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ALD-TIM-95-0829

May 26, 1995

Mr. Norman Nixon,
Patent Office
Westinghouse Savannah River Company
Savannah River Site
Aiken, SC 29808

Dear Mr. Nixon:

REQUEST FOR APPROVAL TO RELEASE SCIENTIFIC/TECHNICAL INFORMATION (U)

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Jeannie Sellers, Manager
WSRC STI Program

Document No. WSRC-IM-91-53, Vol X
Document Title 1993 RCRA Part B Permit Renewal Application - Savannah River Site, Volume X - Consolidated Incineration Facility, Section C, Rev.1, August 1993
Author G. Molen

WSRC response due by July 7, 1995 Reading Room
Patent Related? ☑ No ☐ Yes
WSRC Remarks

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WSRC

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Westinghouse Savannah River Company
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D. F. Nolen — Author's Signature — 2-5672 — 5-18-95 Date

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Explanations

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1. (Award) Contract No. DE-AC09-89SR18035

2. Title 1993 RCRA Part B Permit Renewal Application - Savannah River Site, Volume X - Consolidated Incineration Facility, Section C, Rev.1, August 1993

3. Product/Report Description

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C. Contact *(Person knowledgeable of content)*

Name G. Molen
Phone 2-5672, Beeper-5990
Position _____
Organization Environmental Protection

PART 2 *(DOE/DOE Contractors complete/or as instructed by DOE contracting officer)*

A. DOE Identifiers

1. Product/Report Nos. WSRC-IM-91-53, Vol X

2. Funding Office(s) *(NOTE: Essential data)* DOE-SR

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D. Releasing Official

A. Patent Clearance *("x" one)*
☑ Has been submitted for DOE patent clearance
☐ DOE patent clearance has been granted

B. Released by
(Name) Jeanne Sellers
(Signature) Sharon Lyerly
(Phone) (803) 725-2321
(Date) _____

Westinghouse
Savannah River Company

P.O. Box 616
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May 26, 1995

WSRC-IM-91-53, Vol X
ALD-TIM-95-0829

Ms. W. F. Perrin, Technical Information Officer
U. S. Department of Energy
Savannah River Operations Office
Aiken, SC 29801

Dear Ms. Perrin:

REQUEST FOR APPROVAL TO RELEASE SCIENTIFIC/TECHNICAL INFORMATION

The attached document is submitted for classification and technical approvals for the purpose of external release. Please complete Part II of this letter and return the letter to the undersigned by 07/07/95. Patent clearance, if necessary, is requested and received via direct communications between this office and the DOE-SR Patent Counsel. The document has been reviewed for classification by a WSRC classification staff member and has been determined to be Unclassified.

Jeanne Sellers, WSRC STI Program Manager

I. DETAILS OF REQUEST FOR RELEASE

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Department: Environmental Protection

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II. DOE-SR ACTION Date Received by TIO 5/26/95

- [X] Approved for Release
- [ ] Approved Upon Completion of Changes
- [ ] Approved with Remarks
- [ ] Not Approved
- [ ] Revise and Resubmit to DOE-SR

Remarks

W. F. Perrin, Technical Information Officer
DOE-SR

6/16/95
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1993 RCRA Part B Permit Renewal Application - Savannah River Site, Volume X - Consolidated Incineration Facility, Section C, Rev.1, August 1993

by
G. Molen
Westinghouse Savannah River Company
Savannah River Site
Aiken, South Carolina 29808

DOE Contract No. DE-AC09-89SR18035

DISCLAIMER

C. WASTE CHARACTERISTICS

This section describes the chemical and physical nature of the Resource Conservation and Recovery Act (RCRA) regulated hazardous wastes to be handled, stored, and incinerated at the Consolidated Incineration Facility (CIF) located at the Savannah River Site (SRS), and is in accordance with the requirements of South Carolina Hazardous Waste Management Regulations (SCHWMR) R.61-79.264.13(a) and (b), and 270.14(b)(2). These hazardous wastes may be solid, liquid, semisolid, sludge, or refuse (trash), and all are solid wastes as defined in SCHWMR R.60-79.261 Subpart A, Section 261.2. However, the term solid or solid waste is used generically in this application and refers to wastes that are nonpumpable, i.e., solids (powders, chunks, etc.), semisolids, sludges, or refuse (trash, job control waste, etc.), while the term liquid or liquid waste refers to all pumpable wastes. All container storage areas are designed to store containers with free liquids (Section D); therefore, it is not necessary to determine if a sludge contains free liquids in order to designate the proper storage area.

This application is for a permit to store and treat these hazardous wastes as required for the operation of the CIF. The permit is to cover the storage of hazardous waste in containers (including containers of liquid hazardous wastes to be incinerated, rejected containers of hazardous waste to be returned to the generator, containers of solidified or unsolidified ash, and containers of solid wastes to be incinerated). The permit is also to cover the storage of waste in six hazardous waste storage tanks (four for incinerator feed waste and two for offgas blowdown). The treatment processes to be permitted include incineration, solidification of the ash, and neutralization of the scrubber blowdown. Liquid hazardous wastes will also be blended in the storage tanks.

C.1 Chemical and Physical Analyses

[REF: R.61-79.264.13(a); 270.14(b)(2)]

Hazardous wastes will be received at the CIF from hazardous waste storage facilities (HWSFs) or generators at the SRS. Information on these HWSFs is contained in other volumes as detailed in Volume I of the Application for a Part B Hazardous Waste Permit for the SRS of the United States (U.S.) Department of Energy (DOE). All solid hazardous waste will be prepackaged in combustible containers by the waste generators or by Waste Management Operations (WMO) Department personnel prior to shipping it from other SRS locations to the CIF. All liquid hazardous wastes will be shipped in containers or tank trucks and unloaded into CIF storage tanks. No lab packs will be incinerated at the CIF.

SRS has designed the CIF system to treat South Carolina Department of Health and Environmental Control (SCDHEC)-regulated hazardous waste, mixed waste, and low-level radioactive waste. As part of the incineration system, six tanks provide storage for liquid waste: four tanks for incinerator feed wastes and two tanks for scrubber blowdown waste. Details of the incinerator system and the RCRA trial burn plan for the incinerator are discussed in Section D.5.

Table C-1 lists the SCDHEC/U.S. Environmental Protection Agency (EPA) hazardous waste numbers of the wastes that are to be included in the permit for storage and incineration at the CIF. Table C-2 is a listing of the categories of hazardous waste that will be fed to the incinerator. The SRS Hazardous Waste Index (HWI) numbers listed are examples of current hazardous wastes that fit in these categories and are not to limit this permit to these specific wastes. Any waste listed in Table C-1 may be placed in any of the categories depending on its physical form or heat value. Many of the wastes in these categories were analyzed by SRS during a screening for incineration candidates. These analyses allowed the wastes to be categorized into groups of similar wastes as listed in Table C-2. Because many varying but similar wastes are grouped together, several EPA waste numbers

Table C-1. List of SCDHEC/EPA Waste Numbers of Wastes to be Stored and/or Incinerated

Characteristic Wastes				
D001	D002	D003	D004	D005
D006	D007	D008	D009	D010
D011	D012	D013	D014	D015
D016	D017	D018	D019	D020
D021	D022	D023	D024	D025
D026	D027	D028	D029	D030
D031	D032	D033	D034	D035
D036	D037	D038	D039	D040
D041	D042	D043		
Spent Solvents and Wastewater Treatment Sludge				
F001	F002	F003	F004	F005
F006				
Other Designated Wastes				
5555	6666	7777		
Toxic Wastes				
U001	U002	U003	U004	U006
U007	U008	U009	U011	U012
U014	U017	U019	U021	U022
U023	U025	U027	U028	U031
U032	U034	U036	U037	U041
U043	U044	U045	U046	U047
U048	U050	U051	U052	U053
U055	U056	U057	U060	U061
U063	U067	U069	U070	U071
U072	U073	U074	U075	U076
U077	U078	U079	U080	U081
U082	U083	U084	U088	U091
U092	U095	U102	U103	U105
U106	U108	U109	U110	U112
U115	U116	U117	U121	U122
U123	U124	U125	U127	U128
U129	U130	U131	U132	U133
U134	U136	U138	U140	U142
U144	U146	U147	U151	U154
U157	U158	U159	U161	U162
U165	U166	U167	U169	U170
U171	U182	U183	U184	U185
U187	U188	U190	U196	U197
U201	U204	U207	U208	U209
U210	U211	U213	U215	U216
U218	U219	U220	U223	U225
U226	U227	U228	U234	U236
U239	U247	U328	U359	
Acutely Toxic Hazardous Wastes				
P005	P009	P011	P012	P016
P017	P018	P022	P023	P024
P028	P037	P045	P048	P051
P054	P059	P060	P063	P064
P065	P069	P070	P077	P089
P093	P095	P098	P102	P104
P105	P106	P108	P112	P113
P116	P119	P120	P123	

Table C-2. Hazardous Waste Categories

Waste Category	SCDHEC/EPA Waste Number	Example SRS HWI[a] Number
Solid Waste[b]	Any one or combination of the Waste Codes in Table C-1	028 046 047 079 080 081
High heat value liquid waste[c]	Any one or combination of the Waste Codes in Table C-1	006 007 013 015 019 026 027 029 034 048 056 063
Low heat value liquid waste[d]	Any one or combination of the Waste Codes in Table C-1	014 016 017 018 020 021 022 030 035 043 045

NOTES:
[a] Savannah River Site hazardous waste index (SRS HWI).
[b] Solids can include containerized solid wastes, contaminated soils, spill cleanup, discarded chemical products, contaminated trash, laboratory waste, containerized sludges, and other contaminated materials. These solids may be contaminated with wastes that have any of the waste numbers listed.
[c] High heat value liquids are liquids with heat of combustion greater than or equal to 7500 Btu per lb.
[d] Low heat value liquids are liquids with heats of combustion less than 7500 Btu per lb.

and HWI numbers apply to the wastes in a single category. Some wastes will contain low-level radioactive contaminants.

Table C-3 shows the hazard classification and its basis for the hazardous waste categories that will be incinerated at the CIF. Existing wastes have been sampled and analyzed during the screening for incinerator candidates and classified in these categories. Appendix 8 contains summary data sheets for each of the wastestreams that the CIF will receive. **However, the CIF is not limited to receive only those waste streams with HWI numbers listed in Appendix 8.** Also included are laboratory reports on specific wastes in some of the wastestreams. These data sheets are examples of the current wastes and are not intended to characterize every waste that the CIF may receive. **Any waste stream whose waste numbers are listed in Table C-1 may be processed at the CIF.**

Some of the wastes, such as spill cleanup, contaminated trash, and contaminated materials, may be handled as generic type hazardous wastes. Generic hazardous wastes are wastes that typically have one or more of the following characteristics:

- Difficult or impossible to sample representatively
- Similar wastes generated at more than one facility
- Wastes which potentially contain different F listed solvents and/or U or P listed commercial chemical products.

These generic hazardous wastes can be safely handled with minimal routine sampling and analysis. All wastes currently inventoried for the incinerator have been analyzed to determine their category. As generic wastes are generated, it will be assumed that they possess the same hazardous characteristics as the wastes in that category which are currently inventoried and will be handled accordingly. If the origin of a spill or waste cannot be clearly identified, it will be considered an unknown material. Sampling and analysis will be performed for unknown wastes, new wastes, and as changes in processes warrant. A system of administrative control will initiate sampling and analysis when these conditions exist. The department generating the waste will notify the CIF of process changes or new wastes and will arrange for sampling and analysis per the Waste Analysis Plan.

Table C-3. Summary of Waste Information

Waste Category	Hazard Classification	Basis
Solid Waste	Toxic, ignitable, reactive, corrosive	Contains listed or characteristic waste
High heat value liquid waste	Toxic, ignitable, reactive, corrosive	Contains listed or characteristic waste
Low heat value liquid waste	Toxic, ignitable, reactive, corrosive,	Contains listed or characteristic waste

C.1.1 CONTAINERS

[REF: R.61-79.264.172; 264.177; 270.15(b)(1), (d)]

A wide variety of containers may be used at the CIF. Liquids may be received in drums, portable tanks of various sizes, or other containers. All containers will be selected to be compatible with the waste placed in them and of a size that allows safe and efficient handling of the material. See Table C-3 for the specific hazard classifications that may be assigned to liquid wastes.

Solids will be received in combustible containers, such as boxes. The combustible containers may have a plastic inner liner or coating such as polyethylene or polyvinyl chloride when necessary to provide containment or compatibility. Combustible boxes will be constructed of cardboard. The container and/or liner will be selected to be compatible with the solid waste placed in the container. All combustible containers will be purchased from commercial vendors and delivered directly to SRS waste generators. The generators will ship filled waste containers to the CIF via truck. All containers of solids will be monitored by an X-ray machine as they are unloaded from the truck, and any containers with bottles of free liquid or large metal objects will be rejected and returned to the sender. See Table C-3 for the specific hazard classifications that may be assigned to solid wastes.

All containerized wastes will be labeled by the generator; the labels will describe the contents of each container and other required information. A sample label is shown in Fig. D-2, in Section D. The containers will also be labeled with a bar code identifying an analysis of the contained waste. These analytical data will be kept in the operations log at the facility. The same labels will also be used for ash drums.

C.1.2 TANKS

[REF: R.61-79.264.192]

The specific gravity of the liquids stored in the hazardous waste tanks at the CIF will be no greater than 1.15. The parameters of the liquid wastes to be stored in the tanks at the CIF are presented in Table C-4.

C.1.3 WASTE PILES

[REF: R.61-79.264.250(c)(1)(4)]

There will not be any waste piles at the CIF; therefore, this section does not apply.

C.1.4 SURFACE IMPOUNDMENTS

[REF: R.61-79.264.221(a)]

There will not be any surface impoundments at the CIF; therefore, this section does not apply.

C.1.5 INCINERATORS

C.1.5.1 Trial Burn

[REF: R.61-79.270.62(b)(2)(i)]

The analysis of the test mixture to be burned during the trial burn is given in the Trial Burn Plan (Section D.5). Analysis of the wastes to be burned after the trial burn is given in Appendix 8. The 40 Code of Federal Regulations (CFR) 261, Appendix VIII constituents that will be

Table C-4. Waste Analysis Parameters and Rationale for Incinerator Feed Waste

Hazardous Waste	Parameter	Rationale
Solid Waste	Incineration Parameters[a]	See note b
High heat value liquid waste	Incineration Parameters[a]	See note c
Low heat value liquid waste	Incineration Parameters[a]	See note c
New, unknown, and process change liquid waste	Ignitability, corrosivity, reactivity, TCLP, heat value, organic chlorine, viscosity, and ash content.	See note d
New, unknown, and process change solid waste	Reactivity, TCLP heat value, organic chlorine, and ash content	See note d

NOTES: [a] Heat value, organic chlorine, ash content, and viscosity of liquids.
[b] Process knowledge will be used to determine which solids are analyzed for organic chlorine.
[c] This waste will be fed directly to the incinerator or blended with other waste in a storage tank and fed to the incinerator as a part of the total blend. The analytical parameters have been selected to allow proper handling and/or blending and to fulfill anticipated permit requirements.
[d] The selection of the appropriate parameters to be analyzed for new, unknown, and process change wastes will be based on process knowledge.
TCLP Toxicity Characteristic Leaching Procedure

incinerated (and tested for) are listed in Appendix 9 of this volume of the permit application.

C.1.5.2 Data in Lieu of Trial Burn

[REF: R.61-79.270.19(c)(1)]

A trial burn will be performed; therefore, this section does not apply.

C.1.6 LANDFILLS

[REF: R.61-79.264.314]

There will not be any landfills at the CIF; therefore, this section does not apply.

C.1.7 LAND TREATMENT

[REF: R.61-79.264.272(a)]

There will not be any land treatment units at the CIF; therefore, this section does not apply.

C.2 Waste Analysis Plan

[REF: R.61.79.270.14(b)(3); 264.13(b) and (c); 268.7]

C.2.1 PARAMETERS AND RATIONALE

[REF: R.61-79.264.13(b)(1)]

This waste analysis plan is designed to characterize the wastes and waste blend mixtures that will be fed to the incinerator, and to demonstrate compliance with the Land Disposal Restriction (LDR) standards.

Table C-5 shows the various parameters for analysis and rationales for selection that will be used to characterize incinerator candidate wastes. Analytical parameters for each wastestream will include analysis for the parameters associated with the EPA Hazardous Waste Numbers assigned to that stream in the Part A. If sufficient process knowledge exists on a particular waste, it will be analyzed for only the parameters reasonably expected to be present in the waste. For example, a drum of U002 off-spec acetone which is part of wastestream HWI #86 will not be analyzed for the entire list of U and P codes associated with HWI #86. Additional parameters will be selected based on process knowledge, historical analytical database information, and other information supplied by the generators.

C-4

Table C-5 shows the hazardous waste categories that will be fed to the incinerator, the analytical parameters that apply to each, and the rationale for the selection of parameters. The wastes within these categories may be blended with other compatible wastes in one of the blend tanks, if necessary, to meet heating value requirements or other incineration parameters. [All blended waste will be analyzed for the parameters in Table C-5 before the blend is fed to the incinerator.]

Table C-5. Rationale for Selection of Waste Analysis Parameters for Incinerator Candidate Waste

Parameter	Rationale
pH, alkalinity or acidity	Analyses needed for aqueous solutions to determine proper handling and storage; may also be characteristic of a particular process waste; therefore, used as a fingerprint parameter.
Specific anions/cations	These parameters may be run-on aqueous samples to account for major constituent or type of acid/base/salt present; wastes containing cyanide and sulfide must be measured at the ppm level because there are possible toxic effects to be considered during handling and storage or incineration.
Solids (total suspended solids and particle size in liquids)	Type and concentration of solids are important for aqueous and organic liquid samples to determine incineration and pumping/handling characteristics; significant changes in solid concentrations may reflect a change in the waste chemical composition.
Selected organics	Based on data supplied by the generator, major organic compound components, hazardous constituents, or priority pollutants may be selected for analysis to verify waste characteristics.
Flash point	Knowledge of this parameter helps to ensure safe handling and storage of a waste; changes, especially towards lower temperature values, must be known to avoid a potential fire/explosion hazard.

Table C-5. Rationale for Selection of Waste Analysis Parameters for Incinerator Candidate Waste

Parameter	Rationale
Elemental analysis (carbon, hydrogen, sulfur, nitrogen, phosphorus, and organically bound[a] halide)	Knowledge of these parameters is necessary for determination of the incineration system conditions, (i.e., computation of stoichiometric air requirements); when information on the chemical nature of waste is well defined, these parameters may not be required; changes in key parameters such as phosphorus, sulfur, and organic halide must be known so the adequacy of pollution control equipment can be confirmed.
Heavy metals	Levels of heavy metals, particularly Appendix VIII metals, in a waste need to be known to ensure that losses to the environment are properly managed.
Specific gravity	Specific gravity value is important in calculations to provide a material balance across a treatment process and to give a true value of the amount of wastes being handled; changes in the specific gravity definitely signal a change in the makeup of the waste.
Ash content	Ash content is important for evaluating wastes for incineration to determine potential slag formation, assess particulate loading, and determine if the ash handling system is sufficient; changes in ash content may reflect significant changes in the inorganic constituents of the waste.

Table C-5. Rationale for Selection of Waste Analysis Parameters for Incinerator Candidate Waste

Parameter	Rationale
Heat of combustion (Btu/lb)	This parameter is needed for incineration candidates to determine heat load for proper incineration operation and to allow for auxiliary fuel usage as required; changes in Btu level of a waste reflect changes in the organic composition of the waste.
Percent water	Water concentration will determine whether the waste should be treated as an aqueous waste; water concentration can be used to determine storage (especially compatibility) and handling requirements, and provide material balance on solid wastes; changes in water content must be known to ensure adequate treatment.
Viscosity	Viscosity values will help determine the method of waste handling, blending, and storage; very viscous wastes may require heating or special pumps for transfers; changes in viscosity may affect the handling and storage requirements; important in calculating feed rates.

NOTE: [a] Only organically bound halides disassociate significantly during incineration. The Guidance Manual for Hazardous Waste Incinerator Permits states that measurement of organically bound chloride is to evaluate potential emissions of hydrogen chloride. In addition, salts of halides have not been detected in the wastes analyzed as candidates for incineration.

C.2.2 TEST METHODS

[REF: R.61-79.264.13(b)(2)]

The test methods that will be used to measure the analytical parameters for the incoming wastes and incinerator feed wastes are shown in Table C-6. Where more than one method is listed, it will be up to the discretion of the Analytical Laboratory to decide which of the methods to use. Some of the sources of these methods are: "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," 1986, Office of Water and Waste Management, Washington, D.C., SW-846, 3rd edition; "Methods for the Chemical Analysis of Water and Wastes," (EPA-600/4-79-020); "Sampling and Analysis Methods for Hazardous Waste Combustion," (EPA-600/8-84-002); and "Standard Methods for the Examination of Water and Wastewater" (16th edition).

Testing of the ash will be done routinely to ensure proper handling and processing of the waste.] The treatment process of the waste is not complete until the ash has been solidified in the Ashcrete Unit. Therefore, testing to demonstrate compliance with the LDR will be done on the solidified ash.

The liquid blowdown stream will be tested to demonstrate compliance with LDR for the organic constituents prior to solidification in Y-Area. For inorganic constituents in which solidification is the primary treatment, Y-Area will demonstrate compliance with LDR after the solidification is complete.

Test methods used to test for parameters in the incinerator ash, ashcrete, blowdown, and secondary sump accumulations are provided in Table C-7.

Table C-6. Waste Analysis Parameters and Test Methods For Incoming Incinerator Wastes

Parameter	SW-846[a]	EPA Water and Wastes[b]	Standard Methods[c]	ASTM Method No.[d]	EPA-600/ 8-84-002[e]
Heat Value				D 2382-76	A006
Organic Chlorine				D 2361	A004
Ash Content				D 481-80	A001
pH	9041	150.1			
Ignitability	1010			D 93-80	
Reactivity	Section 7.3				
Elemental C, H, P, & halides					A005
Water				D 1744-64	
Specific Gravity			213E		
Total Solids		160.3	209A		
Total Dissolved Solids		160.1	209B		
Total Suspended Solids		160.2	209C		
Halogens, Cl				D 808-81	
Viscosity				D 445-82	A005
Total Organic Carbon (TOC)	9060			D 446-74	
Halogenated Volatile Organics	8010				
Nonhalogenated Volatile Organics	8015				
Aromatic Volatile Organics	8020				

Table C-6. Waste Analysis Parameters and Test Methods For Incoming Incinerator Wastes

Parameter	SW-846[a]	EPA Water and Wastes[b]	Standard Methods[c]	ASTM Method No.[d]	EPA-600/ 8-84-002[e]
Acrylonitrile/ Acetonitrile	8030				
Phenols	8040				
Phthalate Esters	8060				
Organochlorine Pesticides	8080				
Nitroaromatics	8090				
Polynuclear Aromatics	8100				
Chlorinated Hydrocarbons	8120				
Organophosphorous Pesticides	8140				
Chlorinated Herbicides	8150				
TCLP[f]	1311				
Metals (other than TCLP)	7040-7951	202-289			
Radioactivity	Liquid Scintillation based on DOE Orders				

NOTES:
[a] "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," 1986, Office of Water and Waste Management, Washington, D.C., SW-846, 3rd Edition
[b] "Methods for the Chemical Analysis of Water and Wastes, EPA-600/4-79-020
[c] "Standard Methods for the Examination of Water and Wastewater," (16th Edition)
[d] American Society for Testing and Materials (ASTM), 1991
[e] "Sampling and Analysis Methods for Hazardous Waste Combustion," EPA-600/8-84-002
[f] TCLP – Toxicity Characteristic Leaching Procedure

Table C-7. Analysis Parameters and Test Methods for Secondary Waste Products

Parameter	SW-846[a]	EPA Water and Wastes[b]	Standard Methods[c]	ASTM Method No.[d]	Waste to be Tested
pH	9041	150.1			A, BD, S
Water				D 1744-64	A, BD
Specific Gravity			213E		A, BD, AC
Total Solids		160.3	209A		A, BD
Total Dissolved Solids		160.1	209B		A, BD
Total Suspended Solids		160.2	209C		A, BD
Halogens, Cl				D 808-81	A, BD
Viscosity				D 445-82, D 446-74	BD
Paint Filter Test	9095				AC
Halogenated Volatile Organics	8010				AC, BD
Nonhalogenated Volatile Organics	8015				AC, BD
Aromatic Volatile Organics	8020				AC, BD
Acrylonitrile/ Acetonitrile	8030				AC, BD
Phenols	8040				AC, BD
Phthalate Esters	8060				AC, BD
Organochlorine Pesticides	8080				AC, BD
Nitroaromatics	8090				AC, D
Polynuclear Aromatics	8100				AC, BD
Chlorinated Hydrocarbons	8120				AC, BD
Organophosphorus Pesticides	8140				AC, BD
Chlorinated Herbicides	8150				AC, BD
TCLP[e]	1311				AC, BD
Metals (other than TCLP)	7040-7951	202-289			AC, BD
Total Organic Carbon (TOC)	9060			D 446-74	AC, BD
Oil and Grease	9070				S

NOTES: A = Ash; AC = Ashcrete; BD = Blowdown; S = Sumps

[a] "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," 1986, Office of Water and Waste Management, Washington, D. C., SW-846, 3rd Edition

[b] "Methods for the Chemical Analysis of Water and Wastes," EPA-600/4-79-020

[c] "Standard Methods for the Examination of Water and Wastewater," (16th Edition)

[d] American Society for Testing and Materials, 1991

[e] TCLP – Toxicity Characteristic Leaching Procedure

C.2.3 SAMPLING METHODS

[REF: R.61-79.264.13(b)(3); 261 Appendix I]

The sample collection and handling methods are summarized in Table C-8 and are in accordance with EPA-approved sampling protocols contained in SW-846. Coliwasa (composite liquid waste samplers) type samplers are used for sampling liquid waste in containers. This type of sampler permits a representative sampling of multiphase waste of a wide range of viscosity, corrosivity, volatility, and solid content. The ashcrete will be sampled before the cement/ash mixture has solidified. The sample will be allowed to solidify prior to testing.

C.2.4 FREQUENCY OF ANALYSIS

[REF: R.61-79.264.13(b)(4)]

The CIF waste analysis plan is designed to characterize wastes that are fed to the incinerator and to demonstrate compliance with LDR. Existing wastes have been sampled and analyzed during screening for incineration candidates. Each hazardous wastestream routinely generated at SRS, except for job control wastes, will be analyzed at least annually and when a significant process change occurs. If analysis is done due to a process change, it will be done only on parameters that are likely to change based on initial analysis and on knowledge of the process producing the waste.

Solid waste such as spill cleanup, job control waste, contaminated soils, and contaminated trash will not be analyzed when the source of the contamination is known. SRS believes that these solid hazardous wastes can be handled safely without routine sampling and analysis. Unknown wastes will be analyzed. Wastes currently inventoried for the incinerator have been analyzed to determine their category. Routine solid waste

Table C-8. Sample Collection and Analysis Methods

Hazardous Waste[a]	Containers	Number of Samples	Description	Reference
Solid waste	All[a]	3 containers	Auger sampler[b]	SW-846
High heat value liquid waste	Truck[c]	3 per truck	Coliwasa	SW-846
	Containers[d]	3 containers	Coliwasa	SW-846
	Tank	3 per tank	Grab tank recycle[e]	SW-846
Low heat value liquid waste	Truck[c]	3 per truck	Coliwasa	SW-846
	Containers[d]	3 containers	Coliwasa	SW-846
	Tank	3 per tank	Grab tank recycle[e]	SW-846
New, unknown, and process change liquid waste, sumps	Truck[c]	3 per truck	Coliwasa	SW-846
	Containers[d]	3 containers	Coliwasa	SW-846
	Sumps	3 per sump	Dipper	SW-846
New, unknown, and process change solid waste	All[a]	3 containers	Auger sampler[b]	SW-846
Ash	Ash drums[f]	3 containers	Coliwasa	SW-846
Ashcrete	Ashcrete drums[g]	3 containers	Dipper	SW-846
Blowdown	Tank	3 per tank	Grab tank recycle[e]	SW-846

NOTES:
[a] Solids will be handled in combustible containers including boxes, fiberpacks, pails, et al.
[b] These wastes are difficult or impossible to sample representatively. The sampling equipment described in SW-846, Chapter 9, will be used where applicable. Job control waste cannot be representatively sampled.
[c] This includes tank trucks and vacuum tanks.
[d] This includes drums, portable tanks, etc.
[e] The tank will be agitated, and the sample will be taken off at a sample port on a circulating loop.
[f] Ash will be sampled from the drums prior to entry into the Ashcrete Unit.
[g] Ashcrete will be sampled from the drums soon after exit from the Ashcrete Unit prior to hardening.

streams will be analyzed at least annually or when a significant process change or feed change occurs. Nonroutine solid wastestreams will be analyzed per batch.

In addition to the annual analysis discussed above, each batch of liquid waste or waste blend accumulated in one of the CIF waste storage tanks will be analyzed before the waste is pumped to the incinerator (Table C-5 for parameters to be analyzed). The wastestream being directly fed from the Defense Waste Processing Facility (DWPF) will be analyzed after major process changes and at least quarterly for parameters in Table C-5. If new waste must be placed in the tank from which the incinerator is being fed, the waste transfer from that tank to the incinerator will be terminated. The newly created blend will be reanalyzed against Table C-5 parameters and determined to be within permitted limits before feed to the incinerator is restarted.

Secondary waste from the incinerator (ashcrete and blowdown) will be analyzed to demonstrate LDR compliance at least once every quarter and when significant process change occurs. The following events would be considered to be significant process changes and would result in the analysis of the secondary waste.

- Incineration of a wastestream (HWI #) that had not been previously processed
- Incineration of waste from a generator that had not previously sent waste to the CIF
- Incineration of previously processed waste in which the waste composition has changed significantly.

Sampling and analysis of the CIF ashcrete will require that SRS workers be exposed to higher than usual levels of radioactivity. SRS has

proposed to test secondary wastes quarterly and, when process changes occur, to limit radiation exposure to workers.

C.2.5 ADDITIONAL REQUIREMENTS FOR WASTE GENERATED OFFSITE

[REF: R.61-79.264.73(a)(b); 264.13(b)(5), (c)]

Only wastes generated at the SRS will be stored and incinerated at the CIF. Therefore, this section does not apply.

C.2.6 ADDITIONAL REQUIREMENTS FOR FACILITIES HANDLING IGNITABLE, REACTIVE, OR INCOMPATIBLE WASTE

[REF: R.61-79.264.13(b)(6); 264.17]

The CIF will handle ignitable wastes and will be designed and operated to safely handle these wastes. Storage tanks will be provided with an inert gas blanket and a flame arrester upstream of a conservation vent. The tank design will be according to the requirements of the National Fire Protection Association standards regarding grounding and protection from static or lightning discharge. Ignitable wastes will be stored only in containers or tanks that are compatible with the waste; therefore, the only potential source of ignition will be external to the container. "No Smoking" signs will be prominently posted in all areas of the CIF. Open flames or other potential ignition sources will not be permitted in the areas where ignitable wastes are stored. Sparkproof tools will be used on all containers and equipment storing or handling ignitable wastes.

Process knowledge and analytical data will be used to verify that reactive wastes are handled safely and appropriately by the CIF to prevent undesirable reactions. If a process change is made, a waste will be

checked using test methods selected from those listed in Table C-5 based on process knowledge.

Waste characterization data for the waste will be reviewed by reaction chemistry experts who will advise the operations supervisor concerning waste reactivity or incompatibility. This information and the lists of potentially incompatible waste groups from 40 CFR 264 Appendix V will be used as a guide to the proper handling of the waste. Wastes will be mixed only when testing or experience has proven them to be compatible.

Compatibility checks may involve both laboratory testing and a comparison of the information on file for each waste. Laboratory compatibility tests will be performed prior to every addition to a tank unless the tank contains the same material as the waste being added, process knowledge demonstrates that the waste being added is compatible with the waste in the tank, or the tank is empty. If compatibility testing in the laboratory is considered necessary, the procedures will be as follows:

1. Compatibility of liquid wastestreams

   - All compatibility testing operations will take place in a hood. The operation will be carried out so as to protect personnel in the event that a violent exothermic reaction occurs at any time during the process.

   - To determine the compatibility of multicomponent materials, compatibility literature will be used when available; otherwise, material A, for example, will be mixed with material B under the following conditions:

- The total amounts to be mixed (incoming and storage tanks) must be known.

- The amounts to be mixed will be determined by the relative volumes of the receiving tanks and incoming containers. The mixing container will be outfitted with a thermocouple connected to a direct temperature readout, sample ports for collecting noxious or lethal gases, and a stirring mechanism.

- The mixture will then be observed for a designated period of time depending upon what was mixed. During this time, the temperature will be closely monitored as will the appearance of the mixture (e.g., solidification, change in color, miscibility, and any unusual occurrences). Analyses of the gases may be performed if indicated by tests or literature.

2. Compatibility of liquid wastestreams to the incinerator system

   • Coupons fabricated from the same materials used to construct the incinerator feed tanks will be exposed to the blended wastestreams for a designated period of time. During this time, the temperature, observable effects on the coupon (corrosivity, loss of structural integrity), reactivity of the waste with the coupon, and any unusual occurrences will be closely monitored.

A waste will be designated as incompatible if mixing with other wastes or contact with incineration system materials of construction results in any of the following conditions:

- Heat evolution
- Noxious or lethal gas evolution
- Violent reactions

- Dramatic change of state (i.e., solidification)
- Coupon Corrosion

Liquid wastes that are incompatible with other wastes will either be placed in a dedicated tank or will not be accepted. Wastes that are incompatible with the incineration system materials of construction will not be accepted.

The only waste type that is incompatible with the incineration system materials of construction is concentrated fluorinated compounds (fluorocarbons). Routine exposure of hydrogen fluoride created from the combustion of these materials can have a detrimental effect on the fiberglass-reinforced plastic (FRP) components of the air pollution control (APC) system. No concentrated fluorocarbon wastes will be accepted by the CIF. Wastes containing trace levels of fluorocarbons will not present a corrosion potential to the fiberglass components and will be accepted. Tank farm system material of construction compatibility will be fully addressed in the independent engineering assessment to be submitted to SCDHEC for approval.

C.3 Additional Waste Analysis Requirements Pertaining to Land Disposal Restriction

[REF: R.61-79.270.14(b)(3); 264.13(a)(1), (b)(6); 268.7]

As of the expected operational date of the CIF, most wastestreams to be handled by the CIF will be prohibited from land disposal. A few streams may not be prohibited due to an approved case-by-case extension and 1-year renewal or an approved no migration petition. Only a few wastestreams may fit into this category; they will be of general knowledge to the personnel operating the CIF. It is assumed that wastes coming to the CIF will be prohibited and will not meet the treatment standards prior to treatment unless the waste is the subject of an effective case-by-

case extension, a no migration petition, or is a newly listed waste that does not have treatment standards. If a claim is made by a generator that a waste meets the LDR treatment standard prior to treatment, then supporting analysis will be required to be provided to the CIF by the generator.

The following is the general strategy for compliance with the LDR program at the CIF.

The CIF will incinerate solid and liquid wastes generally in batches. The EPA/SCDHEC waste code(s) for each batch of waste incinerated will be assigned to the ash and blowdown that results from the combustion of that batch. The LDR treatment requirements and disposal options for the treated ash and blowdown will be determined by the assigned waste codes. Treated ash and blowdown resulting from incinerating nonhazardous waste may be disposed in an onsite nonhazardous radioactive waste disposal facility. Treated ash and blowdown resulting from the incineration of characteristic hazardous waste may also be disposed in an onsite nonhazardous radioactive waste disposal facility if permissible under applicable LDR regulations. Treated ash and blowdown resulting from incinerating listed hazardous waste will be disposed as hazardous waste in a permitted onsite Subtitle C disposal facility. Ash and blowdown produced after 24 hours of operation have elapsed since ceasing incineration of a batch of waste will no longer carry the waste code(s) of that waste.

A number of the waste codes to be received and treated by the CIF have incineration, deactivation, or neutralization named as the specified technology. Since incineration in the CIF meets these specified technologies and since testing to demonstrate compliance with a specified technology is not required, the act of incineration (accompanied by neutralization of scrubber blowdown) itself demonstrates compliance with the LDR for waste codes naming these specified technologies. Likewise, the specified technology of stabilization will be performed

by the CIF on the waste ash, while stabilization of the blowdown will take place at the M-Area Waste Disposal Facility (Y-Area). This specified technology will also not require analysis to verify that treatment standard has been met.

Other wastes may contain only organic components, both organic and inorganic components, or just inorganic components. The incineration of these wastestreams in a well designed and well operated incinerator is expected to meet all of the LDR treatment standards for the organic components. The inorganic components will be further treated in the stabilization process for the ash and the blowdown.

The analysis for compliance with the treatment standards will be performed on the unsolidified blowdown at the CIF for organics only. The solidified blowdown will be analyzed by the Y-Area for compliance with the remaining inorganic components of the waste. The ash will be solidified and analysis for compliance with both the organic and inorganic components will be performed by the CIF on the ashcrete.

Wastes which have a specified technology other than incineration, deactivation, neutralization or stabilization will not be accepted at the CIF. Newly listed wastes such as new Toxicity Characteristic Leaching Procedure (TCLP) wastes will be accepted at the CIF, but will not have an LDR treatment standard applicable to them (unless there was another waste code already associated with the stream). When treatment standards are promulgated for the newly listed wastes, the CIF will comply with the treatment standards in the same manner as described above.

C.3.1 WASTE CHARACTERISTICS

[REF: R.61-79.264.13(a)(1); 268.7]

Prior to the receipt of a shipment of waste at the CIF, the facility operators will receive a characterization of the waste which will include the following:

- List of all EPA Hazardous Waste Numbers applicable to the waste
- Determination of whether the waste is a wastewater or a nonwastewater
- Identification of all major components of the waste
- Concentration of all major components of the waste
- Description of the waste's origin and present physical form
- Date that the waste was generated.

The above information will be used to determine if the waste is restricted under the LDR and if the waste can be accepted into the CIF. The waste will be accepted into the CIF if the following criteria are met:

- All EPA Hazardous Waste Codes identified are included in Table C-1 of this permit application
- Concentration of all components of the waste are acceptable against criteria for compliance with LDR (e.g., mercury <260 mg/kg; Table C-9)

Table C-9. Acceptance Criteria for Metals in Waste

Antimony	730 mg/kg	Arsenic	50 mg/kg
Barium	100,000 mg/kg	Cadmium	20 mg/kg
Lead	10,000 mg/kg	Chromium	2,500 mg/kg
Mercury	<260 mg/kg	Beryllium	detection
Silver	7,300 mg/kg	Thallium	730 mg/kg

- Waste is compatible with the materials of construction of the CIF
- Wastes are in containers acceptable to the CIF waste feed system.

Upon receipt of a waste, the above information, as well as the date the waste was received into the CIF and the quantity of the waste, will be recorded in the operating record. Either a laboratory analysis of the waste, or data to support process knowledge of the waste, will also be contained in the operating record. Containers of waste will be tracked using a bar code system which will identify the waste in the operating record. The record will keep track of waste that is placed into waste tanks and the dates when waste in each tank has been burned or removed.

Wastes which are subject to LDR will be characterized by the generator no less than once a year, or anytime there is reason to believe that the waste composition has changed.

C.3.1.1 Waste Characteristics: Solvent Wastes and Dioxin-Containing Wastes

[REF: R.61-79.264.13(a)(1); 268.7(a); 268.30; 268.31; 268 Appendix I]

Spent solvent wastes having hazardous waste codes F001, F002, F003, F004, and F005 will be stored and treated at the CIF. Waste generators will assign all applicable EPA hazardous waste codes to each waste as described in Section C.3.1.

Ashcrete and blowdown will be tested quarterly to verify that waste has been treated to below LDR limits. The blowdown will be tested only for organic constituents, while the ashcrete will be tested to verify all LDR limits. Analytical methods for the ashcrete and blowdown are listed in Table C-7. The ashcrete and the blowdown will be tested for the

applicable parameters in 40 CFR 268 to verify compliance with LDR for spent solvents. No testing is necessary for 2-ethoxyethanol or 2-nitropropane in F005 waste. Incineration meets the specific technology for these wastes.

No F020-F023 or F026-F028 dioxin-containing waste will be received, stored, or treated at the CIF. Process knowledge will be used to ensure this waste will not be sent to the CIF.

C.3.1.2 Waste Characteristics: California (CA) List Wastes

[REF: R.61-79.264.13(a)(1); 268.7(a); 268.32]

California listed wastes could be received, stored, and incinerated at the CIF. With the promulgation of the fifth and last major land disposal restriction regulation on May 8, 1990, the CA list becomes nearly obsolete. Upon completion and operation of the CIF, the LDR effective date for all restricted hazardous waste will have passed (except if waste is subject to an approved case-by-case extension or an approved no-migration petition). In this circumstance, only a limited number of wastes will remain to be regulated by the CA list since most wastestreams will have more specific treatment standards that will apply to them. The bulk of the CA list applies to liquid wastes. To satisfy this criteria of the CA list, liquid waste need only to be rendered nonliquid. This will occur as part of the process, by solidifying both the ash waste and the blowdown waste. Demonstration that the wastes are nonliquid will be done on both solidified ash and blowdown using the paint filter test (SW-846, Method 9095).

The CA list will also continue to apply in limited situations to hazardous/PCB wastes that are in liquid form. The CIF will not be accepting any PCB waste.

The CA list could also continue to apply in limited situations where certain characteristic hazardous liquid or nonliquid wastes containing > 1,000 mg/L or > 1,000 mg/kg of halogenated organics are treated. In these limited situations, the following criteria will be met through the CIF treatment processes:

- Wastewater with > 1,000 mg/L but < 10,000 mg/L of halogenated organic contaminants (HOCs) will be treated at the CIF to a concentration of < 1,000 mg/L HOCs before land disposal. This determination will be made through process knowledge.

- Liquid and nonliquid wastes containing > 1,000 mg/L or > 1,000 mg/kg, respectively, will be treated in the incineration phase of the CIF as required by 40 CFR 268.42(a)(2).] Since this is the specified technology for this wastestream, no analytical verification is required.

C.3.1.3 Waste Characteristics: First Third, Second Third, and Third Third Wastes

[REF: R.61-79.264.13(a)(1); 268.7(a); 268.33; 268.34; 40 CFR 268.35]

First Third. Second Third, and Third Third wastes having hazardous waste numbers that appear on Table C-1, will be received, stored, and treated at the CIF. Waste generators will assign hazardous waste numbers to each waste as described in Section C.3.1.

Ashcrete and blowdown will be tested quarterly to verify that the waste has been treated to below LDR limits. Analytical methods for the ashcrete and the blowdown are listed in Table C-7. The ashcrete and

blowdown will be tested for applicable parameters in 40 CFR 268 to verify compliance with LDR for First, Second, and Third Third wastes.

Analysis for a particular constituent in the secondary wastes will only occur if a waste identified with that hazardous waste number had been previously incinerated in the CIF. The CIF operating record will record the numbers of all hazardous wastes which have been incinerated at the CIF.

If a listed waste has been previously burned, but has not been burned for at least two iterations of secondary waste testing, this waste code will not be analyzed for thereafter until that waste is introduced into the incinerator again.

When only the non-wastewater form of a waste has been sent to the incinerator, only the non-wastewater standard will be used for testing and compliance determination. Likewise, when only the wastewater form of a waste has been sent to the incinerator, only the wastewater standard will be used for testing and compliance determination. When both forms (wastewater and non-wastewater) of a waste have been previously incinerated, the most stringent of the two standards will be met. A record of this will be kept in the operating record.

Similarly, constituents for which there are two separate treatment standards (depending upon the hazardous waste number) will be incinerated at the CIF. The most stringent treatment standard for the waste which has previously been incinerated at the CIF will be used. (e.g., the standard for D009 mercury is less stringent than the standard for U151 mercury; the D009 standard will be used until such time as U151 waste is introduced into the CIF. The standard for U151 mercury will then be used until at least two iterations of testing for the secondary wastes have passed.)

Wastes for which the specified technology is incineration, deactivation, stabilization, or neutralization will be treated as required prior to land disposal. These wastes will not be analyzed for in the secondary waste. Deactivation and incineration are performed at the CIF. Stabilization of the blowdown is performed at Y-Area, and stabilization of the ash is performed in the CIF ashcrete unit. Neutralization of acids will take place in the CIF pollution control system. A sodium hydroxide solution is added to the quench and the scrubber solutions to provide neutralization of acid gases coming from the secondary combustion chamber.

The only waste for which the specified technology criterion not met by the above-mentioned methods is the high mercury subcategories of U151 and D009. The specified technology for these mercury subcategories is roasting or retorting, which will not be met in the CIF. For this reason, only low mercury subcategory waste (<260 mg/kg) will be received and treated at the CIF.

C.3.2 ADDITIONAL REQUIREMENTS FOR TREATMENT FACILITIES

[REF: R.61-79.264.13(a)(1); 268.7(b)]

The ashcrete and solidified blowdown will be tested to demonstrate compliance with LDR. The analytical procedures for this testing are provided in Table C-7. Sampling methods for these secondary wastes are included in Table C-8. The treatment residues from the incinerator (ashcrete and blowdown) will be sampled and analyzed at least once every quarter and when significant process changes occur.

Testing for certain metals will be performed on the extract of the waste. The extract will be developed using TCLP analysis. **Non-wastewater solvents will be analyzed using the total constituent concentration.**

Should the treatment residues fail to meet the treatment standards required for land disposal, the following will be done. If the blowdown fails to meet the treatment standards for organic parameters, it will be transferred to the aqueous feed tank and slowly injected into the incinerator. If the ashcrete fails to meet the treatment standards, it will be taken to another onsite facility where one of several options may be used. The ashcrete will either be crushed and washed until it meets treatment standards, or crushed and repackaged so that it may be inserted into the incinerator. The wash water will either be sent to Y-Area for solidification or to the CIF for incineration, based on whether the contamination is organic or inorganic.

C.3.3 ADDITIONAL REQUIREMENTS FOR DISPOSAL FACILITIES

[REF: R.61-79.264.13(a)(1); 268.7(c)]

There are no disposal facilities at the CIF; therefore, this section does not apply.

C.3.4 ADDITIONAL REQUIREMENTS FOR SURFACE IMPOUNDMENTS EXEMPTED FROM LAND DISPOSAL RESTRICTIONS

[REF: R.61-79.264.13(b)(7); 268.4(a)]

There are no surface impoundments at the CIF; therefore, this section does not apply.

C.3.5 REQUIREMENTS FOR LAND DISPOSAL FACILITIES WITH AN APPROVED EXEMPTION OR EXTENSION

[REF: R.61-79.270.14(b)(21)]

No exemptions or case-by-case extensions have been applied for; therefore, this section does not apply.

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