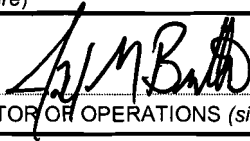



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SNM EXEMPTION			

PROCEDURE APPROVALS:		
Lisa Berta		6/6/11
TECHNICAL SERVICES PROJECT MANAGER (printed name)	TECHNICAL SERVICES PROJECT MANAGER (signature)	DATE
Ryan Williams		
DIRECTOR OF INTEGRATION & CUSTOMER SERVICES (printed name)	DIRECTOR OF INTEGRATION & CUSTOMER SERVICES (signature)	DATE
Jay Britten		6/6/11
DIRECTOR OF OPERATIONS (printed name)	DIRECTOR OF OPERATIONS (signature)	DATE
Sheila Parker		6-6-11
DIRECTOR OF ENVIRONMENT	DIRECTOR OF ENVIRONMENT (signature)	
Charles Taylor		6/6/11
DIRECTOR OF HEALTH, SAFETY, & SECURITY	DIRECTOR OF HEALTH, SAFETY, & SECURITY (signature)	
Scott Kirk		6/6/11
RSO/RADIATION SAFETY DIRECTOR (printed name)	RSO/RADIATION SAFETY DIRECTOR (signature)	DATE
* INDICATES RSO HAS DETERMINED THAT ANY MODIFICATIONS RESULTING FROM USE OF THIS SOP WILL PROVIDE LEVELS OF RADIATION SAFETY AND ADMINISTRATIVE CONTROLS THAT ARE AT LEAST EQUIVALENT TO THOSE APPROVED BY THE RESPECTIVE REGULATORY AUTHORITIES.		
Jeff Shouse		6/6/11
QUALITY ASSURANCE MANAGER (printed name)	QUALITY ASSURANCE MANAGER (signature)	DATE
Linda Beach		6/6/11
VP/GENERAL MANAGER (printed name)	VP/GENERAL MANAGER (signature)	DATE


1.0 PURPOSE AND SCOPE

- 1.1 This procedure describes the waste acceptance requirements for Special Nuclear Material (SNM), and sampling and documentation requirements for the waste generator and for Waste Control Specialists LLC (WCS). The procedure lists concentration limits for SNM and the sampling frequency required for characterizing the shipments of various concentrations of SNM.
- 1.2 This procedure implements license conditions in the WCS Radioactive Materials License No. R04971 issued by the Texas Commission on Environmental Quality (TCEQ).

2.0 DEFINITIONS

- 2.1 Special Nuclear Material (SNM): Defined by Title I of the Atomic Energy Act of 1954 as plutonium, uranium-233, or uranium enriched in the isotopes uranium-233 or uranium-235. For this procedure and based upon license R04971 requirements, the only plutonium defined as SNM will be plutonium-239 and -241. The definition includes any other material that the Nuclear Regulatory Commission (NRC) determines to be special nuclear material, but does not include source material.

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		Revision 9	Page 1 of 14
SNM EXEMPTION			

PROCEDURE APPROVALS:		
Lisa Berta		
TECHNICAL SERVICES PROJECT MANAGER (<i>printed name</i>)	TECHNICAL SERVICES PROJECT MANAGER (<i>signature</i>)	DATE
Ryan Williams		6/6/11
DIRECTOR OF INTEGRATION & CUSTOMER SERVICES (<i>printed name</i>)	DIRECTOR OF INTEGRATION & CUSTOMER SERVICES (<i>signature</i>)	DATE
Jay Britten		
DIRECTOR OF OPERATIONS (<i>printed name</i>)	DIRECTOR OF OPERATIONS (<i>signature</i>)	DATE
Sheila Parker		
DIRECTOR OF ENVIRONMENT	DIRECTOR OF ENVIRONMENT (<i>signature</i>)	
Charles Taylor		
DIRECTOR OF HEALTH, SAFETY, & SECURITY	DIRECTOR OF HEALTH, SAFETY, & SECURITY (<i>signature</i>)	
Scott Kirk		
RSO/RADIATION SAFETY DIRECTOR (<i>printed name</i>)	RSO/RADIATION SAFETY DIRECTOR (<i>signature</i>)	DATE
<small>* INDICATES RSO HAS DETERMINED THAT ANY MODIFICATIONS RESULTING FROM USE OF THIS SOP WILL PROVIDE LEVELS OF RADIATION SAFETY AND ADMINISTRATIVE CONTROLS THAT ARE AT LEAST EQUIVALENT TO THOSE APPROVED BY THE RESPECTIVE REGULATORY AUTHORITIES.</small>		
Jeff Shouse		
QUALITY ASSURANCE MANAGER (<i>printed name</i>)	QUALITY ASSURANCE MANAGER (<i>signature</i>)	DATE
Linda Beach		
VP/GENERAL MANAGER (<i>printed name</i>)	VP/GENERAL MANAGER (<i>signature</i>)	DATE

1.0 PURPOSE AND SCOPE

- 1.1 This procedure describes the waste acceptance requirements for Special Nuclear Material (SNM), and sampling and documentation requirements for the waste generator and for Waste Control Specialists LLC (WCS). The procedure lists concentration limits for SNM and the sampling frequency required for characterizing the shipments of various concentrations of SNM.
- 1.2 This procedure implements license conditions in the WCS Radioactive Materials License No. R04971 issued by the Texas Commission on Environmental Quality (TCEQ).

2.0 DEFINITIONS

- 2.1 **Special Nuclear Material (SNM):** Defined by Title I of the Atomic Energy Act of 1954 as plutonium, uranium-233, or uranium enriched in the isotopes uranium-233 or uranium-235. For this procedure and based upon license R04971 requirements, the only plutonium defined as SNM will be plutonium-239 and -241. The definition includes any other material that the Nuclear Regulatory Commission (NRC) determines to be special nuclear material, but does not include source material.

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2.2 Special nuclear material of low strategic significance:

2.2.1 Less than 1000 grams of uranium-235 (contained in uranium enriched to 20 percent or more) in the U-235 isotope or less than 500 grams of uranium-233 or plutonium, or in a combined quantity of less than 1000 grams when computed by the equation grams = (grams contained U-235) + 2 (grams U-233 + grams plutonium), but more than 15 grams of uranium-235 (contained in uranium enriched to 20 percent or more in U- 235 isotope) or 15 grams of uranium-233 or 15 grams of plutonium or the combination of 15 grams when computed by the equation, grams = (grams contained U-235) + (grams plutonium) + (grams U-233); or

2.2.2 Less than 10,000 grams but more than 1,000 grams of uranium-235 (contained in uranium enriched to 10 percent or more but less than 20 percent in the U-235 isotope); or

2.2.3 10,000 grams or more of uranium-235 (contained in uranium enriched above natural but less than 10 percent in the U-235 isotope).

2.3 Homogeneity: A waste stream where the average specific activity is within a factor of 5 of the minimum and maximum specific activities for each SNM radionuclide present.

3.0 RESPONSIBILITIES

3.1 The Waste Generator is responsible for completing the SNM Exemption Certification Attachment 1, and for ensuring that sampling requirements and documentation provide a complete and accurate characterization of the SNM.

3.2 The Waste Acceptance Specialist (WAS) is responsible for the performance of this procedure and ensuring that all the requirements for receipt, sampling, and analysis are satisfied prior to processing SNM.

3.3 The Health Physicist (HP) is responsible for review and completion of:

3.3.1 OP-1.2.22 Attachment 2 Guidelines for Pre-acceptance Review of Shipments Containing Special Nuclear Material for the Purpose of Meeting the Exemption Under 10 CFR 70 (to be completed by WCS). Records will be retained for the life of the facility.

3.3.2 OP-1.2.22 Attachment 3 Guidelines for Final Acceptance Review of Shipments Containing Special Nuclear Material for the Purpose of Meeting the Exemption Under 10 CFR 70 (to be completed by WCS). Records will be retained for the life of the facility.

3.4 The Radiation Safety Officer (RSO) or designee is responsible for review and approval of the verification analysis and the WCS SNM acceptance checklist.

3.5 The Operations Department is responsible for performing sampling as required by this procedure.

4.0 PREREQUISITES, PRECAUTIONS AND LIMITATIONS

4.1 The requirements of this procedure must be satisfied for all SNM received and processed at WCS. This procedure does not apply to SNM received prior to the effective date of DSHS License Amendment 17 of January 10, 2002. SNM received on or after January 10, 2002 may be stored separately from SNM received prior to January 10, 2002.

4.2 The requirements of this procedure are in addition to the requirements of other WCS procedures for accepting waste.

4.3 In accordance with the License R04971, Condition 17.C, prior to receipt of transuranics with concentrations exceeding 100 nanocuries per gram, WCS will obtain an executed, written agreement from an authorized federal agency. The agreement shall meet the terms of the agreement specified in License R04971, Condition 15.B.

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- 4.4 Special Nuclear Material concentration limits specified in this procedure shall not be exceeded.
- 4.5 When more than one SNM radionuclide is present in the mixture, the sum of the ratios of each radionuclide to its limit shall not exceed 1.
- 4.6 Isotopes of uranium and isotopes of plutonium that are not listed in this procedure can be received in any concentration. There is no limiting concentration for the isotopes that are not listed (with regards to SNM exemption).
- 4.7 The License Limits for SNM are shown in Table 1 below. The license limits are in units of gram of SNM per gram of waste and are converted to activity concentration limit in (pCi/g).

NOTE

Maximum concentration (pCi/g) = Operational limit multiplied by the isotopic specific activity.

Table 1

Maximum Allowable Concentrations of SNM in Individual Waste Containers

SNM Isotope¹	Operational Limit (g SNM/g waste)	Maximum Concentration (pCi/g)	Maximum Measurement Uncertainty (g SNM/g waste)
U-233	4.7E-04	4.5E+06	7.1E-05
U-235 (10%) ²	9.9E-04	2.1E+03	1.5E-04
U-235 (100%) ³	6.2E-04	1.3E+03	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

¹For a mixture of SNM isotopes listed in this table, the sum-of-the-fractions rule applies.

²10 percent enrichment (U-235 mass enrichment, less than 10% enriched)

³100 percent enrichment (U-235 mass enrichment, more than 10% enriched)

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- 4.8 The mass concentration of carbon (C), fluorine (F), and bismuth (Bi) in the waste must be limited as follows:

Table 2

Maximum Allowable Mass Concentration of Carbon, Fluorine, and Bismuth

SNM Isotope	Carbon (C)	Fluorine (F)	Bismuth (Bi)
U-233	28 wt%	34 wt%	34 wt%
U-235 (10%) ¹	25 wt%	35 wt%	31 wt%
U-235 (100%) ²	41 wt%	42 wt%	33 wt%
Pu-239	43 wt%	43 wt%	34 wt%
Pu-241	37 wt%	39 wt%	32 wt%

¹ 10 percent enrichment (U-235 mass enrichment, less than 10% enriched)

² 100 percent enrichment (U-235 mass enrichment, more than 10% enriched)

5.0 INSTRUCTIONS

5.1 Special Nuclear Material Limits

- 5.1.1 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.
- 5.1.2 The presence of the above materials will be determined and documented by the generator, based on process knowledge or testing.
- 5.1.3 Waste accepted shall not contain total quantities of beryllium, hydrogenous material enriched in deuterium, or graphite above one tenth of one percent (0.1%) 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.
- 5.1.4 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.
- 5.1.5 WCS shall require generators to sample and determine the SNM concentration for each waste stream, not to include sealed sources, at a frequency of once per 600 kg if the concentrations are above one tenth the SNM limits of Table 1 on Attachment 1 of this procedure.
- 5.1.6 Prior to shipment of waste, WCS shall require generators to provide a certification containing the following information for each waste stream:
- 5.1.6.1 Waste Description. The description must detail how the waste was generated, list the physical forms in the waste, and identify each uranium chemical composition.

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5.1.6.2 Waste Characterization Summary. The data must include a general description of how the waste was characterized (including the volumetric extent of the waste, and the number, location, type, and results of any analytical testing), the range of SNM concentrations, and the analytical results with error values used to develop the concentration ranges.

5.1.6.3 Uniformity Description. A description of the process by which the waste was generated showing that the spatial distribution of SNM is homogeneous or other information supporting spatial homogeneity.

5.1.6.4 Manifest Concentration. The generator must describe the methods to be used to determine the concentrations on the manifests. These methods could include direct measurement and the use of scaling factors. The generator must describe the uncertainty associated with sampling and testing used to obtain the manifest concentrations.

5.2 WCS shall review the above information and, if adequate, approve in writing this pre-shipment waste characterization and assurance plan before permitting the shipment of a waste stream. This will include statements that WCS has a written copy of all the information required above, that the characterization information is adequate and consistent with the waste description, and that the information is sufficient to demonstrate compliance with Attachment 1, Conditions 1 through 4. Where generator process knowledge is used to demonstrate compliance with Attachment 1, Conditions 1, 2, 3, or 4, WCS shall review this information and determine when testing is required to provide additional information in assuring compliance with the Conditions of Attachment 1. WCS shall retain this information as required by the State of Texas to permit independent review.

5.3 At the time waste is received, WCS shall require generators of SNM waste to provide a written certification with each waste manifest that states that the SNM concentrations reported on the manifest do not exceed the limits in Attachment 1, Condition 1, that the measurement uncertainty does not exceed the uncertainty value in Attachment 1, Condition 1, and that the waste meets Conditions 2 through 4.

5.4 WCS or designee shall sample and determine the SNM concentration for each waste stream, not to include sealed sources, at a frequency of once per 600 kg if the concentrations are above one tenth the SNM limits of Attachment 1, Condition 1. This confirmatory testing is not required for waste to be disposed of at DOE'S WIPP facility.

5.5 WCS shall notify the NRC, Region IV office and the Texas Commission on Environmental Quality within 24 hours if any of the above Conditions are violated. A written notification of the event must be provided within 7 days.

5.6 WCS shall obtain NRC approval prior to changing any activities associated with the above Conditions.

5.7 Waste Generator Sampling Frequency Guidelines

5.7.1 The Waste Generator shall submit a sampling plan for characterizing the SNM waste. The plan shall include (Refer to 5.1.7):

- Sampling methods, alternative methods available
- Sampling points
- Number of samples
- Analysis methods
- Detection levels
- Data reduction and analysis
- Review of the data

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- 5.7.2** Table 3 lists the activity concentrations for each SNM radionuclide.
- 5.7.2.1 Column 1 shows the WCS SNM concentration limit. This value shall not be exceeded.
- 5.7.2.2 Column 2 shows one-tenth of the WCS SNM concentration limit
- 5.7.3** The License Limits for SNM are shown in Table 3 below. The license limits are in units of grams of SNM per grams of waste and are converted to activity. The MDA, Minimum Detectable Activity (represents a 95% confidence level) listed, applies to samples that are low in activity (at or below one-hundredth of the WCS limit). When the sample contains measurable activity, achieving the MDA is not required. Samples should be counted long enough to achieve 15% relative error. Measurement uncertainty applies when there is activity at least 5 times the detection level. The uncertainty for measurements near the detection level will be greater and likely will not be within 15% relative error.
- 5.7.4** If the measured concentration plus the error band is less than one-hundredth of the limit, then a larger error band may be acceptable.

Table 3
Activity Concentration Action Levels

Radionuclide	Operational Limit	Maximum Concentration	0.1 Limit ¹	MDA
	(g SNM/g waste)	(pCi/g)	(pCi/g)	(pCi/g)
U-233	4.7E-04	4.5E+06	4.5E+05	1.0E+02
U-235 (10%) ²	9.9E-04	2.1E+03	2.1E+02	4.0E+00
U-235 (100%) ³	6.2E-04	1.3E+03	1.3E+02	2.5E+00
Pu-239	2.8E-04	1.7E+07	1.7E+06	1.0E+02
Pu-241	2.2E-04	2.3E+10	2.3E+09	4.0E+02

¹WCS is exempt from confirmatory sampling requirements when the values reported by waste generator are at or below this limit.

²10 percent enrichment (U-235 mass enrichment, less than 10% enriched)

³100 percent enrichment (U-235 mass enrichment, more than 10% enriched)

- 5.7.5** The minimum sampling frequency required by the Waste Generator is one sample for every 600 kgs (1300 lbs) of waste if the concentrations are above one tenth the SNM limits (see Table 3 above).

5.8 Sample Analysis Methods

- 5.8.1** The analysis method used to analyze the SNM shall be an industry accepted method, and analysis shall only be performed by a Texas NELAP certified lab.

5.8.1.1 Generally accepted methods of analysis include:

- Gamma Spectroscopy

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- Isotopic Uranium (alpha spectroscopy)
- Isotopic Plutonium (alpha spectroscopy)
- Liquid Scintillation Counting by plutonium separation/alpha spec to determine separation yield/ gas proportional counting.
- Inductively Coupled Plasma (ICP) mass spectroscopy

5.8.2 Direct Analysis Techniques

5.8.2.1 Some direct measurement techniques, such as Non-Destructive Assay (NDA) may also be accepted. The measurement detection levels and uncertainties will need to meet the same criteria as that of direct sampling.

5.9 Waste Generator – Special Nuclear Material Exemption Certification

5.9.1 The Waste Generator shall complete Attachment 1 to this procedure, Special Nuclear Material Exemption Certification, to certify that all requirements for shipment and receipt of SNM to WCS have been met. A completed and signed Attachment 1 shall be attached to the waste profile and the waste manifest.

5.9.2 WCS reviews Special Nuclear Material Exemption Certification and Verification Sampling required in Attachment 1 using the guidelines specified in Attachment 2 for pre-acceptance of SNM at the WCS facility. A completed and signed Attachment 2 shall be attached to the waste profile and the waste manifest.

5.9.3 WCS will review and approve the SNM exemption certification documentation required in Attachment 1 using the guidelines specified in Attachment 2 for final acceptance of SNM at the WCS facility. WCS or designee will perform verification sampling of the waste shipments at a frequency of one sample per 600 kgs (1300 lbs) of waste if the SNM concentrations are above one tenth of the SNM limits.

5.9.4 As verification sampling is performed, any SNM results:

- Shall be sent by overnight mail to the RSO or designee
- The time and date of receipt of the report at WCS shall be noted on the report.
- Upon receipt at WCS, all SNM analytical reports shall be transmitted immediately to the RSO or designee for review.
- If the RSO or designee determines that notification in 5.5 might be required, an investigation will be conducted concurrently with the notifications

5.9.5 Processing of mixed waste containing SNM will be limited to chemical stabilization (i.e., mixing waste with reagents). For batches with more than 600 kilograms of waste, the total mass of SNM shall not exceed the concentration limits in License Condition 17.A.1, times 600 kilograms of waste.

5.9.6 If waste is received that violates any of the Conditions in Attachments 1 & 2, notify the NRC, Region IV office and the Texas Commission on Environmental Quality (TCEQ) within 24 hours; and then provide a written notification within seven days.

5.9.7 WCS shall obtain TCEQ and/or NRC approval, as required, prior to changing any activities associated with the Conditions delineated in this procedure.

5.9.8 To perform SNM Pre-acceptance Sampling or Characterization on incoming SNM wastes that consist of primarily surface contaminated objects and are not amenable to conventional sampling methods, the following alternative method may be used. Other alternate methods may also be used if approved by the RSO or designee.

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- Collect several smears from representative objects within the package. These smears may be combined to form a composite sample, or may be considered as separate samples. Analyze these smears for the SNM nuclides referenced in this procedure.
- Estimate the average surface area for each area that has a specific sample (single smear or group of smears). Also, estimate the total surface area of all the objects in the package.
- After receiving the results for the smears extrapolate the activity to the areas represented by the sample(s), and then further extrapolate it to the total area of the objects in the package. Total the activity for each SNM nuclide, divide it by the total net waste weight in the package, and then compare it to the SNM limits in this procedure.
- Contact the RSO or designee as desired for further guidance.

6.0 RECORDS

6.1 Records demonstrating performance of this procedure shall be created and retained in accordance with all:

- 6.1.1 Applicable statutory and regulatory requirements;
- 6.1.2 Supplemental WCS records management policies and procedures.
- 6.1.3 WCS procedure QA-17, *Quality Assurance Records*; and

6.2 The following completed and authenticated documents are official WCS records:

- 6.2.1 Attachment 1, Special Nuclear Material Exemption Certification Special Nuclear Material Waste Acceptance Criteria (to be completed by the Waste Generator) Records will be retained for the life of the plant.
- 6.2.2 Attachment 2, Guidelines for Pre-acceptance Review of Shipments Containing Special Nuclear Material for the Purpose of Meeting the Exemption under 10 CFR 70 (to be completed by WCS). Records will be retained for the life of the plant.
- 6.2.3 Attachment 3, Guidelines for Final Acceptance Review of Shipments Containing Special Nuclear Material for the Purpose of Meeting the Exemption under 10 CFR 70 (to be completed by WCS). Records will be retained for the life of the plant.

7.0 REFERENCES

- 7.1 Code of Federal Regulations, 10 CFR 70 "Domestic Licensing of Special Nuclear Material"
- 7.2 Code of Federal Regulations, 10 CFR 73.2, "Physical Protection of Plants and Materials"
- 7.3 QA-17, *Quality Assurance Records*
- 7.4 WCS Radioactive Materials License No. R04971
- 7.5 Atomic Energy Act of 1954
- 7.6 NUCLEAR REGULATORY COMMISSION [Docket No. 70-7005; NRC-2009-0283] Issuance of Environmental Assessment and Final Finding of No Significant Impact for Modification of Exemption From Certain NRC Licensing Requirements for Special Nuclear Material for Waste Control Specialists LLC, Andrews County, TX

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Attachment 1
Special Nuclear Material Exemption Certification Attachment
Special Nuclear Material Waste Acceptance Criteria
(To be completed by the Waste Generator)

If SNM (Special Nuclear Material) is present in the waste, this certification form must be completed and signed, certifying the following conditions. This form and all required information must be attached to the waste profile form and the waste manifest.

Condition 1: Please initial at least one, and all applicable SNM isotopes, of the following that applies to the waste stream:

Table 1
Maximum Allowable Concentrations of SNM in Individual Waste Containers

Certifying Initials	SNM Isotope ¹	Operational Limit (g SNM/g waste)	Maximum Concentration (pCi/g)	Measurement Uncertainty (g SNM/g waste) ²
	U-233	4.7E-04	4.5E+06	7.1E-05
	U-235 (10% enriched) ³	9.9E-04	2.1E+03	1.5E-04
	U-235 (100% enriched) ⁴	6.2E-04	1.3E+03	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 When mixtures of these SNM isotopes are present in the waste, the sum-of-the-fractions rule, as illustrated below, shall be used.
- ² The measurement uncertainty values above represent the maximum uncertainty associated with the measurement of the concentration of the particular radionuclide.
- ³ 10 percent enrichment (U-235 mass enrichment, less than 10% enriched)
- ⁴ 100 percent enrichment (U-235 mass enrichment, more than 10% enriched)

Condition 2: Please certify that the following conditions have been satisfied by initialing each box:

- a. Concentrations of SNM in individual waste containers do not exceed the applicable values listed in Table 1, above.
- b. The SNM must be uniformly distributed throughout the waste, so that the limiting concentrations must not be exceeded on average in any contiguous mass of 600 kilograms (1300 lbs) (based on process knowledge or testing).
- c. The mass concentration of carbon, fluorine, and bismuth in the waste must be limited as follows:

Table 2
Maximum Allowable Mass Concentration of Carbon, Fluorine, and Bismuth

Certifying Initials ¹	SNM Isotope	Carbon (C)	Fluorine (F)	Bismuth (Bi)
	U-233	28 wt%	34 wt%	34 wt%
	U-235 (10%) ²	25 wt%	35 wt%	31 wt%
	U-235 (100%) ³	41 wt%	42 wt%	33 wt%
	Pu-239	43 wt%	43 wt%	34 wt%
	Pu-241	37 wt%	39 wt%	32 wt%

- ¹Initial next to isotope only when present/applicable
- ²10 percent enrichment (U-235 mass enrichment)
- ³100 percent enrichment (U-235 mass enrichment, more than 10% enriched)

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Attachment 1

- d. 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.
- e. Waste accepted shall not contain total quantities of beryllium, hydrogenous material enriched in deuterium, or graphite above one tenth of one percent 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.
- f. 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.

Condition 3: Please indicate that the following information is attached to the Radioactive Waste Profile Record by checking each box. (Note: Only this SNM Exemption Certification sheet needs to be included with each manifest, unless an alternative sampling plan was approved at the pre-acceptance stage).

- a. Waste Description. The description must detail how the waste was generated, list the physical forms in the waste, and identify uranium chemical composition.
- b. Waste Characterization Summary. The data must include a general description of how the waste was characterized (including the volumetric extent of the waste, and the number, location, type, and results of any analytical testing), the range of SNM concentrations, and the analytical results with error values used to develop the concentration ranges.
- c. Uniformity Description. A description of the process by which the waste was generated showing that the spatial distribution of SNM is homogeneous or other information supporting spatial homogeneity.
- d. Manifest Concentration. The generator must describe the methods to be used to determine the concentrations on the manifests. These methods could include direct measurement and the use of scaling factors. The generator must describe the uncertainty associated with sampling and testing used to obtain the manifest concentrations.

Condition 4: Generator's certification of compliance with the SNM exemption: I certify that the information provided on this form is complete, true, and correct and is based on process knowledge, physical observations, or laboratory testing. I also certify that any supporting documentation and analytical results have been submitted to WCS. I understand that this information is required to meet the requirements of the U.S. Nuclear Regulatory Commission and the Texas Department of State Health Services and is complete and accurate in all material respects.

Waste Generator Name _____ WCS Waste Profile #: _____

Authorized Signature Printed Name Title Date

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Attachment 2 **Page 1 of 2**
Guidelines for Pre-acceptance Review of Shipments Containing Special Nuclear Material for the Purpose of Meeting the Exemption under 10 CFR 70.
(To be completed by WCS)

Pre-acceptance review of the waste profile information shall be performed in accordance with OP-1.1.1 and supplemented by this procedure when SNM is present in the waste.

A Special Nuclear Material Exemption Certification (Attachment 1 of this procedure) must be attached to the waste profile if any of the radionuclides in condition 1 (of the SNM Exemption Certification) appear on the waste profile.

The Special Nuclear Material Exemption Certification Attachment shall be reviewed and verified as follows:

Condition 1: Verify that at least one box has been checked in Condition 1 and this matches the information on the waste profile.

Condition 2: Verify that all boxes in Condition 2 have been checked.

- 2.a. The value for the checked radionuclide is less than the maximum indicated limit in Condition 1 and that no other radionuclides listed in Condition 1 appear on the waste profile. If other radionuclides are checked insure that the sum-of-the-fractions is less than one.
- 2.b. Verify by review of the waste profile that the SNM is uniformly distributed.
- 2.c. Verify by review of the waste profile that the specified mass concentration limits have been met.
- 2.d. Verify by review of the waste profile that all weight fraction limitations have been applied.
- 2.e. Verify by review of the waste profile that the total quantities of beryllium, hydrogenous material enriched in deuterium, or graphite are less than one-tenth the total weight of the waste..
- 2.f. Verify by review of the waste profile that the waste does not contain soluble forms of plutonium and uranium greater than the amounts of SNM of low strategic significance as defined in 10 CFR 73.2..

Condition 3: Verify that all boxes in Condition 3 have been checked and the required additional information is attached.

- 3.a. Review the information to verify that it supports the certifications provided.
- 3.b. Verify that the Waste Generator's waste sampling and characterization methodology meets the following guidelines.
 - 3.b.1 If the average concentration of the SNM radionuclide with the highest concentration is between the limit in Condition 1 and one-tenth of the limit: At least four uniformly distributed aliquots per composite sample for every 600 kg (1300 lbs) of waste is required.
 - 3.b.2 Direct sampling is the preferred method of waste characterization. Scaling factors and/or process knowledge may be used as an alternative or supportive method of characterization, however the information provided in 3.d. must be of sufficient detail and quality to justify its use.

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Attachment 2

3.b.3. If direct sampling is performed and the sample frequency is not otherwise limited by the above weights, the following is the minimum sampling frequency for acceptance at WCS. However, process knowledge can also be used in conjunction with direct sampling or direct measurement techniques as an equivalent way of satisfying the minimum sampling requirements."

- 20-yd³ Rolloffs: A composite sample consisting of at least four uniformly distributed aliquots per composite sample from the box.
- Boxes, Drums, and Smaller Containers: A composite sample consisting of one aliquot from each container to achieve the above total weight per sample.
- Debris. Sampling should be performed by taking representative cuttings, borings, or small pieces. If this is not possible, the concentration may be determined by performing surface surveys and converting the survey data to total mass of each SNM radionuclide, and then dividing by the mass of the material.

3.c. Verify that the information submitted is supported by measurements and/or other data that provides reasonable assurance that the conclusion of uniform distribution is valid. Additional documentation and sampling may be required if this condition cannot be verified by process knowledge and/or initial sampling.

3.d. Verify that the uncertainty in the methods used to obtain the SNM concentrations on the waste profile is within the limits of Attachment 1, Table 1. If other than direct measurements are used, additional statistical or other data should be provided to show that these correlations meet the uncertainty requirements under Attachment 1, Table 1.

Condition 4: Verify that the SNM Exemption Certification is appropriately dated and signed.

If proper justification has been given to WCS, a different sampling plan (site characterization data) may be submitted for approval at the pre-acceptance (waste profile) stage. If pre-acceptance approval is given on this basis then the entire package of information (Condition 1, 2, and 3) must again be submitted at the final acceptance (waste manifest) stage.

I certify that written documentation for all the above information has been reviewed and verified and is on file.

WCS Waste Profile #: _____ Is Attachment 3 Required? Yes _____ No _____

Waste Acceptance Review _____
Signature Title Date

Health Physicist Review _____
Health Physicist Date

Pre-Acceptance Approval _____
Radiation Safety Officer or Designee Date

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Guidelines for Final Acceptance Review of Shipments Containing Special Nuclear Material for the Purpose of Meeting the Exemption Under 10 CFR 70.
(To be completed by WCS)

The receipt and inspection of all incoming low level waste shipments shall be performed in accordance with OP-1.2.2.

Final acceptance review of the waste manifest information shall be performed in accordance with OP-1.1.2 and as supplemented by this procedure if SNM is present in the waste.

A Special Nuclear Material Exemption Certification form (Attachment 1 from this procedure) must be attached to each waste manifest. Upon receipt of the waste, perform the same review and verification of the Special Nuclear Material Exemption Certification form against each waste manifest using the guidelines for only Condition 1 and 2 of the above pre-acceptance review, unless an alternative sampling plan was approved at the pre-acceptance stage, then a full review is required.

WCS Verification Sampling

After arrival at the site, WCS or designee shall sample and determine the SNM concentration for each waste stream, not to include sealed sources, at a frequency of once per 600 kg if the concentrations are above one tenth the SNM limits of Condition 1. This confirmatory testing is not required for waste to be disposed of at DOE'S WIPP facility.

Acceptance sampling of the waste by WCS shall be performed in general accordance with OP-1.2.24.

Sample handling, chain of custody, and quality assurance shall be performed in accordance with RS-1.9.1.

The minimum detectable activity (MDA) at the 95% confidence level (2 sigma relative error uncertainty) for the various SNM radionuclides shall be as follows:

Maximum Allowable MDA

Radionuclide	MDA (pCi/gm)
U-235 (10%) ¹	4.0
U-235 (100%) ²	2.5
U-233	100
Pu-239	100
Pu-241	400

¹ 10 percent enrichment (U-235 mass enrichment, less than 10% enriched)

² 100 percent enrichment (U-235 mass enrichment, more than 10% enriched)

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Analysis will be performed by a Texas NELAP certified laboratory using industry-accepted methods. Specify that the analysis report SHALL be sent using overnight service to the attention of the Radiation Safety Officer of delegate, for review. All analytical records for SNM will have the time and date received noted on the document.

If the result of the verification sampling for the SNM radionuclides is greater/less than three times the manifest values, the customer will be contacted to resolve the discrepancy in results. For low activity waste (near the MDL), the verification sampling results may be up to a factor of ten different than the manifest values.

Note: If any of the Conditions have been violated, WCS shall notify the Nuclear Regulatory Commission, Region IV office and the Texas Commission on Environmental Quality within 24 hours; and then provide a written notification within seven days. Any investigations concerning the validity of analytical results shall be made in concurrence with the required notifications.

WCS shall obtain NRC approval prior to changing any activities associated with the above Conditions.

I certify that written documentation for the above information has been reviewed and is on file.

WCS Waste Profile #: _____

Bill of Lading or Manifest #: _____ NRC 540/541 Manifest#: _____

Waste Acceptance Review _____
Signature Title Date

Health Physicist Review _____
Health Physicist Date

Final Acceptance Approval _____
Radiation Safety Officer or Designee Date