
- Precision balances containing tritium
- Automobile shift quadrants containing tritium
- Marine compasses and other marine navigational instruments containing tritium gas
- Thermostat dials and pointers containing tritium
- Electron tubes (including spark-gap tubes, power tubes, gas tubes, glow lamps, receiving tubes, microwave tubes, indicator tubes, pick-up tubes, radiation detection tubes, and any other completely sealed tube designed to control electrical currents)
- Instruments for measuring ionizing radiation containing, for purposes of internal calibration or standardization, a source of radioactive material
- Spark-gap irradiators, containing cobalt-60, for use in electrically ignited fuel-oil burners having a firing rate of at least 3 gallons per hour
- Capsules containing carbon-14 urea for in vivo diagnostic use in humans
- Self-luminous products containing tritium, krypton-85, or promethium-147
- Items that contain less than 0.1 μCi of radium-226 if received, possessed, used, transferred, or owned prior to January 1, 1986
- Ionization-chamber smoke detectors containing no more than 1 μCi of americium-241 per detector in the form of a foil and designed to protect life and property from fire
- Detectors must be intact to qualify for this exemption. That is, the cover must not have been removed, nor the source removed from the unit.
- Gas and aerosol detectors containing radioactive material designed to protect life or property from fires and airborne hazards are exempt provided that the detectors were manufactured, imported, or transferred in accordance with a specific license issued by the NRC, an agreement state or a licensing state which authorizes the initial transfer of the detectors to persons who are exempt from regulatory requirements:
 - Detectors must be intact to qualify for this exemption. That is, the cover must not have been removed, nor the source removed from the unit.
 - Required documentation to qualify for this exemption is typically either a sealed-source-and-device (SS&D) sheet or a copy of the radioactive-material license that identifies the make and model of the smoke detector as exempt. The SS&D sheet can be obtained from the manufacturer. If it is unobtainable, the state regulator has access to additional resources not available to the public that may be able to identify the detector’s make and model as exempt. If documentation cannot be found, then that item cannot be exempted under this rule.

8.8 Specific Items containing Oil Production NORM

8.8.1 Waste Generated in Texas under Authority of the Railroad Commission of Texas (RRC)

Pipe (tubulars) and other downhole or surface equipment used in oil production contaminated with NORM scale or residue are exempt if the maximum radiation exposure level, including the background radiation level, does not exceed 50 microRoentgens per hour ($\mu\text{R/hr}$) at any accessible point per 25 TAC §289.259(d)(3). Contact WCS for the current interpretation of this rule for gas production equipment generated within the State of Texas.

8.8.2 Waste Generated outside of Texas and under Authority of the TCEQ

Out-of-state oil production wastes are eligible for the RRC dose rate-based exemption criteria of Section 8.8.1. The current interpretation of this rule prohibits use for out-of-state gas production equipment.

8.9 Specific Items from Building, Construction, Industrial Processing and Other Items containing NORM

Specific items do not require supporting analytical data as they are identified for exemption by the nature of the item. The following materials commonly contain NORM at relatively high concentrations (but have not been concentrated to higher levels than those found in their natural state and are therefore exempt):

- Refractory bricks: NORM is not concentrated during use in a furnace and is therefore exempt under 25 TAC §289.259(d)(5)(C)
- Zirconium oxide (zircon, zirconium): commonly used as a blasting agent. It has a typical total activity of 130 pCi/g to 145 pCi/g but contains a higher activity of radium (greater than 30 pCi/g) than uranium and thorium. It is exempt under 25 TAC §289.259(d)(5)(C) as a NORM material used in industrial processing in which radionuclide content has not been concentrated to higher levels than found in its natural state
- Monazite sand containing thorium-232 and its daughters
- Alumina, used for ceramic insulators in electrical equipment

8.10 Specific Potassium and Byproducts from Fossil-Fuel Combustion as Defined in 25 TAC §289.259(d)(5)

Specific items do not require supporting analytical data as they are identified for exemption by the nature of the item. The following products and materials and the recycling of equipment or containers used to produce, contain, or transport them, are exempt:

- potassium and potassium compounds that have not been isotopically enriched in the radionuclide K-40
- byproducts from fossil-fuel combustion (bottom ash, fly ash, and by-products of flue-gas emission control)

8.11 Specific Emission-Control Dust from Electric-Arc Furnaces as Defined in 25 TAC §289.259(d)(5) (Radiologically Contaminated K061 Waste)

Emission-control dust and other material from electric-arc furnaces or foundries contaminated as a result of inadvertent melting of cesium-137 or americium-241 sources may be transferred for disposal to a hazardous waste disposal facility authorized by the TCEQ without regard to its radioactivity if all of the conditions of 25 TAC §289.202(ff)(2) are met. The exemption does not apply to inadvertent melting of cobalt-60 sources.

9.0 SELECTION OF A TRANSPORTER

Transporters must be registered in compliance with applicable state and federal laws. TCEQ issued RG-086, *Transporting Waste in Texas – A Guide to Regulations* that summarizes the registrations commonly expected of waste transporters.

All waste generators, brokers and transporters must sign and return *Waste Transportation Requirements* found in Section 19.1 of this document. Waste transporters must meet WCS' insurance requirements, included in the client's ESA and available from Customer Service or WCS' Purchasing Agent, prior to entering the site. While the information is intended to be shared with drivers, an authorized representative for each waste generator (technical contact), broker and transporter (dispatcher) is to complete the form.

New transporters are welcome, 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, and are summarized in Section 19.2, *Waste Transporter Insurance Requirements*.

All shipments of waste received by WCS must conform to US DOT regulations in 49 CFR §100 through 49 CFR §185, NRC regulations in 10 CFR §71, and RCRA regulations in 40 CFR §261 through 40 CFR §268 plus additional state regulations.

Each waste package shall be prepared for shipment to minimize damage during transit. Damage or contamination incurred during transit is the responsibility of the generator, and must be appropriately addressed prior to acceptance by WCS.

9.1 Shipment by Highway

WCS accepts waste and freight shipments by highway. Waste shipments by common carrier (i.e., UPS, FedEx) are prohibited. The WCS facility is located 30.3 miles west of the intersection of Mustang Drive and State Highway 176/Ranch Road 87 in Andrews, TX, and is located 3.4 miles east of the intersection of State Highway 18 and State Highway 176/234 in Eunice, NM. WCS' entrance is at the Texas/New Mexico border, on the north side of the State Highway 176. If using a global positioning system (GPS), search for the intersection of County Road 9999 and State Highway 176 as WCS' address will generally not work. WCS' main gate area is at Latitude 32.435613, Longitude -103.063002.

9.2 Shipment by Rail

WCS accepts waste and freight shipments by rail. To ship by rail, the customer sets up a waybill to Track 106, Windmill Hill Station, New Mexico. Union Pacific Railroad (UP) takes the shipment to the Monahans, TX yard for pick up by [WATCO Companies LLC DBA Texas and New Mexico Railway](#) (TXN). TXN is a switching carrier and may not appear on the waybill; however, every carrier including TXN must appear on a UHWM.

In addition to the waybill, UHWM and/or NRC manifests are required, as appropriate, with other documents comprising the shipping papers. WCS does not require attachment of shipping papers to each gondola or intermodal. WCS' Transportation Coordinator shall sign the UHWM on behalf of the final rail transporter (TXN). Per 40 CFR §263.20(f)(2), intermediate rail transporters are not required to sign manifests or shipping papers.

Shipping papers may be mailed; however, they must arrive **prior** to the shipment. WCS receives US Mail, FedEx and UPS deliveries once per day in the afternoon, and Saturday delivery is not available in this region.

9.3 Demurrage

9.3.1 Highway

It is extremely important that transporters arrive at their scheduled gate time. WCS does not compensate generators or transporters for demurrage charges if the driver has not checked in with the WCS Security Officers within 15 minutes on either side of the scheduled time slot. A typical unloading time at WCS is four (4) hours. WCS does not guarantee unload durations. If a truck is unloaded within 4 hours of the scheduled unloading time, WCS does not compensate generators or transporters for demurrage charges. Highway demurrage may also be handled contractually on a case-by-case basis.

If a truck is delayed due to waste or paperwork non-conformances, WCS does not compensate generators or transporters for demurrage charges.

9.3.2 Rail

Rail service to the WCS facility is outside the control of WCS. Rail demurrage is handled contractually on a case-by-case basis.

10.0 INBOUND WASTE SHIPMENT REQUEST FORM

Each shipment of waste to WCS must be pre-approved. Customers shall complete and submit WCS Form WA-2.0-1, *Inbound – Waste Shipment Request* with an advance draft manifest and shipping documentation at least five (5) business days before arrival. The waste profile number must be used on all shipping paperwork and correspondence related to the material. WCS may waive the five (5) business day notification and advance draft manifest requirements at WCS' sole discretion. After the shipment request is approved, the customer is provided with written shipment approval and confirmed gate dates and times. Shipping documentation may include, and is not limited to:

- Exempt and licensed radioactive waste shipment requests shall include, a pre-shipment survey for each conveyance
- WCS Procedure OP-1.2.22 Attachment 4, *Certification of SNM Manifest Information*, as applicable
- *Lab Pack Inventory*, as applicable

- *Key to Multiple Line Manifests*, as applicable
- *Land Disposal Restriction Notification/Certification*, as applicable
- *PCB Continuation Sheet*, as applicable
- *Asbestos Record of Shipment*, as applicable
- EPA Form 8700-22, *Uniform Hazardous Waste Manifest*, as applicable
- EPA Form 8700-22A, *Uniform Hazardous Waste Manifest (Continuation Sheet)*, as applicable
- NRC Form 540, *Uniform Low-Level Radioactive Waste Manifest – Shipping Paper*, and NRC Form 540A *Continuation*, as applicable
- NRC Form 541, *Uniform Low-Level Radioactive Waste Manifest – Container and Waste Description*, and NRC Form 541A *Continuation*, as applicable
- NRC Form 542, *Uniform Low-Level Radioactive Waste Manifest – Manifest Index and Regional Compact Tabulation*, and NRC Form 542A *Continuation*, as applicable
- NRC Form 741, *Nuclear Material Transaction Report*, as applicable
- NRC Form 741A, *Nuclear Material Transaction Report (Continuation)*, as applicable

11.0 PROPER COMPLETION OF SHIPPING DOCUMENTATION

11.1 EPA Form 8700-22, Uniform Hazardous Waste Manifest (UHW)

All manifests for solid wastes and hazardous wastes must be prepared according to the instructions found in the Appendix to 40 CFR §262, and must also contain the TCEQ solid waste registration number (Texas Waste Code) for each waste. Additionally, instructions are pre-printed on the back of the UHW and available in greater detail from EPA's Hazardous Waste Manifest System webpage <http://www.epa.gov/wastes/hazard/transportation/manifest/>

11.1.1 Items 6 and 7, Transporters

Each transporter must be listed on the UHW. Generally, shipments by highway have one (1) or two (2) transporters listed in Items 6 and 7, respectively. Shipments by rail may have three (3) or more transporters, and the third and subsequent transporters must be recorded on EPA Form 8700-22A, *Uniform Hazardous Waste Manifest (Continuation Sheet)*. The second to last rail transporter is always UP and final transporter is TXN.

Table 12 – Selected Railroad EPA ID Numbers

Railroad	EPA ID Number
BSNF Railways (BNSF)	MND048341788
CSX Transportation (CSX)	FLD006921340
Paducah & Louisville Railroad (PAL)	KYD000735845
Port Terminal Railroad Association (PTRA)	TXD981153364
Union Pacific Railroad (UP)	NED001792910
WATCO Companies LLC DBA Texas and New Mexico Railway (TXN)	NMR000020255

11.1.2 Item 8, Designated Facility

Item 8, Designated Facility Name and Site address must be completed as shown below

8. Designated Facility Name and Site Address Waste Control Specialists LLC TSD Facility 9998 W. State Hwy. 176 Andrews, TX 79714 Facility's Phone: 432-525-8500	U.S. EPA ID Number TXD988088464
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11.1.3 Items 9-12, Line Items

- If more than four line items of waste are shipped, they must be recorded on EPA Form 8700-22A, *Uniform Hazardous Waste Manifest (Continuation Sheet)*.

- Each line item under Item 9a, *HM* through 13, *Waste Codes*, must pertain to only one WCS-approved profile and carry the same RCRA and/or State Waste Codes.
- If the manifest has more than one line item, WCS must be able to determine which containers apply to each line item of Item 9. The example found in Section 19.4, *Key to Multiple Line Manifests*, works well for this purpose.
- Item 11, *Total Quantity*, cannot have entries with decimal points or fractions. The use of commas is discouraged. PCB shipments must have the weight listed in kilograms

11.1.4 Item 13, Waste Codes

11.1.4.1 RCRA Hazardous Waste Codes

Enter up to six federal and state waste codes to describe each waste stream identified for each line item. State waste codes that are not redundant with federal codes must be entered here, in addition to the federal waste codes which are *most representative of the properties of the waste*. Section 11.1.4 is not a complete listing of state with state-specific waste codes.

11.1.4.2 8-character Texas Waste Code

Manifests for Texas Class 1 wastes must be prepared according to 40 CFR §262 with the addition of the Texas Waste Codes for each waste. When itemizing Class 1 waste, the Texas Waste Codes shall be used when EPA identification numbers are not required. Refer to *Appendix 2 – NRC Form and UHWM Examples*.

This 8-character Texas Waste Code must be placed in Item 13 of each line item of the UHWM, using two (2) adjacent boxes on the same row, with four (4) characters per box. WCS will assist generators in selection of codes. Out-of-state generators of non-hazardous waste cannot use a non-hazardous waste manifest to transport waste to WCS. Municipalities that are generators in the State of Texas are not required to enter an 8-character waste code on a UHWM.

11.1.4.3 California State-Specific Hazardous Waste Codes

California has over 70 state-specific waste codes for “state-listed” hazardous wastes that are not found in the federal hazardous waste rules. They are in Title 22, California Code of Regulations, Appendix XII to Chapter 11 of Division 4.5. A common code is for PCBs.

- 261 – Polychlorinated biphenyls and material containing PCB’s

11.1.4.4 New York State-Specific “B” Codes for PCB Waste

New York State generally regulates PCB wastes as listed hazardous waste under 6 New York Code of Rules & Regulations (NYCRR) §371.4(e)(1), and requires entry of the appropriate “B” code(s) on the UHWM. Generators must report to New York State that WCS disposes of all waste by land disposal and does not offer incineration.

- B001 – PCB Oil (concentrated) from transformers, capacitors, etc.
- B002 – Petroleum oil or other liquid containing 50 ppm or greater of PCBs, but less than 500 ppm PCBs. This includes oil from electrical equipment whose PCB concentration is unknown, except for circuit breakers, reclosers and cable
- B003 – Petroleum oil or other liquid containing 500 ppm or greater of PCBs
- B004 – PCB Articles containing 50 ppm or greater of PCBs, but less than 500 ppm PCBs, excluding small capacitors. This includes oil-filled electrical equipment whose PCB concentration is unknown, except for circuit breakers, reclosers, and cable
- B005 – PCB Articles, other than transformers, that contain 500 ppm or greater of PCBs, excluding small capacitors
- B006 – PCB Transformers means any transformer that contains 500 ppm PCB or greater
- B007 – Other PCB Wastes including contaminated soil, solids, sludges, clothing, rags and dredge material

11.1.4.5 Maine State-Specific Hazardous Waste Codes

Maine has over 50 state-specific waste codes for “state-listed” hazardous wastes that are not found in the federal hazardous waste rules. Maine’s Department of Environmental Protection maintains a complete list of codes. A common code is for PCBs.

- M002 – PCB and PCBs are identified as toxic wastes. This includes any chemical substance or combination of chemical substances that contain 50 parts per million or greater of PCBs

11.1.5 Item 14, Special Handling Instructions

Item 14, *Special Handling Instructions and Additional Information*, must specify the waste profile, without revision number, for each line item. The identification number of the shipping container(s) for bulk shipments must be entered.

Unit trains of gondolas, where the gondola is the package, may be recorded on one UHWM. Include an attachment listing each equipment number, gross weight, net weight and volume as this information may not fit into Item 14.

Gondolas and flat cars sent in package service must each have a UHWM. One UHWM may be used for a flat car with intermodals. It is the customer's choice to prepare a UHWM for each intermodal or for the transporting flat car. Item 14 must list the equipment number of the flat car and the equipment numbers for each intermodal.

11.1.6 Item 17, Transporter Signature

Enter the name of the person accepting the waste on behalf of the first transporter; the person is not required to be the driver of a highway shipment. Only one signature per transportation company is required.

If the first transporter is a railroad, a railroad representative must sign the manifest. Per 40 CFR §263.20(f)(2), intermediate rail transporters are not required to sign manifests or shipping papers. For multi-modal shipments (highway, rail and/or marine), please refer to 40 CFR §263.20 for additional requirements.

11.2 Land Disposal Restriction (LDR) Notification and Certification

Generators of hazardous waste or treatment facilities that offer hazardous waste for shipment to a Treatment Storage and Disposal Facility (TSDF) are required to send notification of the land disposal restrictions applicable to each waste stream. The regulations applicable to LDR are in 40 CFR §268.7. The example form found in Section 19.5, *Land Disposal Restriction Notification/Certification* complies with these requirements. If a customer uses an LDR notification form other than the example provided, it must meet the criteria of 40 CFR §268.7.

11.3 NRC Forms 540/541/542 Uniform Low-Level Radioactive Waste Manifests

Licensees who must comply with manifesting regulations are defined in 10 CFR §20 Appendix G. Typically, all shipments of LLRW and LLMW for which the consignee is a licensed LLRW disposal facility are subject to NRC manifesting requirements. WCS accepts multiple profiles on a manifest as long as the waste profile number, without revision number, is following the proper shipping name or included on additional page.

NOTE:

Every isotope manifested, including LLD values in parentheses, must be present in the waste profile. Isotopic concentrations must be less than the isotope's profiled maximum concentration. The total activity per isotope will be compared to the profile, and each isotope's profiled activity is to encompass all containers and shipments for the profile.

As a LLRW treatment and disposal facility, WCS requires generators, processors, and collectors to send NRC Form 540, 541, and 542 as required per 10 CFR §20 Appendix G. Some exempt/NORM radioactive material, although exempted from licensing and/or disposal requirements, may require shipping papers in accordance with DOT regulations. Shippers with specific questions on completing NRC Form 540, 541, or 542 may contact WCS' Customer Service Department at (888) 789-2783.

Waste must be classified using 30 TAC §336.362 Appendix E "Classification and Characteristics of Low-Level Radioactive Waste" and described in *Table 2 – 30 TAC §336.362 Appendix E, Table I, Class A and C Waste – Long Lived Isotopes* and *Table 3 – 30 TAC §336.362 Appendix E, Table II, Class A, B and C Waste – Short Lived Isotopes*. Radium-226 is a waste class driver in Texas and must be considered in waste class calculations.

WCS requires shippers to include these forms, preferably electronically, in LowTrack™ file format, with their 5-day advance shipment request to verify compliance with waste profiling and WCS license conditions. LowTrack™ files may be either locked or unlocked. Each package of low-level radioactive material must be listed separately on these forms. WCS does not consider a conveyance (e.g., van of drums, flatbed of boxes) to be a package.

Detailed instructions on completing these forms are in 49 CFR §172 and the current revision of NUREG/BR-0204, *Instructions for Completing NRC's Uniform Low-Level Radioactive Waste Manifest*.

11.4 NRC Forms 741/741A Nuclear Material Transaction Reports

DOE and NRC regulations require each licensee who ships, receives, or adjusts their physical inventory for source or special nuclear material to document and report such activities to the Nuclear Materials Management and Safeguards System (NMMSS). The documentation is submitted using NRC Form 741, and lengthy transactions use Form 741A, also. WCS requires shippers to fill out NRC Forms 741 and 741A in accordance with 10 CFR §40.64, §70.54, §72.78, §74.15, §75.34, §76.113, §76.115, §76.117, and §150.16.

Refer to the current revision of NUREG/BR-0006, *Instructions for Completing Nuclear Material Transaction Report or NMMSS User's Guide Revision 2.0*. Generators are required to fill out NRC Form 741/741A when transferring, receiving, or adjusting their inventory of uranium or thorium source material in any manner by 0.5 kilogram (rounded up to 1 kg by NMMSS) or more, or whenever the licensee transfers or receives a quantity of SNM of 0.5 (rounded up to 1 g by NMMSS) gram or more of contained uranium-235, uranium-233, or plutonium.

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' unclassified Reporting Identification Symbol (RIS) for disposal under TCEQ RML R04100 is VAD. WCS requires the licensee to list the UHWM or radioactive waste manifest number within the miscellaneous box on DOE/NRC Form 741/741A. Unclassified wastes that will only be stored, without disposal at WCS, are received under RIS XVI.

11.5 PCB Continuation Sheet

For each shipment of PCB waste, 40 CFR §761.207 requires generators to use a UHWM. The generator is required by TSCA to supply specific additional information described below. If the information cannot be legibly entered on the UHWM, a generator can use the example form provided in Section 19.6, *PCB Continuation Sheet*. Generators are not required to use this form; however, all information below is required for each container shipped.

11.5.1 For each Bulk Load of PCBs

- The identity of the PCB waste
- Earliest date of removal from service for disposal
- Weight in kilograms of the PCB waste (net weight)

11.5.2 For each PCB Article Container or PCB Container

- The unique identifying number, type of PCB waste (e.g., soil, debris, small capacitors)
- Earliest date of removal from service for disposal
- Weight in kilograms of the PCB waste contained (net weight)

11.5.3 For each PCB Article not in a PCB Container or PCB Article Container

- The serial number if available, or other identification if there is no serial number
- The date of removal from service for disposal
- Weight in kilograms of the PCB waste in each PCB Article (net weight)

11.6 Asbestos Record of Shipment

For each shipment of waste that contains asbestos, 40 CFR §61.150(d)(1) requires that the generator submit a Record of Shipment. Example form Section 19.7, *Asbestos Record of Shipment*, may be used. Generators are not required to use this specific form; however, all information below is required for each container shipped.

- The name, address, and telephone number of the waste generator
- The name and address of the local, State, or EPA Regional office responsible for administering the asbestos NESHAP program

- The approximate quantity in cubic meters
- The name and telephone number of the disposal site operator
- The name and physical site location of the disposal site
- The date transported
- The name, address, and telephone number of the transporter(s)
- A certification that the contents of the consignment are fully and accurately described by proper shipping name; are classified, packed, marked, and labeled; and are in all respects in proper condition for transport by highway according to applicable international and government regulations

11.7 Lab Pack Inventories

Lab packs are approved on a container-by-container basis. WCS requires generators to use the example form found in Section 19.3, *Lab Pack Inventory*, unless they have obtained approval from Customer Service to use an alternate form. Each *Lab Pack Inventory* or approved equivalent must be approved by Customer Service as part of the profile approval process. Any deviations after approval shall be addressed as a significant change in the profile and must be approved by Customer Service. The *Lab Pack Inventory* must accompany the shipping documentation and a copy must be attached to the applicable container.

12.0 WASTE SHIPMENT APPROVAL

WCS will review the Waste Shipment Request form 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 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. This form will contain the scheduled date and time for delivery of the shipment. This form is WCS' indication to the generator that they are authorized to ship the waste.

12.1 Waste Shipment Scheduling

- At the time of shipment request, the customer will request a specific delivery date and time. If WCS cannot accommodate the requested delivery date and/or time, WCS will contact the customer to work out a delivery date and/or time that is convenient for both WCS and the customer. Once the shipment request is approved, the customer will receive a shipment approval email which includes the approved delivery date and time.

12.2 Waste Shipment Rescheduling

If a customer is unable to make the scheduled delivery date and time, the customer should contact WCS as soon as possible to reschedule. Once a new delivery date and/or time is scheduled, WCS will send out an updated shipment approval email with the new delivery date and/or time.

12.3 WCS-Specific Waste Package Marking

Each package, except for waste transported in shielded shipping configurations, 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(s) associated with container
- Generator's unique package ID number (1, 2, 3, etc. is acceptable)
- Gross weight of container in pounds
- Any specific notations required by contract, task order or purchase order

NOTE:

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

12.4 Pre-Arrival Documentation

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

- Final manifest documents. The waste profile number must be used on all shipping paperwork and correspondence related to the material.
- Driver(s) name as it appears on their commercial driver license (CDL) and driver's cell phone number. If there will be more than one vehicle, identify the driver(s) for each vehicle and the manifests for each vehicle.
- If the shipment requestor will be unavailable on the receipt date to address non-emergency administrative items, please provide the name, email address, office and cell phone numbers for an alternate contact
- Notification if the vehicle will arrive with waste or freight not for disposal in the Subtitle C Landfill (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

13.0 WASTE SHIPMENT VERIFICATION

Waste verification will be performed on incoming shipments. The method and frequency will depend on the type of waste, ALARA and health and safety considerations. See *Appendix 3 – WCS Minimum Waste Verification Requirements* for a summary table. Waste shipment verification is generally comprised of:

- Exterior visual inspection
- Waste quantity verification
- Intrusive visual inspection
- Fingerprint analyses
- Supplemental analyses when required

13.1 Exterior Visual Inspection

All shipments arriving on site will be visually inspected for container integrity and consistent labeling. All licensed radioactive waste in shielded shipping configurations will have the exterior of the cask visually inspected for container integrity and consistent labeling. The inner packages of shielded shipping configurations may have inspection waived due to ALARA considerations.

13.2 Waste Quantity Verification

Waste quantity will be verified by combination of piece count and weight appropriate to the waste. 40 CFR §265.72(b) states "Significant differences in quantity are for bulk weight, variations greater than 10% in weight; and for batch waste, any variation in piece count, such as a discrepancy of one drum in a truckload..."

- Containerized waste manifested by piece count will be counted, and individually weighed for WCS' records. The piece count must match the manifest.
- Bulk shipments will normally be weighed "heavy" (incoming gross weight), and the empty shipment will be weighed "light" (outbound empty weight), and the difference is the net weight of the shipment. Alternatively, a known tare weight may be used or other arrangements for weight verification may be made. The net weight of the shipment will be checked for variations greater than 10% in weight against the manifest.
- The gross container weights for drums, boxes and similar items shipped on NRC Form 540/541 will be checked for variations greater than 10% in weight. This is in addition to the piece count verification. All licensed radioactive waste in shielded shipping configurations will be checked for piece count, and may be waived from weighing at WCS due to ALARA considerations.

The preferred method for resolving weight variations greater than 10% or piece count issues is to work with the generator per 40 CFR §265.72(c) and obtain verbal and written permission to modify the manifest's relevant quantity before the truck departs.

- Bulk shipments – update the weight or volume on the manifest
- Batch/piece count shipments – update the piece count

If the generator refuses to update the quantities, then the discrepancy indication space will be completed by WCS and the corresponding discrepancy reporting requirements come into effect. At a minimum for waste shipped on a UHWM, discrepancies not resolved with 15 days after receiving the waste, WCS must immediately submit to the Regional Administrator a letter describing the discrepancy and attempts to reconcile it and a copy of the manifest or shipping paper at issue.

13.3 Intrusive Visual Inspection

Each bulk container and 10% of containerized shipments are selected for intrusive visual examination. Each item not excluded from intrusive sampling or inspection will be visually compared to the waste profile. 40 CFR §265.72(b) continues "...Significant differences in type are obvious differences which can be discovered by inspection or waste analysis, such as a waste solvent substituted for waste acid, or toxic constituents not reported on the manifest or shipping paper." Please contact WCS for a list of waste that are excluded from intrusive sampling or inspection.

The preferred method for resolving differences in type is an immediate waste profile revision or manifest update as appropriate.

If the generator refuses to revise the waste profile or update the manifest, the shipment may be subject to immediate rejection or use of the discrepancy indication space by WCS and the corresponding discrepancy reporting requirements come into effect. At a minimum for waste shipped on a UHWM, discrepancies not resolved with 15 days after receiving the waste, WCS must immediately submit to the Regional Administrator a letter describing the discrepancy and attempts to reconcile it, and a copy of the manifest or shipping paper at issue.

13.4 Fingerprint Analyses

Fingerprint analyses consist of basic screening procedures performed to provide general waste identification. These analyses may be used in conjunction with other waste analyses and information to further identify a waste and/or ensure the type of on-site management chosen is suitable for that particular waste. The parameters and associated rationale of the fingerprint analyses are as follows:

- **Physical Description** (appearance) (ASTM D4979)
- **pH Screen** (ASTM D4980)
- **Water Reactivity Screen** (ASTM D5058C)
- **Flammability Potential Screen** (ASTM D4982)
- **Cyanides Screen** (ASTM D5049B, C)
- **Sulfide Screen** (ASTM D4978)
- **Radioactivity Screen.** This testing does not apply to wastes that are already known to contain exempt levels or licensed levels of radioactivity.

Each bulk container and 10% of containers from containerized shipments are selected for fingerprint analysis. Each waste container not excluded from fingerprint analysis through Section 13.3 will be analyzed and compared to the waste profile. The preferred method for resolving differences in type is either an immediate waste profile revision or manifest update, as appropriate and previously described in Section 13.3.

13.5 Supplemental Analyses

Supplemental analyses may be performed to further identify wastes, provide safety information, and/or to provide process control information, as directed by facility management. The results of these analyses provide additional confidence concerning the proper management methods. Most of the parameters which constitute the supplemental analyses utilize standard analytical techniques recognized by EPA, ASTM and other authoritative sources. Others utilize unique procedures and protocols formulated by WCS which have been developed in the absence of any standard procedures through WCS' operating experience.

13.6 Non-Compliant Waste Containers and Non-Compliant Waste Shipments

Non-compliant waste containers and non-compliant waste shipments will be addressed on a case by case basis through the WCS discrepancy resolution process. There are three types of discrepancies defined for waste at WCS:

- **Minor discrepancy** – Discrepancies that are clerical in nature, 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. These discrepancies will be noted on the Verification Form, the customer will be notified, and the errors should be corrected within 48 hours following acceptance; however, these types of discrepancies will not constitute a shipment being designated as noncompliant for receipt.
- **Moderate discrepancy** – Discrepancies that would not normally result in a non-compliance with license conditions and/or regulatory requirements, but would typically represent a discrepancy between the incoming shipment analytical results and the acceptable concentration ranges established during the profile review process.
- **Major discrepancy** – Discrepancies that could result in a non-compliance with license conditions and/or regulatory requirements, discrepancies between the characteristics of the shipped waste and the waste profile that are indicative of substantive differences (i.e., wastes that are obviously different in type from that profiled), and discrepancies that could cause an unsafe working condition (i.e., a bulging drum that could rupture).

If the generator chooses, WCS has the capability to mitigate some discrepancies at our facility.

13.7 TCEQ Resident Inspector

The TCEQ resident inspector based at the CWF may inspect every waste shipment and manifest received at the TSDF, including shipments intended for the Subtitle C Landfill or FWF. 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.

14.0 RADIOLOGICAL RELEASE OF SHIPPING CONTAINERS AND VEHICLES

14.1 Return of Vehicles and Containers used for US Department of Transportation (DOT) Class 7 (Radioactive) Shipments (LLRW, LLMW and Exempt Wastes)

WCS will perform exit surveys of vehicles and containers used for Class 7 shipments after delivery and emptying. The exit surveys will be used to determine the controls that must be applied for compliant return shipment. WCS performs these surveys without any specific request from the customer. WCS can provide copies of these surveys upon request. If emptied containers are too contaminated for compliant return shipment in accordance with DOT regulations or contract requirements, decontamination surcharges will apply in accordance with the contract.

Note that contamination standards vary somewhat between DOT and the NRC, as well as among agreement states and the NRC. WCS' radioactive materials license standard for release is defined in 30 TAC 336.364; alternatively, NRC Reg. Guide 1.86 may apply if release is performed by contractor outside of Texas. The DOT limit on contamination for shipment without hazardous materials controls is the definition of contamination in 49 CFR 173.403. WCS provides for vehicle and container return in accordance with the following:

14.1.1 Container Return for Unrestricted Use

Only when specified by the contract, WCS will perform unrestricted release survey after unloading. If contamination levels are *below* the definition levels of contamination in 49 CFR 173.403, WCS will release the container without DOT Class 7 controls, in accordance with WCS' license. And, if contamination levels are below the TCEQ limits in 30 TAC 336.364, or subcontracted facility release criteria (e.g. Reg. Guide 1.86 where applicable), the release will be for unrestricted use. If decontamination is required to meet the applicable standard, WCS will provide that service in accordance with contract terms.

14.1.2 Container Return for Radioactive Service Only

WCS will perform an exit survey after each unloading. If surveyed contamination levels are *above* the definition levels of contamination in 49 CFR 173.403, WCS will return the container as "empty" in

accordance with 49 CFR 173.428; or [when specified in exclusive use instructions of shipments made in accordance with 49 CFR 173.427(b)(4) or (c)] in accordance with 49 CFR.443. If decontamination is required to meet the applicable standard, WCS will provide that service in accordance with contract terms.

14.1.3 Radioactive Service, with Unrestricted Final Release

When the contract specifies, WCS will release containers for radioactive service only during the life of a project in which containers are in continuous reuse, with a final unrestricted release survey at the end of the project. Any decontamination and survey needed to comply with standards will be paid by customer. If decontamination is required to meet the applicable standard, WCS will provide that service in accordance with contract terms.

14.1.4 Vehicle Return

For vehicles and other conveyances not used as containers, WCS will perform a survey to verify radioactive contamination has occurred or not occurred upon arrival and before departure in accordance with its license (ref 30 TAC 336.364) and 49 CFR173.403 – Transportation requirements. WCS will release in accordance with its license and the DOT requirements. If decontamination is required to meet the applicable standard, WCS will provide that service in accordance with contract terms.

14.1.5 Type A and Type B Shipping Casks

WCS will return shipping casks to the Customer as “empty” in accordance with 49 CFR 173.428. If decontamination is required to meet the applicable standard, WCS will provide that service in accordance with contract terms.

14.2 Exempt Wastes and Non-Radioactive Wastes not Transported as DOT Class 7

WCS conducts surveys on incoming exempt/NORM wastes to verify that the waste meets the specific conditions of the approved waste profile. However, WCS does not normally perform RTS or unconditional release surveys of these vehicles or outgoing empty containers. RTS or unconditional release surveys are available and a surcharge applies. The RTS or unrestricted release surcharge may be incorporated into the quote or contract document.

15.0 GENERAL SITE INFORMATION

15.1 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 8:00 a.m. to 3:00 p.m., with the last scheduled load entering at 2:00 p.m. Generators may request alternate days and hours for receipt; each request will be evaluated on case-by-case basis.

15.1.1 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.

15.1.2 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 operating hours. The facility generally can predict 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.

15.2 Weather Related Delays

As WCS’ disposal facilities and some storage locations are outdoors and open to the elements, inclement weather may impact unload duration.

15.2.1 Inclement Weather Guidelines

WCS' Health and Safety Plan provides inclement weather guidelines.

- **High Winds at or above 25 mph Sustained.** Crane operations and Subtitle C Landfill disposal of rollofs, intermodals and end dumps will be suspended.
- **High Winds at or above 35 mph Sustained.** All outdoor activities on elevated surfaces (i.e., ladders, platforms, aerial lifts, etc.) will be suspended.
- **Heavy Rain.** Addressed on a case-by-case basis. In exceptionally hard rain, WCS may delay a cask shipment offload to prevent excessive water entering the cask and MCC while they are open for offloading. Heavy rain tends to pass within one hour.
- **Lighting.** All outdoor activities will be suspended when a thunder and lightning storm is present.
- **Ice/Snow/Fog.** Addressed on a case-by-case basis. Casks arriving encased in ice must be thawed prior to unloading.

15.2.2 Operations within Disposal Facilities

WCS is not allowed to dispose of waste in the disposal cell while in standing water. At a minimum, WCS will mitigate the water issue in the work area; not the entire cell. All disposal facilities have pumping capabilities, and there are alternative mitigation measures allowed by WCS' permits and licenses.

15.3 Unscheduled Waste Shipments

WCS reserves the right to reject unscheduled shipments. The facility makes a reasonable effort to receive unscheduled shipments within a timely manner; however surcharges may apply to unscheduled loads.

15.4 “Designated Facility to Generator State” UHWM Copies

WCS automatically provides the “Designated Facility to Generator State” UHWM copies by US Mail to California, Maine, New York and Pennsylvania within 30 days of receipt. Approximately 26 states require manifest copies from generators, TSDFs, or both. The below table is not a complete list of states requiring “Designated Facility to Generator State” UHWM copies, and copies will be provided to other states upon client direction.

Table 13 – Generator State UHWM Return Addresses

California	Maine
DTSC Facility Manifests PO Box 3000 Sacramento, CA 95812-3000	Hazardous Waste Manifest Bureau of Remediation & Waste Management Maine Department of Environmental Protection 17 State House Station Augusta, ME 04333-0017
New York	Pennsylvania
NYSDEC Division of Environmental Remediation ATTN: Manifest Section 625 Broadway, 12 th Floor Albany, NY 12233-7252	PA DEP Manifest Section PO Box 8550 Harrisburg, PA 17105-8550

15.5 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 from US Mail, FedEx or UPS.

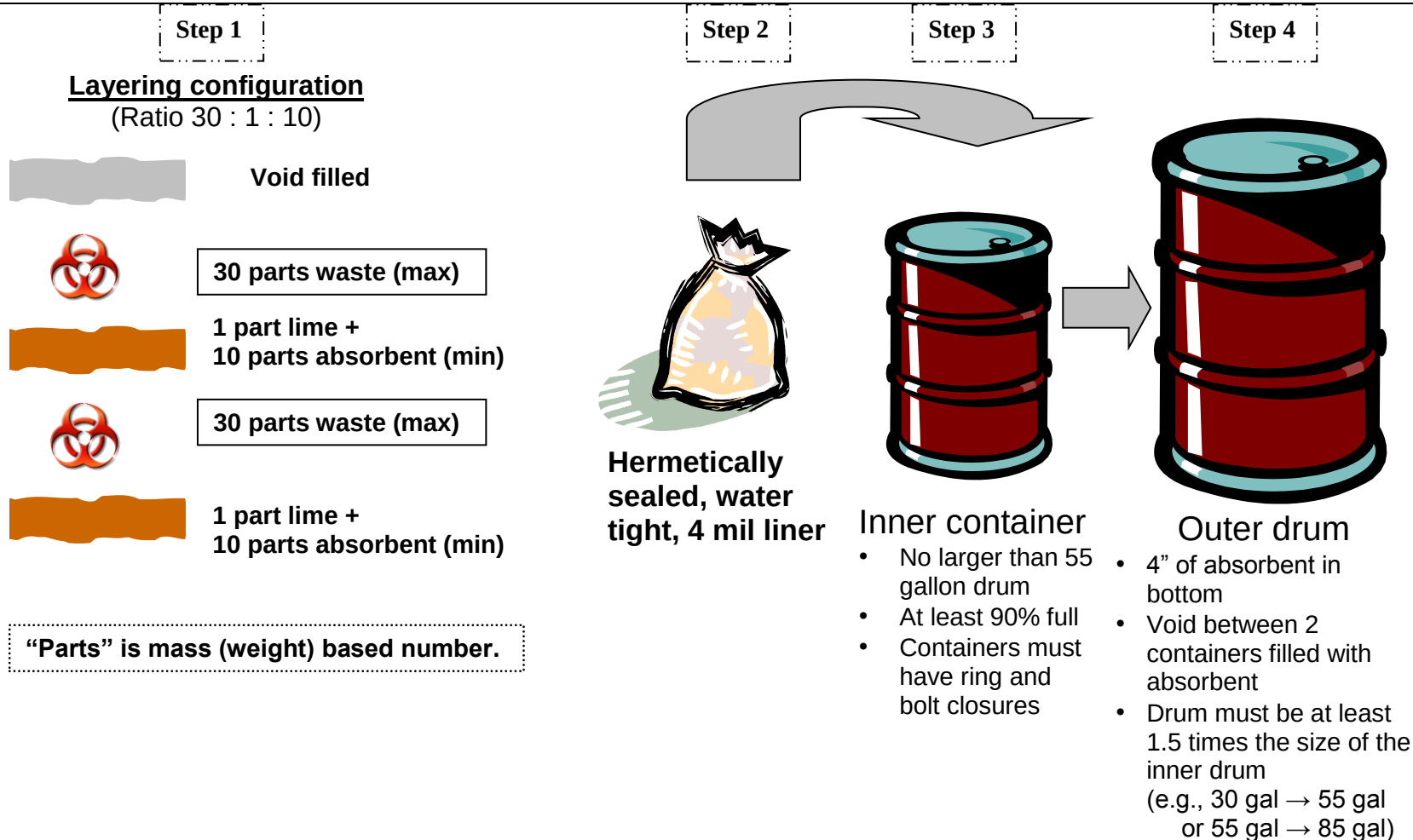


Table 14 – Customer Service Shipping Address Information

US Mail	FedEx	Courier or UPS
Customer Service Waste Control Specialists LLC PO Box 1129 Andrews, TX 79714 (888) 789-2783	Customer Service Waste Control Specialists LLC 9998 W State Hwy 176 Eunice, NM 88231 (888) 789-2783	Customer Service Waste Control Specialists LLC 9998 W State Hwy 176 Andrews, TX 79714 (888) 789-2783

16.0 APPENDIX 1 – 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





NRC FORM 540 (01-2014)		U.S. NUCLEAR REGULATORY COMMISSION UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST SHIPPING PAPER		5. SHIPPER - NAME AND FACILITY		7. NRC FORM 540 AND 540A Generator Certification #		8. MANIFEST NUMBER (Use this number on all continuation pages)	
1. EMERGENCY TELEPHONE NUMBER		Optional - Enter DSHS Shipper Registration Number		USER PERMIT NUMBER Wxxxx		SHIPMENT NUMBER SR-xxxx-xxxx		NRC FORM 541 AND 541A PAGE(S) _____ NRC FORM 542 AND 542A PAGE(S) _____ ADDITIONAL INFORMATION PAGE(S) _____	
2. IS THIS AN "EXCLUSIVE USE" SHIPMENT?				CONTACT _____		TELEPHONE NUMBER (Include Area Code)		9. CONSIGNEE - Name and Facility Address Waste Control Specialists LLC TSD Facility 9998 W. State Hwy 176 Andrews, TX 79714	
3. TOTAL NUMBER OF PACKAGES IDENTIFIED ON THIS MANIFEST =====➡		Optional - Enter ELITE Shipment #		If a CWF- or FWF-certified generator, enter the 9-character Generator Certification number assigned by WCS		SIGNATURE - Authorized consignee acknowledging waste receipt _____		DATE _____	
4. DOES EPA REGULATED WASTE REQUIRING A MANIFEST ACCOMPANY THIS SHIPMENT? If "Yes," provide Manifest Number		EPA MANIFEST NUMBER _____		SIGNATURE - Authorized carrier acknowledging waste receipt _____		DATE _____		10. CERTIFICATION This is to certify that the herein-named materials are acceptable for disposal, are properly classified, described, packaged, marked, and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation and the Commission.	
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		15. INDIVIDUAL RADIONUCLIDES	
UN2916, Radioactive material, Type B(U) Package, 7, Fissile Excepted, RQ-Radionuclides (WP-019XXX)									
Enter WCS-assigned Waste Profile Number after Proper Shipping Name								Enter Consignee Data as shown	

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Storage and Processing Facility Generator Handbook

FORM 542		Waste Control Specialists LLC		1. WASTE COLLECTOR/PROCESSOR						2. MANIFEST NUMBER		
UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST				NAME						3. PAGE OF PAGE(S)		
MANIFEST INDEX AND REGIONAL COMPACT TABULATION				IDENTIFICATION NUMBER								
List all original "PROCESSED WASTE" generators (if any) before "COLLECTED WASTE" generators.				SHIPPING DATE								
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)	8. MANIFEST NUMBER(S) UNDER WHICH WASTE (OR MATERIAL) RECEIVED AND DATE OF RECEIPT	9. WASTE CODE P = PROCESSED C = COLLECTED	10. ORIG COI RE OR	COLLECTED TOTAL		D. VOLUME (m3)	E. WEIGHT (tons)	F. MAXIMUM PACKAGE RADIATION LEVEL (mrem/hr)
TOTALS OF ALL PAGES (FORMS 542 AND 542A)												

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

Revision 1

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number	
5. Generator's Name and Mailing Address		Generator's Site Address (if different than mailing address)				
Generator's Phone:						
6. Transporter 1 Company Name		U.S. EPA ID Number				
7. Transporter 2 Company Name		U.S. EPA ID Number				
8. Designated Facility Name and Site Address Waste Control Specialists LLC TSD Facility 9998 W. State Hwy 176 Andrews, TX 79714 Facility's Phone: (432) 525-8500		U.S. EPA ID Number TXD988088464				
9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, and Packing Group (if any))	Enter Designated Facility data as shown			12. Unit Wt/Vol.	13. Waste Codes
14. Special Handling Instructions and Additional Information WP-xxxxxx ERG #xxx		If space is available, enter Texas' 8-character waste code from profile in two adjacent blocks, in addition to EPA codes				
15. Enter Waste Profile Number(s) and ERG Number(s) if applicable. Also enter equipment numbers for rail shipments and stenciled numbers for intermodal boxes & roll offs.						
16. ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit: Date leaving U.S.:						
Transporter signature (for exports only):						
17. Transporter Acknowledgment of Receipt of Materials						
Transporter 1 Printed/Typed Name		Signature		Month Day Year		
Transporter 2 Printed/Typed Name		Signature		Month Day Year		
18. Discrepancy						
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection						
Manifest Reference Number:						
18b. Alternate Facility (or Generator)		U.S. EPA ID Number				
Facility's Phone:						
18c. Signature of Alternate Facility (or Generator)						
Month Day Year						
19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)						
1.		2.		3.		
4.						
20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a						
Printed/Typed Name		Signature		Month Day Year		

18.0 APPENDIX 3 – WCS MINIMUM WASTE VERIFICATION REQUIREMENTS

Waste verification is completed on a “per waste profile, per shipment” basis unless otherwise noted. If a discrepancy in the waste is identified, any inspection frequency may be increased up to 100% at WCS’ discretion prior to generator notification.

		Non-radiological		Exempt Radioactive (Exempt by Rule)		Licensed Radioactive (Exempt by LC 192)		Licensed Radioactive	
		Non-Debris	Debris	Non-Debris	Debris	Non-Debris	Debris	Non-Debris and Debris	
Exterior Visual Inspection for container integrity and consistent labeling ¹		100%		100%		100%		100%	
Waste Quantity Verification (Each container weighed except shielded shipments)	Bulk Loads	Net weight within 10%		Net weight within 10%		Net weight within 10%		Net weight within 10% ²	
	Containerized Waste	Exact piece count		Exact piece count		Exact piece count		Exact piece count	
Intrusive Visual Inspection ^{1, 3}	Bulk Loads	100%	100%	100%	100%	100%	100%	Waived ⁴	
	Containerized Waste ⁵	10%	10%	10%	10%	10%	10%		
Fingerprint Analysis	Bulk Loads	100%	Waived	100%	Waived	100%	Waived		
	Bulk Loads – Large Profile Campaign ⁶	10%	Waived	10%	Waived	10%	Waived		
	Containerized Waste ⁷	10%	Waived	10%	Waived	10%	Waived		
LC 192 Radiological Homogeneity Verification						10%			
LC 192 Isotopic Measurements and Sampling ⁸	Tier 1 ⁹					Every 10 th container			
	Tier 2 ¹⁰					First 6 containers then every 10 th container			
	Tier 3					100%, unless Tier1 waste, but Tier 3 for DU then every 10 th container			
LC 206 Special Nuclear Material Verification Sampling and Analysis						Once per 600 kg if concentrations are above 1/10 th the limits of LC 206.A.1 ¹¹			
External Radiological Analysis prior to CWF or FWF Disposal	Containerized Soil							Waived	
	Containerized Debris							10%	
	High Dose Rate							10%	
	Cask Waste							100%	

¹ Within sound ALARA practices

² Wastes in shipping casks or shielded configurations are not usually directly weighed, and managed on a piece count basis.

³ Exceptions are permitted for certain wastes in accordance with the Waste Analysis Plan

⁴ For wastes stored at the TSDF prior to CWF or FWF Disposal, refer to Section 2.30 and CWF or FWF facility-specific requirements

⁵ Containerized waste that must be disposed intact due to health and safety concerns (e.g., drums of biological waste, beryllium, asbestos, etc.) must be at least 90% full

⁶ Any bulk load that visually differs from previous containers in the waste profile will be sampled and analyzed

⁷ Container samples from the same profile may be composited prior to fingerprint analysis, providing the individual samples are visually similar

⁸ All other containers not sampled are subject to “Dose to Curie” or other approved verification techniques

⁹ Tier 1 Containerized Shipments: a minimum of at least one sample for every individual conveyance received

¹⁰ Tier 2 Containerized Shipments: a minimum of at least one sample for every individual conveyance received

¹¹ This confirmatory testing is on a “per waste profile” basis and is not required for waste to be disposed of at the Waste Isolation Pilot Project facility located near Carlsbad, NM



19.0 APPENDIX 4 – EXAMPLE WCS FORMS

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19.1 TSDF Waste Transporter Requirements

In an effort to improve communications between WCS and clients delivering waste to our Subtitle C Landfill and facility, WCS is taking this opportunity to provide a list of transportation requirements:

Advance Documentation

- Transporters must have a twelve (12) character Environmental Protection Agency (EPA) ID number.
- Transporters must have a five (5) digit Texas Commission on Environmental Quality (TCEQ) Industrial and Hazardous Waste Solid Waste Registration (SWR) number to transport hazardous and industrial waste (Classes 1, 2 and 3) in and through the State of Texas.
- Asbestos transporters must have a license from the Texas Department of State Health Services (DSHS).
- All transporters are obligated to meet standard insurance requirements set forth by WCS. The requirements are in the client's Environmental Service Agreement.
- Following profile approval, a shipment request and advance draft manifest shall be submitted at least five business days before arrival. Waste arriving without shipment approval may be subject to rejection or surcharge.

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. These provisions can be found at <http://www.statutes.legis.state.tx.us/docs/PE/htm/PE.46.htm>. 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, Subpart 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.

Upon Arrival at the WCS Facility

- The Guard House is open 24 hours per day, 7 days per week. The phone number is (432) 525-8800.
- WCS offers no services or food for drivers and transporters are encouraged to use truck stops in the area instead of remaining overnight at WCS.
- Upon arrival, drivers must report to the Guard House 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 Guard House.
- 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 by WCS staff.

Site Access

- 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.

- Drivers entering the site must have in their possession a current CDL with a hazardous material endorsement.
- Drivers transporting waste into the Subtitle C Landfill or to a treatment building must have in their possession proof of current 24- or 40-hour HAZWOPER training, per 29 CFR §1910. Drivers offloading containerized waste at the Drum Dock or LSA Pad do not require HAZWOPER training.
- 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.

Waste Containers

- All containers used to transport waste to WCS site must meet DOT criteria specific to the waste. Containers must be of suitable integrity to safely contain, transport and be unloaded without harm to human health, the environment, conveyance or WCS property.
 - For example, all bin rollers are to be intact and be able to roll or move without binding or hanging up.
- Roll-off bins and intermodals must be suitably lined. Unlined bins and intermodals may be subject to a surcharge.
- Heavy or dense materials should be broken down into pieces smaller than 3'x3'x2' with a maximum weight of 1000 pounds each. Exceptions can be addressed on a case-by-case basis through the waste profile and shipment request forms.
- Waste transported to the site for direct landfill or placement in a treatment building by a driver without proof of current HAZWOPER can be trans-loaded to a WCS truck and transported to the Subtitle C Landfill for disposal. This may be subject to a surcharge, and WCS shall not be responsible for bin damage during the loading/unloading process. WCS shall not provide trans-loading services for materials/containers with a gross weight exceeding 40,000 pounds
- Wastes scheduled for direct disposal in the Subtitle C Landfill must not contain free or containerized liquids, such as partially filled beverage containers.

If you have any questions regarding transportation requirements, please call Customer Service at 888-789-2783.

I understand these requirements and shall comply with them for each shipment sent to WCS.

Printed Name

Signature

Title

Date

Company Name

Profile Number(s)

(As it appears on your insurance certificate)

☐ Generator

☐ Broker

☐ Transporter

Please submit this completed page via email or fax to your Customer Service Representative.

19.2 Waste 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.

Please fax to 432-525-8904 or submit by email to your customer service contact.

19.3 Lab Pack Inventory- Example

				Page	of
Generator:				Waste Profile Number:	
DOT Proper Shipping Name:				Manifest Number:	
Additional Description:				Container Number:	
Packaging Medium:		Container Type:		Accumulation Date:	
DOT Labels:		Container Size:		Date Packaged:	

Item	Description All Items must be 100% identified with all components listed	Solid Liquid or Gas	QTY	DOT Hazard	DOT Sub Hazard Class	Packing Group	Land Disposal Restriction Notification Information				Gross Weight (pounds)	Container Size (ft ³)
							EPA Hazardous Waste Codes	Sub- category	UHCs	WW NWW		
1												
2												
3												
4												
5												

☐ Certification- For lab packs to be incinerated. I certify under penalty of law that I personally have examined and am familiar with the waste and that the lab pack contains only waste that have not been excluded under appendix IV to 40 CFR §Part 268 and that this lab pack will be sent to a combustion facility in compliance with the alternate treatment standards for lab packs at 40 CFR §268.42. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine or imprisonment.

☐ Certification- Lab pack for retort of mercury. The waste in this lab pack contains mercury compounds in excess of 260 ppm total and must be retorted

☐ Certification- Lab pack for treatment/disposal at WCS. The waste in this lab pack does not contain Volatile Organic Compounds in excess of 85 ppm and can be treated by means other than combustion or mercury retort.

Signature

Printed Name and Title

Date

[illegible]

19.4 Key to Multiple Line Manifests-Example

Page ____ of ____							
Generator:					Manifest Number:		
All shipments received by WCS must be properly labeled and marked according to all DOT, TSCA, TCEQ, NRC, and RCRA regulations. In addition, WCS requests that the following information be placed on all containers, including non-hazardous waste:							
Generator of waste		Manifest document number associated with container			Generator's unique container ID number		
WCS Profile number associated with container		Line item of manifest associated with container					
Manifest Line Item	Generator's Unique ID #	EPA Hazardous Waste Codes	Underlying Hazardous Constituents	Size of Container	Gross Weight (pounds)	Net Weight (pounds)	ERG Number

One time notification ☐ yes ☐ no

One time notification: ☐ yes ☐ no		Page 1 of 2
Generator Name:		Manifest #:

[illegible]

1. Acetone	11. 1,1,2-Trichloro-1,2,2-trifluoroethane	21. Ethyl Benzene
2. Chlorobenzene	12. Cyclohexanone	22. Methyl Ethyl Ketone
3. Isobutyl Alcohol	13. n-Butyl Alcohol	23. Toluene
4. Nitrobenzene	14. m-Cresol	24. Trichloromonofluoromethane
5. 1,1,2-Trichloroethane	15. Ethyl Acetate	25. Carbon Tetrachloride
6. Benzene	16. Methylene Chloride	26. Mixed Cresols
7. o-Cresol	17. Tetrachloroethylene	27. Ethyl Ether
8. o-Dichlorobenzene	18. Trichloroethylene	28. Methyl Isobutyl Ketone
9. Methanol	19. Carbon Disulfide	29. 1,1,1-Trichloroethane
10. Pyridine	20. p-Cresol	30. Mixed Xylene

1b. Is the waste an F001-F005 solvent containing only one or more of the following:
carbon disulfide, cyclohexanone, methanol ☐ Yes ☐ No ☐ N/A

3. Is the waste subject to the alternate treatment standards for hazardous debris ☐ Yes ☐ No.
If yes, does the waste contain D001 or D003 ☐ Yes ☐ No

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☐ Waste or soil meeting treatment standards at the point of generation. I certify under penalty of law that I personally have examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this certification that the waste complies with the treatment standards specified in 40 CFR §part 268 subpart D. I believe that the information I submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment.	Applies to line items: _____ <i>Reference:</i> 268.7(a)(3)(i)	
☐ Treatment residuals meeting treatment standards. I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification. Based on my inquiry of those individuals immediately responsible for obtaining this information, I believe that the treatment process has been operated and maintained properly so as to comply with the treatment standards specified in 40 CFR §268.40 without impermissible dilution of the prohibited waste. I am aware there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment.	Applies to line items: _____ <i>Reference:</i> 268.7(b)(4)	
☐ Contaminated soil that has been treated to meet treatment standards. I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification and believe that it has been maintained and operated properly so as to comply with treatment standards specified in 40 CFR §268.49 without impermissible dilution of the prohibited wastes. I am aware there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment.	Applies to line items: _____ <i>Reference:</i> 268.7(a)(3)(i)	
☐ Organic wastes that have been treated to a concentration level in order to meet a treatment standard. I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification. Based on my inquiry of those individuals immediately responsible for obtaining this information, I believe that the nonwaste water organic constituents have been treated by combustion units as specified in 268.42, Table 1. I have been unable to detect the nonwaste water organic constituents, despite having used best good-faith efforts to analyze for such constituents. I am aware there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment.	Applies to manifest line items: _____ <i>Reference:</i> 268.7(b)(4)(iii)	
☐ Waste that has been treated to remove a characteristic but still contains UHCs. I certify under penalty of law that the waste has been treated in accordance with the requirements of 40 CFR §268.40 or 268.49 to remove the hazardous characteristic. This decharacterized waste contains underlying hazardous constituents that require further treatment to meet treatment standards. I am aware there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment.	Applies to line items: _____ <i>Reference:</i> 268.7(b)(4)(iv)	
☐ Waste that has been treated to remove a characteristic and meets UHC standards. I certify under penalty of law that the waste has been treated in accordance with the requirements of 40 CFR §268.40 to remove the hazardous characteristic and that underlying hazardous constituents, as defined in §268.2(i) have been treated on-site to meet the §268.48 Universal Treatment Standards. I am aware there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment.	Applies to line items: _____ <i>Reference:</i> 268.7(b)(4)(v)	
☐ Debris that has been treated to meet the alternate treatment standards for debris. I certify under penalty of law that the debris has been treated in accordance with the requirements of 40 CFR §268.45. I am aware there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment. <i>Note: If the waste treatment was an extraction or destruction technology provided by Table 1, 40 CFR §268.45, complete notification per 268.7(d)(1)</i>	Applies to line items: _____ <i>Reference:</i> 268.7(d)(3)(iii)	
☐ Waste that requires treatment. The waste(s) listed on this document require treatment as specified in 40 CFR §268.40 or 268.45 prior to disposal.	Applies to line items: _____	
☐ Soil Certification Statement: I certify under penalty of law that I personally have examined this contaminated soil and it ☐ does/ ☐ does not contain listed hazardous waste and ☐ does/ ☐ does not exhibit a characteristic of hazardous waste and ☐ is subject to (requires treatment) / ☐ complies with the soil treatment standards as provided by 268.49(c) or the Universal Treatment Standards.		
WCS reserves the right to properly manage waste as received, i.e., debris.		
Generator's Signature	Printed/Typed Name & Title	Date

19.6 PCB Continuation Sheet- Example

Generator:					Manifest Number:			
Generator Address:					Destination:		Waste Control Specialists LLC 9998 W State Hwy 176 Andrews, TX 79714 (888) 789-2783	
Generator EPA ID#:								
Manifest Line Item	Indicate the Type of PCB (Bulk, Article Container, Article or Container)	Describe the Waste (i.e., soil and debris)	Date Removed From Service	Date Transported	Gross Weight (kilograms)	Net Weight (pounds)	Waste Profile Number	

19.7 Asbestos Record of Shipment- Example

Work Site Name and Mailing Address				
Operator's Name, Mailing Address and Telephone Number		Owner's Name, Mailing Address and Telephone Number		
Waste Disposal Site Name, Mailing Address and Physical Address Waste Control Specialists LLC PO Box 1129; 9998 W State Hwy 176 Andrews, TX 79714		Waste Disposal Site's Phone: 432-525-8500		
Responsible Agency Name and Mailing Address				
Description of Materials	Containers		Volume	
	Number	Type	Quantity	Units Must be Cubic Meters
Special Handling Instructions and Additional Information				
OPERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.				
Operator's Printed/Type Name & Title	Operator's Signature		Month	Day
TRANSPORTER 1: Acknowledgement of Receipt of Materials				
Transporter 1 Printed/Type Name	Transporter 1 Signature		Month	Day
Transporter 1 Address	Transporter 1 Telephone Number			
TRANSPORTER 2: Acknowledgement of Receipt of Materials				
Transporter 2 Printed/Type Name	Transporter 2 Signature		Month	Day
Transporter 2 Address	Transporter 2 Telephone Number			
DISCREPANCY INDICATION SPACE				
WASTE DISPOSAL SITE OWNER OR OPERATOR: Certification of receipt of asbestos materials covered by this waste shipment record except as noted in the discrepancy indication space				
Waste Disposal Site Owner or Operator Printed/Type Name	Waste Disposal Site Owner or Operator Signature		Month	Day

20.0 APPENDIX 5 – RADIOACTIVE SUBSTANCES PROCESSING AND STORAGE CATEGORIES OF RADIONUCLIDES

Table 15 – 30 TAC §336.1231(a)

Element*	Radionuclide**	Category
Actinium (89)	Ac-227	I
	Ac-228	I
Americium (95)	Am-241	I
	Am-243	I
Antimony (51)	Sb-122	IV
	Sb-124	III
	Sb-125	III
Argon (18)	Ar-37	VI
	Ar-41	II
	Ar-41 (uncompressed)†	V
Arsenic (33)	As-73	IV
	As-74	IV
	As-76	IV
	As-77	IV
Astatine (85)	At-211	III
Barium (56)	Ba-131	IV
	Ba-133	II
	Ba-140	III
Berkelium (97)	Bk-249	I
Beryllium (4)	Be-7	IV
Bismuth (83)	Bi-206	IV
	Bi-207	III
	Bi-210	II
	Bi-212	III
Bromine (35)	Br-82	IV
Cadmium (48)	Cd-109	IV
	Cd-115m	III
	Cd-115	IV
Calcium (20)	Ca-45	IV
	Ca-47	IV

Element*	Radionuclide**	Category
Californium (98)	Cf-249	I
	Cf-250	I
	Cf-252	I
Carbon (6)	C-14	IV
Cerium (58)	Ce-141	IV
	Ce-143	IV
	Ce-144	III
Cesium (55)	Cs-131	IV
	Cs-134m	III
	Cs-134	III
	Cs-135	IV
	Cs-136	IV
Chlorine (17)	Cl-36	III
	Cl-38	IV
Chromium (24)	Cr-51	IV
Cobalt (27)	Co-56	III
	Co-57	IV
	Co-58m	IV
	Co-58	IV
	Co-60	III
Copper (29)	Cu-64	IV
Curium (96)	Cm-242	I
	Cm-243	I
	Cm-244	I
	Cm-245	I
	Cm-246	I
Dysprosium (66)	Dy-154	III
	Dy-165	IV
	Dy-166	IV
Erbium (68)	Er-169	IV
	Er-171	IV

Element*	Radionuclide**	Category
Europium (63)	Eu-150	III
	Eu-152m	IV
	Eu-152	III
	Eu-154	II
	Eu-155	IV
Fluorine (9)	F-18	IV
Gadolinium (64)	Gd-153	IV
	Gd-159	IV
Galium (31)	Ga-67	III
	Ga-72	IV
Germanium (32)	Ge-71	IV
Gold (79)	Au-193	III
	Au-194	III
	Au-195	III
	Au-196	IV
	Au-198	IV
	Au-199	IV
Hafnium (72)	Hf-181	IV
Holmium (67)	Ho-166	IV
Hydrogen (1)	H-3 (see tritium)	
Indium (49)	In-113m	IV
	In-114m	III
	In-115m	IV
	In-115	IV
Iodine (53)	I-124	III
	I-125	III
	I-126	III
	I-129	III
	I-131	III
	I-132	IV
	I-133	III
	I-134	IV
	I-135	IV
Iridium (77)	Ir-190	IV
	Ir-192	III
	Ir-194	IV
Iron (26)	Fe-55	IV
	Fe-59	IV

Element*	Radionuclide**	Category
Krypton (36)	Kr-85m	III
	Kr-85m (uncompressed)†	V
	Kr-85	III
	Kr-85 (uncompressed)†	VI
	Kr-87	II
	Kr-87 (uncompressed)†	V
Lanthanum (57)	La-140	IV
Lead (82)	Pb-203	IV
	Pb-210	II
	Pb-212	II
Lutetium (71)	Lu-172	III
	Lu-177	IV
Magnesium (12)	Mg-28	III
Manganese (25)	Mn-52	IV
	Mn-54	IV
	Mn-56	IV
Mercury (80)	Hg-197m	IV
	Hg-197	IV
	Hg-203	IV
Mixed fission products (MFP)		II
Molybdenum (42)	Mo-99	IV
Neodymium (60)	Nd-147	IV
	Nd-149	IV
Neptunium (93)	Np-237	I
	Np-239	I
Nickel (28)	Ni-56	III
	Ni-59	IV
	Ni-63	IV
	Ni-65	IV
Niobium (41)	Nb-93m	IV
	Nb-95	IV
	Nb-97	IV
Osmium (76)	Os-185	IV
	Os-191m	IV
	Os-191	IV
	Os-193	IV

Element*	Radionuclide**	Category
Palladium (46)	Pd-103 Pd-109	IV IV
Phosphorus (15)	P-32	IV
Platinum (73)	Pt-191 Pt-193 Pt-193m Pt-197m Pt-197	IV IV IV IV IV
Plutonium (94)	Pu-238 F Pu-239 F Pu-240 Pu-241 F Pu-242	I I I I I
Polonium (84)	Po-210	I
Potassium (19)	K-42 K-43	IV III
Praseodymium (59)	Pr-142 Pr-143	IV IV
Promethium (61)	Pm-147 Pm-149	IV IV
Protactinium (91)	Pa-230 Pa-231 Pa-233	I I II
Radium (88)	Ra-223 Ra-224 Ra-226 Ra-228	II II I I
Radon (86)	Rn-220 Rn-222	IV II
Rhenium (75)	Re-183 Re-186 Re-187 Re-188 Re-Natural	IV IV IV IV IV
Rhodium (45)	Rh-103m Rh-105	IV IV

Element*	Radionuclide**	Category
Rubidium (37)	Rb-86 Rb-87 Rb-Natural	IV IV IV
Ruthenium (44)	Ru-97 Ru-103 Ru-105 Ru-106	IV IV IV III
Samarium (62)	Sm-145 Sm-147 Sm-151 Sm-153	III III IV IV
Scandium (21)	Sc-46 Sc-47 Sc-48	III IV IV
Selenium (34)	Se-75	IV
Silicon (14)	Si-31	IV
Silver (47)	Ag-105 Ag-110m Ag-111	IV III IV
Sodium (11)	Na-22 Na-24	III IV
Strontium (38)	Sr-85m Sr-85 Sr-89 Sr-90 Sr-91 Sr-92	IV IV III II III IV
Sulfur (16)	S-35	IV
Tantalum (73)	Ta-182	III
Technetium (43)	Tc-96m Tc-96 Tc-97m Tc-97 Tc-99m Tc-99	IV IV IV IV IV IV

Element*	Radionuclide**	Category
Tellurium (52)	Te-125m	IV
	Te-127m	IV
	Te-127	IV
	Te-129m	III
	Te-129	IV
	Te-131m	III
	Te-132	IV
Terbium (65)	Tb-160	III
Thallium (81)	Tl-200	IV
	Tl-201	IV
	Tl-202	IV
	Tl-204	III
Thorium (90)	Th-227	II
	Th-228	I
	Th-230	I
	Th-231	I
	Th-232	III
	Th-234	II
	Th-Natural	III
Thulium (69)	Tm-168	III
	Tm-170	III
	Tm-171	IV
Tin (50)	Sn-113	IV
	Sn-117m	III
	Sn-121	III
	Sn-125	IV
Tritium (1)	H-3	IV
	H-3 (as a gas, as luminous paint, or adsorbed on solid material.)	VII
Tungsten (74)	W-181	IV
	W-185	IV
	W-187	IV

Element*	Radionuclide**	Category
Uranium (92)	U-230	II
	U-232	I
	U-233 F	II
	U-234	II
	U-235 F	III
	U-236	II
	U-238	III
	U-Natural	III
	U-Enriched F	III
	U-Depleted	III
Vanadium (23)	V-48	IV
	V-49	III
Xenon (54)	Xe-125	III
	Xe-131m	III
	Xe-131m (uncompressed)†	V
	Xe-133	III
	Xe-133 (uncompressed)†	VI
	Xe-135	II
	Xe-135 (uncompressed)†	V
Ytterbium (70)	Yb-175	IV
Yttrium (39)	Y-88	III
	Y-90	IV
	Y-91m	III
	Y-91	III
	Y-92	IV
Zinc (30)	Y-93	IV
	Zn-65	IV
	Zn-69m	IV
Zirconium (40)	Zn-69	IV
	Zr-93	IV
	Zr-95	III
	Zr-97	IV

NOTE: For mixtures of radionuclides and for radionuclides not included in this subsection, see Figure: 30 TAC §336.1231(b), waste processing and storage categories.

* Atomic number shown in parentheses.

** Atomic mass number shown after the element symbol.

F Fissile material.

m Metastable state.
† Uncompressed means at a pressure not exceeding 1 atmosphere.

Table 16 – 30 TAC §336.1231(b)

RADIOACTIVE HALF-LIFE			
Radionuclide	0 to 1000 days	1000 days to 10 ⁶ years	Over 10 ⁶ years
Atomic No. 1-81	Category III	Category II	Category III
Atomic No. 82 and over	Category I	Category I	Category III

21.0 REFERENCES

- 10 CFR §20, *Standards for Protection Against Radiation*
 10 CFR §40, *Domestic Licensing of Source Material*
 10 CFR §61, *Licensing Requirements for Land Disposal Of Radioactive Waste*
 10 CFR §70, *Domestic Licensing of Special Nuclear Material*
 10 CFR §71, *Packaging and Transportation of Radioactive Material*
 10 CFR §72, *Licensing Requirements for the Independent Storage of Spent Nuclear Fuel, High-Level Radioactive Waste, and Reactor-Related Greater Than Class C Waste*
 10 CFR §74, *Material Control and Accounting of Special Nuclear Material*
 10 CFR §75, *Safeguards on Nuclear Material – Implementation of US/IAEA Agreement*
 10 CFR §76, *Certification of Gaseous Diffusion Plants*
 10 CFR §150, *Exemptions and Continued Regulatory Authority in Agreement States and in Offshore Waters Under Section 274*
 29 CFR §1910, *Occupational Safety and Health Standards*
 40 CFR §61, *National Emission Standards for Hazardous Air Pollutants*
 40 CFR §260, *Hazardous Waste Management System; General*
 40 CFR §261, *Identification and Listing of Hazardous Waste*
 40 CFR §262, *Standards Applicable to Generators of Hazardous Waste*
 40 CFR §263, *Standards Applicable to Transporters of Hazardous Waste*
 40 CFR §264, *Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities*
 40 CFR §265 *Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities*
 40 CFR §266, *Standards for the Management of Specific Hazardous Wastes and Specific Types Hazardous Waste Management Disposal Facilities*
 40 CFR §267, *Standards for Owners and Operators of Hazardous Waste Facilities Operating Under a Standardized Permit*
 40 CFR §268, *Land Disposal Restrictions*
 40 CFR §761, *Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions*
 40 CFR §763, *Asbestos*
 49 CFR, *Transportation*
 49 CFR §172, *Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, Training Requirements, and Security Plans*
 49 CFR §173, *Shippers – General Requirements for Shipments and Packagings*
 49 CFR §177, *Carriage by Public Highway*
 6 NYCRR §371, *Identification and Listing of Hazardous Wastes*
 25 TAC §289, *Radiation Control*
 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](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 §330, *Municipal Solid Waste*
 30 TAC §335, *Industrial Solid Waste and Municipal Hazardous Waste*
 30 TAC §336, *Radioactive Substance Rules*
 DOE Order 460.1C, *Packaging and Transportation Safety*, <https://www.directives.doe.gov/directives/0460.1-BOrder-c/view>
 EPA Form 8700-22, *Uniform Hazardous Waste Manifest*
 EPA Form 8700-22A, *Uniform Hazardous Waste Manifest (Continuation Sheet)*
 EPA, *Instructions to Complete a Uniform Hazardous Waste Manifest and Sample Uniform Hazardous Waste Manifest*,
<http://www.epa.gov/wastes/hazard/transportation/manifest/pdf/man-inst.pdf>
 IATA, *Dangerous Goods Regulations*
 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>

NRC Form 741A, *Nuclear Material Transaction Report (Continuation)*

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

NRC, 1995, *Branch Technical Position on Concentration Averaging and Encapsulation*, <http://pbadupws.nrc.gov/docs/ML0336/ML033630732.pdf>

NRC, 1974, Regulatory Guide 1.86, *Termination of Operating Licenses for Nuclear Reactors* <http://www.nrc.gov/reading-rm/doc-collections/reg-guides/power-reactors/rg/01-086/01-086.pdf>

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

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

TCEQ, 2005, Publication RG-022, *Guidelines for the Classification and Coding of Industrial and Hazardous Wastes* <http://www.tceq.texas.gov/publications/rg/rg-022.html>

TCEQ, 2010, Publication RG-486, *Disposal of Exempt Waste That Contains Radioactive Material* <http://tceq.net/publications/rg/rg-486.html>

TCEQ, 2012, Publication SFR-104, *Capacity Report for Low-level Radioactive Waste* http://www.tceq.state.tx.us/assets/public/comm_exec/pubs/sfr/104.pdf

TCEQ, 2014, Publication RG-086, *Transporting Waste in Texas – A Guide to Regulations* <http://www.tceq.texas.gov/publications/rg/rg-086.html>

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.

TCEQ Radioactive Materials License Number R04100

Texas Health and Safety Code Chapter 401, *Radioactive Materials and Other Sources of Radiation*

Texas Labor Code Chapter 52, Subchapter G, *Restrictions on Prohibiting Certain Firearms or Ammunition*

Texas Penal Code Chapter 46, *Weapons*

WCS *Waste Acceptance Plan*, Appendix 5.2-1 of Application for License to Authorize Near Surface Land Disposal of Low-Level Radioactive Waste

WCS Form AL-2.1.1-2, *Chain of Custody Record for Samples for Pre-Acceptance Samples*

WCS Form WA-1.0-1, *Waste Profile Sheet*

WCS Form WA-2.0-1, *Inbound – Waste Shipment Request*

WCS Procedure OP-1.2.22, *SNM Exemption*

WCS Procedure RS-3.2.5, *Release of Items from the Controlled Areas and the Facility*

WCS Procedure RS-5.0.0, *Exemption Process for the RCRA Landfill*