HWMA/RCRA STORAGE and TREATMENT PERMIT

for the

MATERIALS AND FUELS COMPLEX (MFC)

on the

IDAHO NATIONAL LABORATORY

EPA ID NO. ID4890008952

- Hot Fuel Examination Facility (HFEF) (MFC-785)
- Radioactive Scrap and Waste Facility (RSWF) (MFC-771)
- Sodium Components Maintenance Shop (SCMS) (MFC-793, 793C, 793G)
- Sodium Storage Building (SSB) (MFC-703)
- RSWF Staging/Storage Area (RSWF SSA)
- North Fenced Area (NFA)

Effective Date: October 1, 2015

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Book 2 of 2

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ATTACHMENT 2

Section C – Waste Analysis Plan Description
Section C Attachments

EFFECTIVE DATE: October 1, 2015
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CONTENTS

TABLES

ATTACHMENTS

C. WASTE CHARACTERISTICS [IDAPA 58.01.05.008 and 58.01.05.012; 40 CFR 264.13 and 270.14(b)(2)]

In accordance with the requirements of Idaho Administrative Procedures Act (IDAPA) 58.01.05.008 and 58.01.05.012; 40 Code of Federal Regulations (CFR) 264.13 and 270.14(b)(1), this section of the Hazardous Waste Management Act (HWMA)/Resource Conservation and Recovery Act (RCRA) Permit Application describes the chemical and physical characteristics of the hazardous waste / mixed waste (HW/MW) to be received/managed at the Materials and Fuels Complex (MFC) HWMA units, and the waste analysis plan (WAP), including sampling and quality assurance, that will be implemented at each MFC HWMA unit to ensure that the HW/MW are handled in a manner that will protect human health and the environment.

The information provided in this section is organized by subsection as follows:

- Subsection C-1, HW/MW Chemical and Physical Analysis Methods and Requirements
- Subsection C-2, Waste Analysis Plan
- Subsection C-3, Requirements Pertaining to Land Disposal Restrictions (LDR)
- Subsection C-4, MFC HWMA Units Subparts AA, BB and CC Applicability.

C-1 HW/MW Chemical and Physical Analysis Methods and Requirements [IDAPA 58.01.05.012 and 58.01.05.008; 40 CFR 270.14(b)(2) and 264.13(a)]

C-1(a) HW/MW Received/Managed and Services Provided at MFC HWMA Units

The MFC HWMA units will receive/manage solid, liquid, and debris HW/MW in containers, tanks, and at miscellaneous units. A detailed description of each MFC HWMA unit and the types of HW/MW each unit will receive/manage is provided in Attachment 1, Section B, MFC Facility Description. A physical description of each waste type being managed at each HWMU is provided in Attachment C-6. A detailed description of each MFC HWMA unit process (storage and/or treatment) is provided in Attachment 1, Facility Description, Section D, Process Description.

C-1(b) Containerized HW/MW and HW/MW Debris [IDAPA 58.01.05.012; 40 CFR 270.15(b)(1)]

The MFC HWMA units may receive/manage ignitable, reactive, corrosive, toxic, or listed HW/MW (either solid, liquid, or debris) in various-sized containers. Examples of the types of containers that may be received are described in Attachment 1, Facility Description, Section D, Process Description. As there is some variability in the types of HW/MW that each of the MFC HWMA units can receive/manage, the specific waste types are listed in Attachment 1, Part A, for each of the HWMA units.

RSWF staging/storage area and the North Fenced Area (NFA) store RHMW and HW/MW with no free liquids in ISCs, cargo containers and DOT type containers. Radioactive waste is also stored in this area. The RSWF staging/storage area and NFA primarily store waste generated from hot cell activities, as well as from non-nuclear facilities, pending treatment and disposal off-site.

Safety Data Sheets (SDSs) and the Integrated Waste Tracking System (IWTS) profiles describe the chemical and physical characteristics of the ignitable, reactive, corrosive, toxic, and/or listed HW/MW [and/or potential underlying hazardous constituents (UHCs)] that HWMA units currently have in storage (or for the approved waste streams that may typically be received at the HWMA unit). Examples of IWTS profiles representing four typical HW/MW types managed at MFC, and two typical SDSs, are provided in Attachments C-1 and C-2.

C-1(c) HW/MW in Tank Systems [IDAPA 58.01.05.008; 40 CFR 264.191(b)(2) and 264.192(a)(2)]

The MFC HWMA unit that may receive/manage and treat HW/MW in tank systems is the Sodium Components Maintenance Shop (SCMS). The types and forms of HW/MW that the SCMS tanks may receive/store/treat are listed in Attachment 1, Part A.

The HW/MW to be treated in the SCMS tank systems is primarily sodium (Na) and sodium-potassium alloys (Nak). The HW/MW is deactivated in a controlled process via water reaction/water washing, where the ignitable and reactive hazardous waste reacts with air and water ultimately forming a hydroxide solution or sodium hydroxide. The sodium hydroxide solution generated is returned to the scrubber water tank for reuse in the SCMS process. Analytical data and process knowledge were used to determine the possible hazardous constituents of the HW/MW. The only potential HW/MW would be the Universal Treatment Standard (40 CFR 268.40) toxic metals shown in Table C-1.

Table C- 1. Potential inorganic toxic constituents.

Hazardous Constituents	
Antimony	Lead
Arsenic	Mercury
Barium	Nickel
Beryllium	Selenium
Cadmium	Silver
Chromium (total)	Thallium

If the liquid waste generated within the tank system is removed, the HW/MW will be solidified or stabilized to meet UTS and/or disposal facility WAC criteria or sent off-site for treatment and proper disposal.

The SCMS tanks are constructed of stainless steel for corrosion resistance, see Attachment 1, Section D, MFC Process Description, D-4 Tank Systems.

C-2 Waste Analysis Plan [IDAPA 58.01.05.012 and 58.01.05.008; 40 CFR 270.14(b)(3) and 264.13(b) and (c)]

C-2(a) Waste Acceptance Criteria

All HW/MW to be received at a MFC HWMA unit will be required to meet waste specific analysis (characterization) requirements and HWMA unit-specific waste acceptance criteria (WAC), tailored to address HW/MW and radiation hazards, and the safety of workers. The characterization of the HW/MW will be based on several methods or combinations of methods to include sampling and laboratory analysis and, when appropriate, acceptable knowledge. Acceptable knowledge is defined as (1) existing published or documented waste analysis data or studies prepared previously for the HW/MW such as manufacturers' specifications, (2) previous analytical data for the same HW/MW stream, or (3) detailed information on specific HW/MW, such as listed waste (F, P, U) from a specific source. Acceptable knowledge can be used alone or in conjunction with fingerprint analysis and full-scale sampling and laboratory analysis. This strategy for HW/MW analysis is discussed in the guidance document, "Environmental Protection Agency (EPA)

Waste Analysis at Facilities that Generate, Store, Treat and Dispose of Hazardous Waste."[1,2]

When feasible, the preferred method to meet waste analysis (characterization) requirements is to conduct sampling and laboratory analysis. However, there are situations where it may be appropriate to apply acceptable knowledge, such as if HW/MW is a listed waste with a well documented process, if there are unwarranted risks to the health and safety of personnel due to radiation or reactive characteristic HW/MW should a container be opened for sampling, or if the physical nature of the waste does not lend itself to taking a laboratory sample (such as debris, piping).[1 2]

The "Joint Nuclear Regulatory Commission (NRC)/EPA Guidance on Testing Requirements for Mixed Radioactive and Hazardous Wastes"[2] stresses the value of acceptable waste knowledge and the flexibility allowed in testing MW to minimize radiation hazards. The guidance offers the following two strategies for characterizing MW: use a sample of <100 grams, as long as the test is sufficiently sensitive, and use of surrogate material, as long as it is chemically identical to the MW and represents the hazardous constituents expected to be present in the MW.

Once a generator/owner has completed the characterization process, the characterization data will be documented by the generator/owner on the INL IWTS profile, or equivalent. Using this IWTS profile (or an equivalent profile form) is a standard practice among HW/MW generators/owners.

The HW/MW characterization data documented on the IWTS profile includes the following:

- Waste stream-specific information
- Generator waste analysis certification and approval signature
- Physical, chemical, and radiological characteristics
- Regulatory status information (EPA waste numbers, UHCs)
- Waste generation dates, container identification number, and container configurations.

[1] "EPA Waste Analysis at Facilities that Generate, Store, Treat and Dispose of Hazardous Waste" (PB94-96303).

[2] "Joint EPA/NRC Guidance on Testing Requirements for Mixed Radioactive and Hazardous Waste," *Federal Register*, November 20, 1997 (62 FR 62079-62094).

The IWTS profile, or equivalent, is used by the HW/MW generator/owner to:

- Document detailed chemical and physical data for the HW/MW
- Certify the quality of the characterization data they are providing to MFC
- Track the HW/MW from generation through disposal.

The IWTS profile, or equivalent, is also used by the MFC HWMA unit manager receiving the HW/MW to:

- Ensure the HW/MW is adequately characterized prior to receipt for storage or treatment
- Approve the HW/MW for acceptance at the HWMA unit following review
- Track the HW/MW while present in the MFC HWMA unit
- Maintain an inventory of all HW/MW on the MFC site.

Examples of IWTS profiles are provided in Attachment C-1.

Prior to shipment of HW/MW to the HWMA unit, the following activities will occur:

- The generator will provide detailed, certified, characterization data for each HW/MW stream documented on the IWTS profile, or equivalent documentation.
- The generator-certified IWTS data, or equivalent documentation, will be reviewed and approved by the HWMA unit manager, or designee.

All containers of HW/MW accepted at an MFC HWMA unit will be:

- Accepted/managed only if the wastes are known and have the approved EPA hazardous waste numbers (HWNs) identified in Attachment 1, Part A.
- Verified, through visual waste verification (also referred to as "fingerprint analysis"). At the discretion of the HWMA unit manager, on-Site[3] HW/MW may be fingerprint analyzed when the HW/MW is received at an HWMA unit.

[3] On-Site means HW/MW generated at a facility physically located on the INL site or HW/MW from a generator that is a contractor or subcontractor of the INL Management and Operations contractor.

- Labeled with barcode labels and entered in the IWTS database, or equivalent, which will allow tracking of the HW/MW container movements.
- Stored in the MFC HWMA-permitted storage facilities identified in Attachment 1, Facility Description, Section B, MFC Facility Description.
- Managed and stored appropriately in waste-compatible containers and, if applicable, with other compatible wastes.

Fingerprint analysis will verify the contents of an HW/MW container as it is opened prior to connection to a HWMA unit treatment/process system. This analysis will provide additional assurance that incompatible materials will not be accidentally introduced into the HWMA unit systems. A record of each analysis will be maintained as part of the HWMA unit operating records. A further description of the fingerprint analysis is provided in Subsection C-2(f).

The unit specific waste acceptance criteria for each MFC HWMUs is listed in Table C-2.

Table C-2. Unit specific waste acceptance criteria.

Facility	Allowed Waste Types	Allowed EPA Hazardous Waste Codes	Other Waste Acceptance Criteria
HFEF	Ignitable, Corrosive, Reactive, Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver, Endrin, Lindane, Methoxychlor, Toxaphene, 2,4 D, 2,4,5-TP (Silvex), Benzene, Carbon tetrachloride, Chlordane, Chlorobenzene, Chloroform, o-Cresol, m-Cresol, p-Cresol, Cresol, 1,4-Dichlorobenzene, 1,2-Dichloroethane, 1,1-Dichloroethylene, 4-Dinitrotoluene, Heptachlor and its epoxide, Hexachlorobenzene, Hexachlorobutadiene, Hexachloroethane, Methyl ethyl ketone, Nitrobenzene, Pentachlorophenol, Pyridine, Tetrachloroethylene, Trichloroethylene, 2,4,5-Trichlorophenol, 2,4,6-Trichlorolphenol, Vinyl chloride, Spent or used solvents, other listed wastes from non-specific sources, and a variety of both acutely hazardous and toxic chemicals. Solids, liquids, and debris	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, F001, F002, F003, F004, F005, F006, F007, F008, F009, F039, P005, P012, P022, P024, P027, P028, P030, P031, P056, P073, P077, P098, P104, P105, P106, P113, P116, P119, P120, U003, U004, U007, U009, U012, U014, U019, U020, U032, U037, U044, U048, U052, U069, U079 - U081, U083, U084, U102, U103, U108, U116, U118, U120, U122, U123, U127, U128, U131, U133 - U135, U138, U140, U144, U145, U147, U151, U159, U162, U165, U169, U170, U171, U182, U188, U190, U191, U196, U201, U204, U207, U208, U210, U211, U215, U217-U220, U225-U228, U239, U328	None
RSWF	Ignitable, Reactive, Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, (mercury-contaminated solid waste only); Selenium; Silver Solids and debris only	D001, D003, D004, D005, D006, D007, D008, D009, D010, D011	No free liquids (including NaK or Mercury) are allowed in newly received waste

Facility	Allowed Waste Types	Allowed EPA Hazardous Waste Codes	Other Waste Acceptance Criteria
SCMS	SCMS tank storage and treatment system: Ignitable, Corrosive, Reactive, Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver, Na or NaK, and mixed radioactive wastes. Solids, liquids, and debris	D001, D002, D003, D004, D005, D006, D007, D008, D009, D010, D011	None
	SCMS container storage and treatment: Ignitable, Corrosive, Reactive, Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver, Endrin, Benzene, Carbon tetrachloride, Chlorobenzene, Chloroform, Cresol, 1,4-Dichlorobenzene, 1,2-Dichloroethane, 1,1-Dichloroethylene, 2,4-Dinitrotoluene, Hexachlorobenzene, Hexachlorobutadiene, Hexachloroethane, Methyl ethyl ketone, Nitrobenzene, Pentachlorophenol, Pyridine, Tetrachloroethylene, Trichloroethylene, 2,4,6-Trichlorolphenol, Vinyl chloride, Spent or used solvents, other listed wastes from non-specific sources, and hazardous toxic chemical, Na, NaK, Radioactive, and Non-radioactive waste. Solids, liquids, and debris	D001, D002, D003, D004, D005, D006, D007, D008, D009, D010, D011, D012, D018, D019, D021, D022, D026-D030, D032-D040, D042, D043, F001 –F007, F009, P030, P098, P099, P106, U003, U103, U108, U134, U151	None
SSB	Ignitable, Reactive, Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver, Endrin, Benzene, Carbon tetrachloride, Chlorobenzene, Chloroform, Cresol, 1,4-Dichlorobenzene, 1,2-Dichloroethane, 1,1-Dichloroethylene, 2,4-Dinitrotoluene, Hexachlorobenzene, Hexachlorobutadiene, Hexachloroethane, Methyl ethyl ketone, Nitrobenzene, Pentachlorophenol, Pyridine, Tetrachloroethylene, Trichloroethylene, 2,4,6-Trichlorolphenol, Vinyl chloride, Spent or used solvents, other listed wastes from non-specific sources, and hazardous toxic chemical, Na, NaK,	D001, D003, D004, D005, D006, D007, D008, D009, D010, D011, D012, D018, D019, D021, D022, D026-D030, D032-D040, D042, D043, F001 –F007, F009, P030, P098, P099, P106, U003, U103, U108, U134, U151	No corrosive waste (D002)

Facility	Allowed Waste Types	Allowed EPA Hazardous Waste Codes	Other Waste Acceptance Criteria
	Radioactive, and Non-radioactive waste. Solids, liquids, and debris		
RSWF Staging/Storage Area	Ignitable, Reactive, Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver, Endrin, Benzene, Carbon tetrachloride, Chlorobenzene, Chloroform, Cresol, 1,4-Dichlorobenzene, 1,2-Dichloroethane, 1,1-Dichloroethylene, 2,4-Dinitrotoluene, Hexachlorobenzene, Hexachlorobutadiene, Hexachloroethane, Methyl ethyl ketone, Nitrobenzene, Pentachlorophenol, Pyridine, Tetrachloroethylene, Trichloroethylene, 2,4,6-Trichlorolphenol, Vinyl chloride, Spent or used solvents, other listed wastes from non-specific sources, and hazardous toxic chemical, Na, NaK, Radioactive, and Non-radioactive waste. Solids and debris	D001, D003, D004, D005, D006, D007, D008, D009, D010, D011, D012, D018, D019, D021, D022, D026-D030, D032-D040, D042, D043, F001 –F007, F009, P030, P098, P099, P106, U003, U103, U108, U134, U151	No free liquids No contained gases (i.e., pressurized containers)
North Fenced Area	Ignitable, Reactive, Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver, Endrin, Benzene, Carbon tetrachloride, Chlorobenzene, Chloroform, Cresol, 1,4-Dichlorobenzene, 1,2-Dichloroethane, 1,1-Dichloroethylene, 2,4-Dinitrotoluene, Hexachlorobenzene, Hexachlorobutadiene, Hexachloroethane, Methyl ethyl ketone, Nitrobenzene, Pentachlorophenol, Pyridine, Tetrachloroethylene, Trichloroethylene, 2,4,6-Trichlorolphenol, Vinyl chloride, Spent or used solvents, other listed wastes from non-specific sources, and hazardous toxic chemical, Na, NaK, Radioactive, and Non-radioactive waste. Solids and debris	D001, D003, D004, D005, D006, D007, D008, D009, D010, D011, D012, D018, D019, D021, D022, D026-D030, D032-D040, D042, D043, F001 –F007, F009, P030, P098, P099, P106, U003, U103, U108, U134, U151	No free liquids No contained gases (i.e., pressurized containers)

1

C-2(b) HW/MW Analysis Parameters and Rationale [IDAPA 58.01.05.008; 40 CFR 264.13(b)(1)]

The MFC HWMA units may only receive/manage HW/MW that meets the following parameters:

- Has been characterized by the generator/owner in accordance with Subsection C-2(a) and the chemical and physical analysis data and/or acceptable knowledge data is certified by the generator/owner
- Has the EPA HWNs identified in Attachment 1, Part A, and meets the WAC of the HWMA unit that will receive and manage the HW/MW.

The specific parameters and rationale (defined in Table C-3) were chosen to address the following:

- Ensure HWMA unit WAC are met
- Provide adequate and accessible information in case of an emergency
- Ensure proper HW/MW handling, treatment, storage, and disposal
- Meet regulatory requirements.

As discussed in previous subsections, all HW/MW characterization data are documented on the IWTS profile, or equivalent. The HWMA unit manager, or designee, receives the IWTS profiles, or equivalent, for review and approval prior to receiving the HW/MW (i.e., physical and chemical properties are known and documented).

If required by the HWMA unit manager, fingerprint analysis can be chosen to verify HW/MW accepted at the HWMA unit is as expected.

C-2(c) HW/MW Analysis Test Methods [IDAPA 58.01.05.008; 40 CFR 264.13(b)(2)]

HW/MW must be sampled and analyzed in accordance with EPA Method SW-846, or equivalent methods, as listed in Table C-3. MFC may require fingerprint analysis to confirm the reported analysis and data recorded on the IWTS profile, or equivalent documentation.

HWMA unit procedures, or the sampling and analysis plan (SAP) prepared for a specific waste stream, will identify modified EPA SW-846 procedures listed in the NRC/EPA *Federal Register* guidance that can be used. These modifications include, for example, MFC Analytical Laboratory (AL) SW-846 equivalent test methods. MFC modified the EPA SW-846 protocols specifically to reduce personnel radiation

exposure during testing of radioactive samples. The modifications involved decreasing sample sizes and changing test equipment. It is recognized that remote handling limitations may prevent verbatim compliance to the details of the methods described in EPA SW-846. Whenever deviation is necessary, the actual method details must be equal (or superior) to EPA SW-846 details. The rigor and reliability of EPA SW-846 must be maintained whenever an equivalent method is used. Changes to EPA SW-846 or other EPA-recognized methods that do not affect the chemistry, such as minor equipment substitutions or minor differences in the preparation of standards or reagents, are allowed within the scope of SW-846 and do not require agency approval.

1 Table C-3. Waste analysis parameters, methods, and rationale.

Parameter	Method			Rationale (see key)
Physical state	As required			1
Radioactivity	Acceptable knowledge, if appropriate, may be used. Alpha and beta detectors, gamma spectroscopy, etc.			2
Ignitability	EPA SW-846 1010, Pensky-Martens Closed-Cup Method for Determining Ignitability, and/or 1020, Setaflash Closed-Cup Method for Determining Ignitability. Acceptable knowledge, if appropriate, may be used.			1, 3, 4,5
Corrosivity	EPA SW-846 1110, Corrosivity Toward Steel; 9040, pH Electrometric Measurement; and/or 9041, pH Paper. Acceptable knowledge, if appropriate, may be used.			1, 3, 4
Reactivity (cyanides, sulfides)	EPA SW-846 9010, 9013, 9014, 9030, 9031, 9034. Acceptable knowledge, if appropriate, may be used.			1, 3, 4,5
Toxicity	1311, Toxicity Characteristic Leaching Procedure or EPA SW-846 1311, Toxicity Characteristic Leaching Procedure. Acceptable knowledge, if appropriate, may be used.			3, 4
Metals	Hazardous Constituent	EPA SW-846 Method	Measurement Technique	1, 3, 4
	Arsenic	7000, Atomic Absorption Methods.	Hydride	
	Antimony	6010, Inductively Coupled Plasma—Mass Spectrometry, or 7000	ICP/Flame	
	Barium	6010 or 7000	ICP/Flame	
	Beryllium	6010 or 7000	ICP/Flame	
	Cadmium	7000	Furnace	
	Chromium	6010 or 7000	ICP/Flame	
	Lead	6010 or 7000	ICP/Flame	
	Mercury	7000	Cold Vapor	
	Nickel	6010 or 7000	ICP/Flame	
	Selenium	7000	Hydride	
	Silver	6010 or 7000	ICP/Flame	
	Thallium	6010 or 7000	ICP/Flame	
	Acceptable knowledge, if appropriate, may be used.			
Volatile	EPA SW-846 8015, 8010/8240, 8020/8260, or process knowledge			1, 3, 4
Semi-volatile	EPA SW-846 8250/8270 or process knowledge			1, 3, 4
Free liquids	9095, Paint Filter Liquids Test Procedure; EPA SW-846 9095, Paint Filter Liquids Test. Acceptable knowledge, if appropriate, may be used.			1
F,P,U Listed	Acceptable knowledge			1, 3, 4

Key: 1 - Ensure safe waste handling, storage, and/or treatment.
2 - Determine if the waste is HW or MW and any applicable radiological control limits (Hazard-Category-3 threshold quantities must not be exceeded).
3 - Determine if waste is regulated under the HWMA/RCRA.
4 - Determine LDR and treatment standards.
5 – Sodium is ignitable/reactive.

C-2(c)(1) Test Methods for Debris [IDAPA 58.01.05.008; 40 CFR 264.13(b)(2)]

The heterogeneous nature of debris HW/MW streams makes collection of representative samples impractical and, as a result, characterization through sampling and analysis is not a reasonable option. Characterization of the debris HW/MW streams, therefore, relies heavily on generator acceptable knowledge documented on the IWTS profile, or equivalent documentation. EPA has recognized the inherent difficulty of debris characterization by promulgating alternative debris treatment standards based on performance and/or design and operating standards rather than numerical, concentration-based standards. As standard test methods for debris are not available, each debris HW/MW stream treated at the HWMA unit will be evaluated separately.

C-2(d) HW/MW Sampling Methods [IDAPA 58.01.05.008; 40 CFR 264.13(b)(3)]

A SAP will be developed for any waste stream needing verification prior to HW/MW receipt, and, if treated, the SAP will also cover post-treatment sampling of the waste. Sampling will be conducted in accordance with Chapter 9 of SW-846 and approved procedures. In general, where standard samples are collected, the following basic sampling procedure is used:

- Obtain samples using pre-cleaned sample equipment, in accordance with the applicable method.
- Document necessary information in the field record (e.g., location, time, characteristics). Fill sample containers. Uniquely identify and label each sample (Attachment C-3).
- Place containers in a durable ice-filled cooler or container for storage or transport to the laboratory. The sample containers may be wrapped in bubble packing or other protective material before placement in the cooler or container, if necessary.
- Install custody seals to ensure sample integrity (Attachment C-3).
- Complete the chain-of-custody (COC) record, and retain an administrative copy (Attachment C-4).
- Review all paperwork and attach the COC record to the cooler or comparable receptacle.
- Seal the coolers or containers, and mark them in accordance with Department of Transportation and/or procedural requirements.
- Transport samples to the MFC or off-Site analytical laboratory.

C-2(e) Quality Assurance/Quality Control

Quality assurance/quality control (QA/QC) is conducted to obtain defensible and valid data from sampling and analysis events. Defensible and valid data require the implementation of the process of field and laboratory control samples, data validation, performance assessments, and, as necessary, corrective action(s).

C-2(e)(1) Field Control Samples

Control samples are QC samples that are intended to monitor the performance of the sampling event. In accordance with this WAP, the following field control samples may be collected:

- Field duplicates
- Equipment rinsate
- Trip blank-sample.

C-2(e)(2) Laboratory QA/QC

MFC and off-Site analytical laboratories, used for sample analysis of received or treated waste, are required to have an approved QA/QC program. The analytical laboratory QA/QC program provides the guidelines and requirements to achieve QC during sample analysis. Depending on the data end-use and overall data quality objectives (DQOs), the laboratory QA/QC control samples may include:

- Matrix spike
- Matrix duplicate
- Matrix spike duplicate.

C-2(e)(3) Data Validation

Data in the analytical laboratory is validated through the analysis of QC samples, where available and applicable prior to, or concurrent with, the analysis of samples and through the use of control charts (as deemed needed). In addition, depending on the data end-use and overall project DQOs, data validation may include evaluation of the following subjects:

- Completeness of laboratory records with regard to processing of all required samples and analyses
- Implementation of appropriate procedures

- Evaluation of sample analytical data to required detection and quantity
- Evaluation of QC analytical data to applicable control criteria
- Comparison of sample holding times to the required holding times prescribed by this WAP.

All deviations are documented and corrective actions implemented, as necessary.

C-2(e)(4) Corrective Action

Corrective action measures fall into the following two categories:

Project Corrective Action—Corrective actions are performed when the project objectives are not met, when conditions adverse to quality have been identified, or when an assessment of data reveals questionable or unknown data quality. Conditions adverse to quality are identified promptly and corrected as soon as possible. When significant conditions adverse to quality are identified, the causes are determined, and corrective actions to prevent their recurrence are performed and documented.

Laboratory Corrective Actions—The contract laboratory possesses a QA program plan identifying warning, control, and rejection limits and what actions will be taken when the warning, control, and rejection limits are exceeded. Warning conditions may only require more frequent observations of a piece of equipment, while rejection conditions require instrument maintenance and re-analysis of all samples run in the out-of-control condition.

C-2(f) Frequency of Analysis [IDAPA 58.01.05.008; 40 CFR 264.13(b)(4) and 268.45]

Initial Analysis—Prior to acceptance at the HWMA unit, initial analyses (characterization), either through review of analytical data or acceptable knowledge (depending on generator/owner category), will have been completed. Initial analysis will be used to determine waste composition and EPA HWNs.

Fingerprint Analysis—Prior to receipt or treatment at the HWMA unit, fingerprint analysis may be performed (if required by HWMA unit manager) for HW/MW on all containers of HW/MW, as each container is opened. Fingerprint analysis will be used to verify container contents and ensure the HW/MW is as documented on the IWTS profile or equivalent.

Post-Treatment Analysis—Prior to shipment to an appropriate disposal facility, post-treatment sampling and analysis is performed, as appropriate, to ensure the

HW/MW treatment residuals meet LDR and the WAC of the disposal facility. Treated HW/MW will be analyzed for UHCs to ensure they meet Universal Treatment Standards (UTS). All treated HW/MW streams will be analyzed for the hazardous constituents detected during the initial sampling and analysis by the generator/owner and any confirmatory sampling and analyses performed by MFC personnel.

If the UTS limits are not exceeded, no additional sampling and analyses are required to demonstrate compliance with LDR. If the UTS limits are exceeded in any HW/MW stream, an additional sample will be taken from the sampled container. If the backup sample yields the same results, the containers of HW/MW treated in the same batch will be divided into groups of eight or less. Two random samples from each group will be analyzed. The basis for the sampling scheme is based on two samples per drum up to eight drums per day for a batch process. Batch processes are based on the number of drums going through the solidification system per day, which have historically been eight per day. If the UTS limits for the group of containers are again exceeded, that group will be set aside for further treatment. If the UTS limits for the group of containers are not exceeded, that group of containers will be sent to an appropriate disposal facility. In addition, if UTS limits are exceeded the waste can be rejected without further treatment and disposition to an off-site facility for treatment and disposal.

Debris Post-Treatment Analysis—HW/MW must meet standards presented in 40 CFR 268.45. No sampling is required to demonstrate post-treatment standards, although treatment residues resulting after the treatment of debris will be further treated and tested in accordance with this WAP.

C-2(g) Requirements for HW/MW Received from Off-Site Generators/Owners [IDAPA 58.01.05.008; 40 CFR 264.13(b)(5), 264.13(c), and 264.73(b)]

No off-site HW/MW is received at MFC. This section in not applicable.

C-2(h) Requirements for Ignitable, Reactive, or Incompatible HW/MW [IDAPA 58.01.05.008; 40 CFR 264.13(b)(6) and 264.17]

As specified in Attachment 1, Facility Description, Section B, MFC Facility Description, Table B-1, several HWMA units have been designed as storage and/or treatment facilities for ignitable and reactive HW/MW. The ignitable/reactive HW/MW that will be received and managed at the HWMA unit will be segregated during storage and treated separately from HW/MW that are incompatible with the reactive metals (such as HW/MW containing water). In addition, the routine characterization requirements identified in this WAP, and the review and approval

process prior to accepting HW/MW for storage and treatment, are in place to prevent the accidental mixing of incompatible materials. Specific to pressurized containers they will be sorted, segregated and/or repackaged. Pressurized containers may be stored until their removal is practicable for further treatment and disposal at an appropriate TSD Facility.

Additional precautions for ignitable and reactive HW/MW are found in Attachment 6, Section F, Procedures to Prevent Hazards.

C-3 Requirements Pertaining to LDR [IDAPA 58.01.05.008; 40 CFR 264.73 and Part 268]

C-3(a) HW/MW LDR-Related Parameters and Rationale

Generators/owners must test their HW/MW, or an extract derived from the HW/MW, or use acceptable knowledge of the HW/MW (as applicable), to determine if the HW/MW is restricted from land disposal under IDAPA 58.01.05.011 and 40 CFR 268. If the generator/owner determines the HW/MW is a restricted HW/MW that does not meet the applicable treatment standards, the generator must notify the HWMA unit manager, or designee. The LDR require generators to provide notification and certification to the treatment and storage facilities that essentially explains the restrictions applicable to their HW/MW.

Generators/owners will be required to complete and submit an LDR Notification Form prior to shipment of the HW/MW to the off-site HWMA unit. An example of an LDR Notification Form is provided in Attachment C-5. The LDR Notification Form will be used to inform the HWMA unit manager that the shipment contains restricted HW/MW that does not meet the applicable treatment standards set forth in IDAPA 58.01.05.011 and 40 CFR 268, Subpart D, or that exceeds the applicable prohibition levels set forth in IDAPA 58.01.05.011 and 40 CFR 268.32, or RCRA Section 3004(d).

MFC HWMA units that treat HW/MW must sample and analyze the treated HW/MW and/or residues in accordance with the frequency specified in Subsection C-2(f). When analysis results indicate the HW/MW can be land disposed, an LDR Notification will be sent with each HW/MW shipment to the appropriate disposal facility that includes the following information:

- EPA HWNs
- Treatment standards (including the applicable five-letter treatment code listed in IDAPA 58.01.05.011 and 40 CFR 268.42, Table 1) for restricted

waste, either included or referenced by including the applicable non-wastewater category per IDAPA 58.01.05.011 and 40 CFR 268.2(d), the applicable subdivisions made within a waste code based on waste-specific criteria, and the CFR section(s) and paragraph(s) where the applicable treatment standard appears

- Manifest number associated with the shipment of HW/MW
- Waste analysis data, where available.

MFC will also submit a one-time certification with the initial shipment of a restricted HW/MW to the appropriate disposal facility, stating that the HW/MW has been treated in compliance with the applicable performance standards specified in IDAPA 58.01.05.011 and 40 CFR 268, Subpart D. This certification statement will read as stated in IDAPA 58.01.05.011 and 40 CFR 268.7(b) or (d), as applicable. MFC will retain a copy of this certification and update the information if the process changes, or the disposal facility receiving the HW/MW changes".

In addition, MFC will place in its files a one-time notification/certification for waste no longer exhibiting a characteristic in accordance with IDAPA 58.01.05.011 and 40 CFR 268.9(d). This notification and/or certification will also include the applicable UHCs. MFC will retain a copy of this notification/certification and update the information if the process changes, or the disposal facility receiving the HW/MW changes.

C-3(b) HW/MW LDR-Related Analysis Test Methods

Analysis and test methods are identified in Subsection C-2(c).

C-3(c) HW/MW LDR-Related Sampling Methods

Sampling methods are identified in Subsection C-2(d).

C-3(d) HW/MW LDR-Related Frequency of Analysis

Frequency of analysis methods are identified in Subsection C-2(f).

C-4 MFC HWMA Units Subparts AA, BB and CC Applicability [IDAPA 58.01.05.008; 40 CFR 264.1030, 264.1050, and 264.1080]

C-4(a) 40 CFR 264 Subpart AA Applicability

The requirements contained in 40 CFR 264 Subpart AA do not apply, since the MFC HWMA units contain no process vents associated with distillation,

fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations.

C-4(b) 40 CFR 264 Subpart BB Applicability

The requirements contained in 40 CFR 264 Subpart BB do not apply, since the MFC HWMA units have no equipment that contains or contacts hazardous wastes with organic concentrations of at least 10% by weight.

C-4(c) 40 CFR 264 Subpart CC Applicability

The requirements contained in 40 CFR 264 Subpart CC do not apply to the MFC HWMA units, since the MFC HWMA units will only store or treat hazardous waste and hazardous debris that is exempt from 40 CFR 264 Subpart CC, as provided in 40 CFR 264.1080 or 264.1082.

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Attachment C-1

Examples of IWTS Profiles

Integrated Waste Tracking System Material Profile

Information Only

Material Profile Define ANL180CH

Material Profile No.:	ANL180CH
Profile Date:	2/13/1998 12:00:00 AM
Name of Waste or Material:	Debris and Equipment Contaminated with Sodium - Contact Handled
Site Treatment Plan ID:	CH-ANL-180 SODIUM - LLW
Generating Unit (e.g. Building or Process):	MFC-767 : MFC 767 EBR-II Reactor Plant Building
Material or Waste Type and Action:	MLLW: CH, to be treated at the SCMS
Record Status: Inactive	**Record Lock Parameters:** 04/09/1998 06:52:07 GarciaJ
	Insert Parameters: 02/15/1998 12:47:40 iwts

Inactivation allows a record to remain selectable for historical profiles prior to the inactivation date. The inactivation data defaults to the date/time of inactivation, but can be changed to a user defined date/time. A canceled record will not be selectable by past, present, or future records. After a record is cancelled, a historical profile may continue to reference it, but any attempt to update the reference will require a new selection.

Integrated Waste Tracking System Material Profile

Information Only

Certification, Review & Approval ANL180CH

Certified 	Name: Nancy Stewart Date: 08/17/2001 Phone: 2085337399 Fax: 2085337376 E-Mail: Nancy.Stewart@inl.gov	A waste determination process for this waste stream has been performed. Characterization data was derived by approved analytical methods or process knowledge information and any data limitations have been documented. Legally and scientifically defensible data was used for characterization whenever possible. The required data provided in this Material & Waste Characterization Profile is complete and accurate based on the analytical data or process knowledge information used for characterization.
Reviewed 	Name: Nancy Stewart Date: 08/17/2001 Phone: 2085337399 Fax: 2085337376 E-Mail: Nancy.Stewart@inl.gov	A review of the Material and Waste Characterization Profile has shown that a waste determination was performed and that the required profile data is complete and accurate based on the analytical data or process knowledge information provided. The characterization data is sufficient to justify an approval or disapproval for the material or waste to be offered for disposition.
Approved 	Name: Roy Grant Date: 10/15/2001 Phone: 2088812611 Fax: E-Mail: rpgrant@energysolutions.com	The Material and Waste Characterization Profile characterization data meets the INL RRWAC (or a contracted Off-Site Vendors acceptance criteria) for the associated material or waste type and action. A regulatory based disposition is identified for the material or waste defined by this profile. Independent review was performed and comments from the review addressed. Approval to offer this material or waste for disposition is granted.

Last Profile Update and Approval ANL180CH

Update/Approvals 	Name: Jonathan Jacobson Date: 09/13/2012 Phone: 2085337057 Fax: E-Mail: jonathan.jacobson@inl.gov	Waste defined by this Material and Waste Characterization Profile is currently being generated. An update and approval (as defined by the original approval statement) of this profile has been performed per the annual approval requirement established in the IWAC.

	First Name	Last Name	Phone	Fax	E-Mail	Mail Stop
Generator Contact:	Nancy	Stewart	2085337399	2085337376	Nancy.Stewart@inl.gov	6000
Technical Contact:	Roy	Grant	2088812611		rpgrant@energysolutions.com	
Charge No:						

Material Profile Rejection Log ANL180CH

User	Date	Process Rejected	Comments
watsonr	07/05/2001	Approval	Clear approval screen.

Revision History ANL180CH

Char_id	Profile Name	Profile Date	Record Status
ANL180CH	Debris and Equipment Contaminated with Sodium - Contact Handled	02/13/1998	Inactive

Integrated Waste Tracking System Material Profile

Information Only

Material Profile Process ANL180CH

1. Yes **Will material and waste characterization be fully capable of complying with applicable Waste Acceptance Criteria?**

   a. **Waste Acceptance Criteria requirements not met (list each):**

   b. **Receiving organization approval letter number for nonstandard material or waste:**

2. **Waste Generated from:** Routine Operations | **Cleanup/Stabilization Activity:** | **Generating Status:** On-going

   Is this secondary waste?

3. **Generating Process description (describe the process and/or operations generating material, be specific):**

   Debris from facility operations; heavy metal, ignitable, and reactive hazards

   This waste stream was generated at ANL-767, EBR-II Reactor Building during nuclear reactor operations including maintenance activities on control systems. Some maintenance activities in Bldg. 767 involve working on and replacement of sodium wetted equipment associated with the EBR-II cooling systems. If the waste equipment cannot be cleaned of the sodium metal, it is stored in the RSSF or SCMS. Also, the secondary cooling systems at EBR-II occasionally leaked sodium metal. Cleanup operations generated sodium-contaminated wastes.

   This waste stream was and is generated at ANL-767, EBR-II Reactor and ANL-766, Sodium Boiler Building. Currently, the EBR-II Reactor is undergoing closure. The secondary and primary sodium described in waste stream CH-ANL-506 has been pumped from the systems and treated at SPF. Closure activities will generate sodium containing or contaminated waste as components and piping are removed from these systems, and these will be identified as CH-ANL-180. The sodium residual in pipes, components etc. will be treated at Sodium Component Maintenance Shop, Bldg. 793.

4. **Physical state at 70 degrees F:** solid

5. No **Does material contain free liquids?**

6. Yes **Current waste minimization plan?** **Reference:** W0001-1005-OP-03

Special Characteristic ANL180CH

Characteristic
Debris - RCRA

Integrated Waste Tracking System Material Profile

Information Only

Characterization Requirements ANL180CH

1. Yes **Is this DOT regulated hazardous material ?**

   If yes, identify DOT primary hazard: Class 4, Class 7 **and DOT subsidiary hazard(s):** 4.3, dangerous when wet material

2. Yes **At the point of generation did this material contain any RCRA "F", "K", "U", or "P" Listed waste either in pure form, as a mixture, or as a treatment residue (i.e., ash, leachate, spill cleanup), or "D" Characteristic waste?**

   Waste Description: Solid waste from operations, maintenance or cleanup

   Source Code: G13 Other Intermittent Events or Processes: Cleaning out process equipment

   Source Code Comments:

   Form Code: W002 Mixed Media/Debris/Devices: Contaminated debris: paper/clothing/rags/wood, empty containers, glass/piping/other solids

   Form Code Comments:

3. **RCRA hazardous waste determination was made by:** Both

4. No **Does this Material Profile contain Lab Packs?**

5. Yes **Was an Underlying Hazardous Constituent (UHC) determination performed?**

   No **If a UHC determination was performed, were any detected in concentrations exceeding the Universal Treatment Standards? List on UHC Screen.**

6. Yes **Is supporting documentation submitted? If yes, list:**

   EBR-II Primary and Secondary Sodium analysis results are on file at ANL-W in facility operating records.

7. No **Additional narrative:**

8. **Is the material LDR Compliant?**

Generation Active Estimates ANL180CH

Estimate Date	Start Date	End Date	Vol Qty	Vol Units	Mass Qty	Mass Units	Data Entered By	Active	Estimate Type	Inactivated By	Inactivated Date
07/07/1999	01/01/2000	12/31/2000	5	M3	5463	KG	grantr	Yes	CY		
07/07/1999	01/01/2001	12/31/2001	5	M3	5463	KG	grantr	Yes	CY		
08/17/2001	01/01/2002	12/31/2002	2.5	M3	2732	KG	StewartN	Yes	CY		
08/17/2001	01/01/2003	12/31/2003	2.5	M3	2732	KG	StewartN	Yes	CY		
08/17/2001	01/01/2004	12/31/2004	2.5	M3	2732	KG	StewartN	Yes	CY		
08/17/2001	01/01/2005	12/31/2005	2.5	M3	2732	KG	StewartN	Yes	CY		

Integrated Waste Tracking System Material Profile

Information Only

Generation Inactive Estimates ANL180CH

Estimate Date	Start Date	End Date	Vol Qty	Vol Units	Mass Qty	Mass Units	Data Entered By	Active	Est Type	Inactivated By	Inactivated Date
02/16/1998	01/01/1998	12/31/1998	0.02	M3	27	KG	ThiesenTJ	No	CY	grantr	07/07/1999
02/16/1998	01/01/1999	12/31/1999	0.02	M3	27	KG	ThiesenTJ	No	CY	grantr	07/07/1999
10/13/1998	01/01/1998	12/31/1998	0.63	M3	340	KG	StewartNA	No	CY	grantr	07/07/1999
10/13/1998	01/01/1999	12/31/1999	0.63	M3	340	KG	StewartNA	No	CY	grantr	07/07/1999
10/13/1998	01/01/2000	12/31/2000	0.63	M3	340	KG	StewartNA	No	CY	grantr	07/07/1999
10/13/1998	01/01/2001	12/31/2001	0.63	M3	340	KG	StewartNA	No	CY	grantr	07/07/1999
10/13/1998	01/01/2002	12/31/2002	0.63	M3	340	KG	StewartNA	No	CY	grantr	07/07/1999
07/07/1999	01/01/2002	12/31/2002	5	M3	5463	KG	grantr	No	CY	stewartn	08/17/2001
07/07/1999	01/01/2003	12/31/2003	5	M3	5463	KG	grantr	No	CY	stewartn	08/17/2001
07/07/1999	01/01/2004	12/31/2004	5	M3	5463	KG	grantr	No	CY	stewartn	08/17/2001

Layers ANL180CH

Layer or Phase	Physical State at 70 F	Range of Percentage From	To	Units	Color
1	solid	100	100	wt%	various

Physical Characteristics ANL180CH

1. **Density of material or waste (may not be required for hazardous waste and recyclable material):**

   Liquid: **To:** **g/ml** **Solid:** **To:**

2. No **Is this aqueous waste? If yes, give total solids range:**

   From: **To:** **g/ml**

3. No **Is this incinerable liquid? If yes, give viscosity range:**

   From: **To:** **SSU**

Physical Composition ANL180CH

Char. No.	Related Characteristic (Use *Other* Where NA)	Name of Material	Carcinogen	Composition Range From	To	Units
0	*Other*	Alloy Steel	No	25	50	wt%
0	*Other*	Asbestos	No	0	10	wt%
0	*Other*	Halogentated Plastic Debris	No	0	25	wt%
0	*Other*	Mild Steel	No	25	50	wt%
0	*Other*	Sodium Contaminated Scrap Metal	No	0	100	wt%
0	*Other*	Wood/Paper/Rags	No	0	25	wt%
8	Water reactives	sodium metal	No	0	50	wt%

Integrated Waste Tracking System Material Profile

Information Only

Flash Point, Incinerable Properties, and RCRA ANL180CH

1. No **Is flash point applicable? If yes, complete the following:**

   Flash Point: **To:** **Method used:**

   (Specify Other):

2. **Information for incinerable waste only:**

   a. **Heat of combustion:** **To:** **BTU/lb**

   b. **Ash content:** **To:** **wt%**

   c. **Total halogen content:** **To:** **ppm**

   d. **Water content:** **To:** **wt%**

   e. **Suspended particulates content:** **To:** **ppm**

3. Yes **Was a RCRA Waste analysis performed? If yes, enter data using "EPA Codes" screen.**

4. Yes **Were the sampling and analysis protocols used in full compliance with SW-846 protocol or other equivalent regulatory agency approved methods?**

EPA Codes ANL180CH

Hazardous Constituents

			Expected Range			Representative Sample			Detection Limit	
EPA Code ID	**TCLP Value**	**Type of Analysis**	**From**	**To**	**Units**	**From**	**To**	**Units**	**Limit**	**Units**
D001G	No	Process Knowledge	0	10	wt%					
Ignitable Ignitable characteristic wastes, that are managed in non-CWA/non-CWA-equivalent/non-Class I SDWA systems.										
D002I	Yes									
Corrosive - Alkaline Corrosive charac (Alkaline) waste that are managed in non-CWA/non-CWA equivalent/non-Class I SDWA systems										
D003F	No	Process Knowledge	0	10	wt%					
Reactive Water reactives based on 261.23(a)(2),(3), and (4)										

Underlying Hazardous Constituents ANL180CH

	TCLP	Type of	Expected Range			Representative Sample			Detection Limit	
CAS	**Value**	**Analysis**	**From**	**To**	**Units**	**From**	**To**	**Units**	**Limit**	**Units**
7439-92-1	Yes	Both				0	11	ppm		
Lead										

Chemical Composition ANL180CH No Data Available

Integrated Waste Tracking System Material Profile

Information Only

Radiological Characteristics ANL180CH

1. Y **Is fissile material present?** **Is fissile material >=.04 g/kg, waste matrix group is:**
2. **Total transuranic activity per gram of waste is:**
   - Y **<= 10 nCi/g (LLW)**
   - **> 10 nCi/g and <= 100 nCi/g (alpha LLW)**
   - **> 100 nCi/g (TRU)**
3. **Expected radiation dose rate:**

at contact of waste package(s)	0.1	**to**	500	**mrem/hr**
at 30cm from waste package(s)		**to**		**mrem/hr**
at 1-meter from waste package(s)	0.1	**to**	100	**mrem/hr**

4. N **Is the waste greater than Class C as defined in 10 CFR 61.55?**

Isotopes - TRU U233, U-235 ANL180CH

Isotope	Activity Range or Sample Data From	To	Sample	Units		Fissionable Material Range or Sample Data From	To	Sample	Units
Am-241				Ci/m3					nCi/g
Np-237				Ci/m3					nCi/g
Pu-238				Ci/m3					nCi/g
Pu-239		7.000E-04		Ci/m3					g/ft3
Pu-240				Ci/m3					nCi/g
Pu-241				Ci/m3					nCi/g
Pu-242				Ci/m3					nCi/g
U-235				Ci/m3					g/ft3

Integrated Waste Tracking System Material Profile

Information Only

Isotopes - Other ANL180CH

Isotope	Activity Range or Sample Data From	To	Sample	Units
Ag-110m			1.000E+00	nCi/g
Au-198				nCi/g
Ba-137m				nCi/g
Ba-140				nCi/g
Ce-144				nCi/g
Co-58				nCi/g
Co-60			1.000E+02	nCi/g
Cr-51				nCi/g
Cs-134			1.000E+00	nCi/g
Cs-137			1.000E+01	nCi/g
Eu-154				nCi/g
Eu-155				nCi/g
Fe-55				nCi/g
H-3			1.000E+02	nCi/g
I-131				nCi/g
In-113m				nCi/g
La-140				nCi/g
Mn-54			2.000E+00	nCi/g
Na-22			1.000E+02	nCi/g
Na-24				nCi/g
Nb-95				nCi/g
Pm-147				nCi/g
Po-210				nCi/g
Pr-144				nCi/g
Pr-144m				nCi/g
Rh-106				nCi/g
Ru-106				nCi/g
Sb-124				nCi/g
Sb-125			2.000E+00	nCi/g
Sn-113			1.000E+02	nCi/g
Sn-117m				nCi/g
Sr-89				nCi/g
Sr-90			1.000E+01	nCi/g
Te-132				nCi/g
U-238				nCi/g
Y-90				nCi/g

Integrated Waste Tracking System Material Profile

Information Only

Containers ANL180CH

Container Barcode	Container Date	Size	Container Units	Type	Common Name of Materials	Decommissioned
14888K	11/06/1997	55	GAL	DM	Sodium- LLW: Primary sodium contaminated components- individually bagged sodium	Yes
14889K	11/06/1997	55	GAL	DM	Sodium- LLW: Primary sodium contaminated components- individually bagged sodium	Yes
14891K	11/06/1997	55	GAL	DM	Sodium LLW : Primary sodium contaminated components	Yes
14892K	11/07/1997	55	GAL	DM	SODIUM - LLW : EBR-II sodium items from SCMS	Yes
14893K	11/06/1997	55	GAL	DM	Sodium- LLW: Primary sodium contaminated components	Yes
16932K	11/07/1997	55	GAL	DM	SODIUM - LLW- Drum contains 3 bags of Water Wash System Vapor Trap mesh	Yes
16936K	11/14/1997	75	GAL	CW	SODIUM - HFEF: 2 MK-II loops in secondary cans (Loops E-4 and H-2)	No
16937K	11/07/1997	30	GAL	CW	SODIUM - LLW- FTP Hex Tube	Yes
16938K	12/15/1997	20	GAL	CM	Molecular Sieve - Na Vapor Mesh	Yes
16956K	10/17/1997	30	GAL	DM	Sodium plates from ZPPR	Yes
16958K	11/06/1997	52	GAL	CM	SODIUM - LLW- CGCS Aersol Filter	No
16975K	03/26/1998	1	GAL	CM	SODIUM - Sample waste from AL-B-127	Yes
16976K	03/26/1998	1	GAL	CM	SODIUM - AL: RPI/Fermi sample waste	Yes
16991K	12/04/1997	83	GAL	DM	SODIUM - LLW-SLST T-7 experiment	No
16993K	11/07/1997	55	GAL	DM	SODIUM -Contaminated components from EBR-II	Yes
16994K	11/07/1997	55	GAL	DM	SODIUM - LLW-Origin 767. Drum contains individually bagged Na containing/contam. items	Yes
16995K	11/07/1997	55	GAL	DM	SODIUM - LLW: Sodium contaminated components	Yes
17197K	12/15/1997	80	GAL	CM	Charging Tank - bottom drained, residual primary sodium	No
17198K	12/15/1997	24	GAL	CM	ACS Vapor Trap 1	Yes
17211K	01/23/1998	24	GAL	CM	ACS SODIUM VAPOR TRAP	Yes
17212K	01/23/1998	24	GAL	CM	ACS SODIUM VAPOR TRAP	Yes
17213K	01/23/1998	1	GAL	CM	SODIUM -Sodium residue from ACS vapor trap removal.	Yes
17214K	01/28/1998	20	GAL	CM	ACS Molecular Sieve	Yes
17215K	01/27/1998	20	GAL	CM	ACS Molecular Sieve	Yes
17216K	01/27/1998	1	GAL	CM	SODIUM - Residue from molecular sieves	Yes
17222K	06/25/1998	70	GAL	CM	ACS DC Turbine	Yes
17223K	06/25/1998	70	GAL	CM	ACS DC Turbine	Yes
17224K	03/13/1998	20	FT3	CM	Throttle Valve	No
17225K	03/13/1998	20	FT3	CM	Throttle Valve	No
17228K	05/28/1998	39	GAL	CM	EBR-II Failed Failed Fuel Transfer System Extension Tube	Yes
19800P	02/11/1998	2	GAL	CM	Sodium from ACS Vapor Traps removal	Yes

19801P	02/11/1998	2	GAL	CM	Sodium from ACS Vapor Traps removal - Primary sodium	Yes
19802P	07/01/1998	80	GAL	CW	Control Rod Pull Pipe	Yes
19804P	07/19/1998	15	GAL	CM	ACS FUM Vapor Trap	No
19805P	04/05/1998	15	GAL	CM	N-1 Vapor Trap Can	Yes
21009P	07/28/1998	2	GAL	CM	EBR-II Argon Cooling System (ACS) Sodium from the A-3 nozzle removal operations	Yes
21010P	07/28/1998	25	GAL	CM	ACS A-3 Nozzle Outlet Piping	No
21011P	09/01/1998	30	GAL	CM	EBR-II ACS DC Turbine Unit 2 Primary Na	Yes
21026P	10/01/1998	10	GAL	CM	N-1 Nozzle Vapor Trap, No. 1	No
21028P	12/03/1998	1	GAL	CM	EBR-II Secondary Sodium Drain Tank, sodium scrapings from maintenance operations	Yes
21029P	12/03/1998	1	GAL	DM	EBR-II Secondary Sodium Drain Tank, sodium scrapings from Maintenance Operations	Yes
21030P	12/03/1998	1	GAL	CM	SBB Secondary Sodium Storage Tank, 2" pipe 26.5" long with ~1/2-gal of Na	Yes
21031P	10/30/1998	4	GAL	DM	Control Rod Bellows Pipe w/ Primary Na Residue	No
21032P	10/30/1998	4	GAL	DM	Control Rod Bellows Pipe w/ Primary Na Residue.	No
21033P	10/30/1998	4	GAL	DM	Control Rod Bellows Pipe w/ Primary Na Residue.	No
21268P	10/16/1998	55	GAL	CM	Primary Sodium Acoustic Monitor inside wash tube	No
21280P	12/21/1998	55	GAL	DM	Na Contaminated ACS Lines	Yes
21281P	12/21/1998	55	GAL	DM	Na Contaminated ACS Lines	Yes
21282P	12/21/1998	55	GAL	DM	Na Contaminated ACS Lines	Yes
21283P	01/07/1999	1	GAL	CM	~100 g of sodium from SPF spill of Fermi Na in a 1-gal paint can	Yes
21288P	01/27/1999	55	GAL	DM	Piping from the Secondary Sodium Cold Trap Removal	Yes
21289P	01/27/1999	55	GAL	DM	Secondary Sodium Piping from Cold Trap Removal	No
21290P	10/01/1994	116	GAL	CM	EBR-II Secondary Sodium Cold Trap: Includes both sodium and NaK	No
21291P	01/27/1999	50	GAL	CM	Large valve from the secondary sodium tank encased in heat resistant lagging	No
21292P	02/09/1999	1	GAL	CM	Secondary Na Cold Trap removal, 1-gal paint can contains 1/2-gal of Na pieces	Yes
21293P	01/28/1999	2	GAL	CM	2-gal paint can with Na contaminated valves	Yes
21294P	01/28/1999	1	GAL	CM	1-gal paint can, Na Drain Valves.	Yes
21295P	01/28/1999	1	GAL	CM	1-gal paint can with SPF Dip Tube Na valve	Yes
21296P	02/05/1999	55	GAL	DM	Control Rod Drive Pull Pipe (cut up) pieces containing residual Na	Yes
21297P	02/05/1999	20	GAL	CM	Fuel Transfer Port w/ Na Aersol	No
23324P	02/05/1999	30	GAL	CW	Fuel Transfer Port HEX Tube	Yes
23325P	05/26/1999	55	GAL	DM	Secondary Sodium Boiler Building Sampling Station Piping	Yes
23326P	02/09/1999	1	GAL	CM	MLLW Primary Na Piping	No

Integrated Waste Tracking System Material Profile

Information Only

23327P	02/09/1999	2	GAL	DM	MLLW Primary Na FTP Metal Lower Seat	Yes
23333P	02/02/1999	2	GAL	CM	SPF Dip Tubes, 2 tbsp of Na; room for more Na	Yes
23334P	02/02/1999	0	GAL	CM	One plugged sodium valve from melting station at SPF #8 inside a one pint can	Yes
23343P	02/26/1999	3	M3	CW	ACS Heat Exchanger - Primary Na	No
23373P	03/13/1999	1	GAL	CM	Pan containing sand and sodium from EBR-II.	Yes
23374P	05/06/1999	5	GAL	CM	ACS Vapor Trap Mesh Na Contaminated	Yes
23375P	05/06/1999	5	GAL	CM	ACS Vapor Trap Mesh Na Contaminated	Yes
ANL000062	02/04/2000	1	GAL	CM	1-gal Paint can of 1/2 cup of Na from Depressed Area	Yes
ANL000063	02/04/2000	5	GAL	CF	Two Dip Tubes for Connex Fittings from SPF	Yes
ANL000064	02/04/2000	5	GAL	CF	Two Na Dip Tubes for Connex Fittings - from SPF	Yes
ANL000065	02/04/2000	5	GAL	CF	Two Na Dip Tubes for Connex Fittings - from SPF	Yes
ANL000089	04/24/2000	0	GAL	CM	Debris and Equipment Contaminated with Sodium - Contact Handled	Yes
ANL000283	08/18/2000	1	GAL	CM	Secondary Sodium Pieces	Yes
ANL000348	11/15/2000	1	PT	CM	Na TEDs (total of 7 TEDs) in a 1/2 Pint Metal Can	Yes
ANL000446	01/03/2001	55	GAL	DM	Sodium and Sodium Contaminated Piping and Sodium inside a Pipe	Yes
ANL010075	02/06/2001	55	GAL	DM	CGCS Aerosol Filter Assembly with Two Na Contaminated Filters- void space inside the drum	Yes
ANL010200	05/18/2001	64	FT3	CW	Debris and Equipment Contaminated with Sodium - From Plant Closure Activities 12/99-5/01.	Yes
ANL010240	08/27/2001	55	GAL	DM	19 1-gal Paint Cans with 5 pounds of Na (Sized for H2O Washing)	Yes
ANL010306	09/06/2001	36	GAL	CM	FFTF Shipping Container Contaminated w/ Na Aerosol	No
ANL010345	04/26/2002	479	GAL	CW	Vapor Trap (VT-B) and Associated Heaters and Metal Piping	Yes
ANL020023	02/27/2002	30	GAL	DM	Debris and Equipment Contaminated with MEDEC Sodium - ~15-20 grams total	No
ANL020024	03/13/2002	401	GAL	CW	FFTS Shafts Contaminated with Sodium - CS-81-47	No
ANL020025	03/14/2002	653	GAL	CW	H-1 Pulling Pipe Contaminated with Sodium - CS-84-10	Yes
ANL020026	03/14/2002	41	GAL	CW	Shaft Special FFTS Contaminated with Sodium - CS-84-26	No
ANL020027	03/14/2002	449	GAL	CW	Instat Cutters Contaminated with Sodium - CS-88-06	No
ANL020028	03/14/2002	770	GAL	CW	Main Core Gripper Contaminated with Sodium - CS-89-06	No
ANL020029	03/13/2002	53	GAL	CW	FPTF Mandrel and Bellow Assembly - CS-90-04	Yes
ANL020030	03/13/2002	97	GAL	CW	FPTF Shield Tube, Incot Bellows Contaminated with Sodium - CS-90-05	Yes
ANL020406	10/16/2002	8	GAL	DM	FASB MEDEC Tests in Glovebox Debris - 2 filters, 3 empty Na containers, 1 NaCO3	No
ANL030171	03/03/2003	85	GAL	DM	Debris and Equipment Contaminated with Sodium - Contact Handled	Yes

ANL030262	06/03/2003	1	QT	DM	Debris and Equipment Contaminated with Sodium - Contact Handled	Yes
ANL030319	07/14/2003	10	GAL	DM	Debris and Equipment Contaminated with Sodium - Contact Handled	No
ANL030334	06/30/2003	8	GAL	DM	Debris and Equipment Contaminated with Sodium - Contact Handled	Yes
ANL1418	08/26/1994	55	GAL	DM	ETR/SLSF SODIUM DEBRIS	Yes
ANL1419	08/26/1994	55	GAL	DM	ETR/SLSF SODIUM DEBRIS	Yes
ANL1420	08/26/1994	55	GAL	DM	ETR/SLSF LOOP SODIUM	Yes
ANL1421	08/26/1994	59	GAL	CM	OLSS HOLD TANK	No
ANL1422	08/26/1994	2	GAL	CM	VAPOR TRAP	No
ANL1423	08/26/1994	2	GAL	CM	VAPOR TRAP	No
ANL1424	08/26/1994	4	GAL	CM	ELECTROMAGNETIC SODIUM PUMP	Yes
ANL1425	08/26/1994	15	GAL	CM	ETR SLSF Cold Trap	No
ANL1426	08/26/1994	15	GAL	CM	ETR SLSF Cold Trap	No
ANL1427	08/26/1994	21	GAL	CM	SODIUM DRAIN TANK	No
ANL1437	06/22/1982	2	GAL	CM	Miscellaneous elemental Na and waste from A. L. B-127 glove box. Sodium originally from EBR-II primary Na system	No
ANL1438	01/03/1983	5	GAL	CM	EBR-II primary sodium system 1lb. of Na in sand	Yes
ANL1439	01/03/1983	5	GAL	CM	EBR-II primary sodium system - 1 lb. of Na in sand	Yes
ANL1441	01/01/1976	2	GAL	DM	Distilled sodium form analyses of EBR -II primary and secondary sodium samples	Yes
ANL1442	06/22/1982	5	GAL	DM	Miscellaneous elemental sodium and waste from Analytical Laboratory B-127 glove box	Yes
ANL1443	06/22/1982	2	GAL	CM	Miscellaneous elemental sodium and waste from Analytical Laboratory B-127 glove box	Yes
ANL1444	01/03/1983	5	GAL	CM	EBR-II primary sodium system - 1lb. Na in sand	Yes
ANL1445	01/01/1976	2	GAL	DM	Distilled sodium from analyses of EBR -II primary and secondary sodium samples	Yes
ANL1446	04/04/1974	3	GAL	CM	TREAT - Unknown Na amount/use (small pieces <0.01 m dia. unknown quantity)	Yes
ANL1447	01/03/1983	5	GAL	CM	Misc.glove box waste and approx. 1 pound of Primary Sodium	Yes
ANL1448	12/27/1978	15	GAL	CM	Pipe containing Na scrap from TREAT "R" series experiments	No
ANL1449	04/04/1974	20	GAL	DM	TREAT R-3 series waste Na	Yes
ANL1450	04/01/1974	20	GAL	DM	SODIUM (TREAT) 1 to 3 gal. of sodium	Yes
ANL1451	04/02/1993	30	GAL	DM	Sodium Pot In 30. Gal. Drum.	No
ANL1452	12/02/1994	2	GAL	CM	Elemental Sodium.	Yes
ANL1454	12/27/1978	15	GAL	CM	SODIUM - Pipe containing Na scrap from TREAT "R" series experiments	No
ANL1455	04/01/1974	13	GAL	DM	SODIUM-from TREAT inside a 3-gal can	Yes
ANL1456	10/22/1979	13	GAL	DM	Sodium scrap from TREAT "R" series	Yes

ANL1457	05/08/1992	30	GAL	DM	Waste Na metal from FMF, FASB Na spill cleanup materials and FASB Na-contam. metal parts	Yes
ANL1458	04/04/1974	3	GAL	CM	SODIUM-TREAT Unknown amount/use (small pieces <0.01 m dia. unknown quantity)	Yes
ANL1459	06/05/1974	1	FT3	CW	SODIUM - TREAT sodium scrap; R-2,3,4&5 sodium filters	No
ANL1465	09/28/1990	55	GAL	DM	SODIUM/LAGGING	Yes
ANL1466	09/28/1990	55	GAL	DM	SODIUM/LAGGING	Yes
ANL1467	09/28/1990	55	GAL	DM	SODIUM/ASBESTOS	Yes
ANL1468	11/29/1978	11	FT3	CM	SODIUM - TREAT "R" series sodium scrap - Transfer Tank	No
ANL1469	01/01/1976	16	GAL	CM	SODIUM - EBR-II sodium (in beer keg)	No
ANL1470	05/19/1982	0	FT3	CM	SODIUM - TREAT Scrap sodium in metal pipe	No
ANL1475	01/01/1976	1	GAL	CM	SODIUM - FASB Scrap sodium in paint can	Yes
ANL1476	01/01/1976	2	GAL	DM	SODIUM - EBR-II primary and secondary sample waste	Yes
ANL1480	05/19/1982	19	GAL	CM	SODIUM-TREAT Scrap sodium	Yes
ANL1481	05/01/1974	55	GAL	DM	SODIUM-EBR-II Sample/maintenance sodium in paint cans.	Yes
ANL1482	01/01/1976	55	GAL	DM	SODIUM- TREAT Scrap sodium	Yes
ANL1483	01/01/1976	55	GAL	DM	SODIUM-TREAT Scrap sodium	No
ANL1486	01/01/1976	13	GAL	DM	TREAT R-series waste Sodium	No
ANL1487	10/22/1979	13	GAL	DM	TREAT "R" series Sodium	Yes
ANL1488	10/22/1979	13	GAL	DM	TREAT "R" series Sodium	Yes
ANL1489	12/27/1978	13	GAL	CM	TREAT "R" series experiments Sodium	No
ANL1490	01/01/1976	55	GAL	DM	TREAT R-3 series waste Sodium	Yes
ANL1491	01/01/1976	55	GAL	DM	TREAT R-series experiments Sodium	No
ANL1492	01/01/1976	55	GAL	DM	TREAT R-4 series waste Sodium	Yes
ANL1493	01/01/1976	55	GAL	DM	TREAT R-5 experiment Sodium	No
ANL1494	01/09/1978	55	GAL	DM	SODIUM-TREAT Scrap sodium from R-8 U-tube	No
ANL1495	01/08/1990	3	FT3	CM	SODIUM-EBR-II Scrap sodium in metal container	No
ANL1497	09/04/1980	4	FT3	CM	SODIUM-Secondary Cold Trap	No
ANL1529	03/07/1997	5	GAL	CM	SODIUM - FASB Scrap: Rejected TED, sodium pot	Yes
ANL990101	07/13/1999	2	GAL	CM	Secondary Na Parts from the Sampling Station	Yes
ANL990102	07/13/1999	2	GAL	CM	Secondary Na Parts from the Sampling Station	Yes
ANL990103	09/09/1999	1	GAL	CM	SPF Na Supply Lines to Reaction Vessel	Yes
ANL990104	09/09/1999	2	GAL	CM	Na Filter, Na Supply lines to Reaction Vessel	Yes
ANL990105	09/09/1999	2	GAL	CM	Na Supply lines to SPF Reaction Vessel, Na Filter	Yes
ANL990106	09/09/1999	1	GAL	CM	Secondary Sodium Lines in 1-gal paint can	Yes
ANL990107	09/14/1999	18	GAL	CM	Cut Yard Pipe w/ Secondary Sodium Residual	Yes

ANL990108	09/14/1999	18	GAL	CM	Cut Yard Line w/ residual Secondary Sodium	Yes
ANL990109	09/14/1999	1	GAL	CM	2 Small Metal Pipes w/ Residual Secondary Sodium in 1-gal can	Yes
ANL990118	12/15/1999	5	GAL	CM	Primary Na in Sand	Yes
ANL990119	12/03/1999	128	FT3	CW	4'x4'x8' Box of Na Contaminted ACS Piping	Yes
ANL990120	12/15/1999	1	M3	CW	F1 Nozzle w/ Na Aersol	No
ANL990122	12/15/1999	1	M3	CW	Hex Tube w/ Na Aersol	No
ANL990123	12/16/1999	5	GAL	CM	SPD Na Filled Dip Tube	No
CCT	03/19/2003	270	GAL	CM	SPF Caustic Cooling Tank Residual for Radionuclide Inventory Reporting	Yes
DTA	03/19/2003	0	GAL	CM	SPF Day Tank A Residual for Radionuclide Inventory Reporting	Yes
DTB	03/19/2003	0	GAL	CM	SPF Day Tank B Residual for Radionuclide Inventory Reporting	Yes
INEL10174	06/05/1997	45	GAL	CM	Sodium: Secondary sodium pump	No
INEL10175	06/05/1997	45	GAL	CM	Sodium: Secondary sodium pump	No
INEL10176	11/07/1997	55	GAL	DM	SODIUM - Sodium waste in 10 2-gallon paint cans inside this drum.	No
MFC080147	06/16/2008	300	GAL	IP	Debris and Equipment Contaminated with Sodium - Contact Handled	Yes
MFC090025	02/05/2009	0	M3	DM	Debris and Equipment Contaminated with Sodium - Contact Handled	No
MFC090168	07/24/2009	0	M3	DM	Debris and Equipment Contaminated with Sodium - Contact Handled	Yes
MFC100112	04/12/2010	85	GAL	DM	TREAT R-3 series waste Sodium	No
MFC100113	04/12/2010	85	GAL	DM	Sodium - LLW:EBR-II sodium items from SCMS	No
MFC120095	09/10/2012	85	GAL	DM	Debris and Equipment Contaminated with Sodium - Contact Handled	No
MFC130132	07/08/2013	85	GAL	DM	Debris and Equipment Contaminated with Sodium - Contact Handled	No
SST	03/19/2003	1	GAL	CM	SPF Sodium Storage Tank Residual for Radionuclide Inventory Reporting	Yes
TL	03/20/2003	80	GAL	CM	Debris and Equipment Contaminated with Sodium - Contact Handled	Yes

Comments ANL180CH No Data Available

Quality Record ANL180CH

Screen	Column	Trans. Type	Before Change	After Change	Reason for Change	Inserted By	Insert Date
Process	Generating Process Description	Update	This waste stream was generated at ANL-767, EBR-II Reactor Building during nuclear reactor operations including maintenance activities on control systems.	Sodium contaminated debris from reactor operations; heavy metal, ignitable, and reactive hazards This waste stream was generated at ANL-767, EBR-II Reactor	Update the Generating Process Description first line to meet the Biennial Hazardous Waste Report requirements.	TygerG	11/02/2001

Some maintenance activities in Bldg. 767 involve working on and replacement of sodium wetted equipment associated with the EBR-II cooling systems. If the waste equipment cannot be cleaned of the sodium metal, it is stored in the RSSF or SCMS. Also, the secondary cooling systems at EBR-II occasionally leaked sodium metal. Cleanup operations generated sodium-contaminated wastes. This waste stream was and is generated at ANL-767, EBR-II Reactor and ANL-766, Sodium Boiler Building. Currently, the EBR-II Reactor is undergoing closure. The secondary and primary sodium described in waste stream CH-ANL-506 has been pumped from the systems and treated at SPF. Closure activities will generate sodium containing or contaminated waste as components and piping are removed from these systems, and these will be identified as	Building during nuclear reactor operations including maintenance activities on control systems. Some maintenance activities in Bldg. 767 involve working on and replacement of sodium wetted equipment associated with the EBR-II cooling systems. If the waste equipment cannot be cleaned of the sodium metal, it is stored in the RSSF or SCMS. Also, the secondary cooling systems at EBR-II occasionally leaked sodium metal. Cleanup operations generated sodium-contaminated wastes. This waste stream was and is generated at ANL-767, EBR-II Reactor and ANL-766, Sodium Boiler Building. Currently, the EBR-II Reactor is undergoing closure. The secondary and primary sodium described in waste stream CH-ANL-506 has been pumped from the systems and treated at SPF. Closure activities will generate sodium

			CH-ANL-180. The sodium residual in pipes, components etc. will be treated at Sodium Component Maintenance Shop, Bldg. 793.	containing or contaminated waste as components and piping are removed from these systems, and these will be identified as CH-ANL-180. The sodium residual in pipes, components etc. will be treated at Sodium Component Maintenance Shop, Bldg. 793.			
Process	Generating Process Description	Update	Sodium contaminated debris from reactor operations; heavy metal, ignitable, and reactive hazards This waste stream was generated at ANL-767, EBR-II Reactor Building during nuclear reactor operations including maintenance activities on control systems. Some maintenance activities in Bldg. 767 involve working on and replacement of sodium wetted equipment associated with the EBR-II cooling systems. If the waste equipment cannot be cleaned of the sodium metal, it is stored in the RSSF or SCMS. Also, the secondary cooling systems at EBR-II occasionally	Debris from facility operations; heavy metal, ignitable, and reactive hazards This waste stream was generated at ANL-767, EBR-II Reactor Building during nuclear reactor operations including maintenance activities on control systems. Some maintenance activities in Bldg. 767 involve working on and replacement of sodium wetted equipment associated with the EBR-II cooling systems. If the waste equipment cannot be cleaned of the sodium metal, it is stored in the RSSF or SCMS. Also, the secondary cooling systems at EBR-II occasionally leaked sodium	Update the Generating Process Description first line to meet the Biennial Hazardous Waste Report requirements and update the source code.	TygerG	11/14/2001

				leaked sodium metal. Cleanup operations generated sodium-contaminated wastes. This waste stream was and is generated at ANL-767, EBR-II Reactor and ANL-766, Sodium Boiler Building. Currently, the EBR-II Reactor is undergoing closure. The secondary and primary sodium described in waste stream CH-ANL-506 has been pumped from the systems and treated at SPF. Closure activities will generate sodium containing or contaminated waste as components and piping are removed from these systems, and these will be identified as CH-ANL-180. The sodium residual in pipes, components etc. will be treated at Sodium Component Maintenance Shop, Bldg. 793.	metal. Cleanup operations generated sodium-contaminated wastes. This waste stream was and is generated at ANL-767, EBR-II Reactor and ANL-766, Sodium Boiler Building. Currently, the EBR-II Reactor is undergoing closure. The secondary and primary sodium described in waste stream CH-ANL-506 has been pumped from the systems and treated at SPF. Closure activities will generate sodium containing or contaminated waste as components and piping are removed from these systems, and these will be identified as CH-ANL-180. The sodium residual in pipes, components etc. will be treated at Sodium Component Maintenance Shop, Bldg. 793.		
EPA Codes	EPA Code ID	Insert		D002I	Add D002I for caustic Cooling Tank that has residual NaOH in it in SPF for fissile inventory.	StewartN	03/20/2003
Isotopes-TRU	Isotope	Insert		Am-241	Sodium contaminated with Am-241	TumageJ	06/04/2003
Isotopes-TRU	Isotope	Insert		Np-237	Sodium contaminated with Np-237	TumageJ	06/04/2003
Isotopes-Other	Isotope	Insert		U-238	To add U238	StewartN	06/25/2003
Define	Record Status	Update	1	2	Inactivate per Jason Orme	WatersM	12/14/2006
Define	Record Status	Update	2	1	Resuming waste treatment	ZahnT	06/18/2008
Isotopes-TRU	Isotope	Insert		Pu-238	update	AllenRB	07/08/2009
Isotopes-TRU	Isotope	Insert		Pu-240	update	AllenRB	07/08/2009

Integrated Waste Tracking System Material Profile

Information Only

Quality Record ANL180CH

Screen	Column	Trans. Type	Before Change	After Change	Reason for Change	Inserted By	Insert Date
Isotopes-TRU	Isotope	Insert		Pu-241	update	AllenRB	07/08/2009
Isotopes-TRU	Isotope	Insert		Pu-242	update	AllenRB	07/08/2009
Isotopes-Other	Isotope	Insert		Eu-154	update	AllenRB	07/08/2009
Composition	Name of Material	Insert		Sodium Contaminated Scrap Metal: 0	update	AllenRB	07/09/2009
Isotopes-TRU (Am-241)	Activity Units	Update	nCi/g	Ci/m3	update	AllenRB	07/10/2009
Isotopes-TRU (Np-237)	Activity Units	Update	nCi/g	Ci/m3	update	AllenRB	07/10/2009
Isotopes-TRU (Pu-238)	Activity Units	Update	nCi/g	Ci/m3	update	AllenRB	07/10/2009
Isotopes-TRU (Pu-239)	Activity Units	Update	nCi/g	Ci/m3	update	AllenRB	07/10/2009
Isotopes-TRU (Pu-240)	Activity Units	Update	nCi/g	Ci/m3	update	AllenRB	07/10/2009
Isotopes-TRU (Pu-241)	Activity Units	Update	nCi/g	Ci/m3	update	AllenRB	07/10/2009
Isotopes-TRU (Pu-242)	Activity Units	Update	nCi/g	Ci/m3	update	AllenRB	07/10/2009
Isotopes-TRU (U-235)	Activity Units	Update	nCi/g	Ci/m3	update	AllenRB	07/10/2009
Isotopes-Other (Ag-110m)	Activity Sample Data	Update		6e-6	update	AllenRB	07/10/2009
Isotopes-Other (Ag-110m)	Activity Sample Data	Update	6.0E-6	6.0E-1	update	AllenRB	07/10/2009
Isotopes-Other (Ag-110m)	Activity Sample Data	Update	0.6	1.	update	AllenRB	07/10/2009
Isotopes-Other (Cs-134)	Activity Sample Data	Update		1	update	AllenRB	07/10/2009
Isotopes-Other (Cs-137)	Activity Sample Data	Update		2	update	AllenRB	07/10/2009
Isotopes-Other (H-3)	Activity Sample Data	Update		10	update	AllenRB	07/10/2009
Isotopes-TRU (Pu-239)	Activity Range to	Update		7e-4	update	AllenRB	07/10/2009
Isotopes-Other (Na-22)	Activity Sample Data	Update		10	update	AllenRB	07/10/2009
Isotopes-Other (Sb-125)	Activity Sample Data	Update		2	update	AllenRB	07/10/2009
Isotopes-Other (Sn-113)	Activity Sample Data	Update		10	update	AllenRB	07/10/2009
Isotopes-Other (Mn-54)	Activity Sample Data	Update		2	update	AllenRB	07/10/2009
Isotopes-Other (Sr-90)	Activity Sample Data	Update		10	update	AllenRB	07/10/2009
Isotopes-Other (Cs-137)	Activity Sample Data	Update	2	10	update	AllenRB	07/10/2009
Isotopes-Other (H-3)	Activity Sample Data	Update	10	100	update	AllenRB	07/10/2009
Isotopes-Other (Na-22)	Activity Sample Data	Update	10	100	update	AllenRB	07/10/2009
Isotopes-Other (Sn-113)	Activity Sample Data	Update	10	100	update	AllenRB	07/10/2009
Isotopes-Other (Co-60)	Activity Sample Data	Update		100	update	AllenRB	07/10/2009
Define	Record Status	Update	2	1	activate the material profile	WinderTA	04/15/2010

Integrated Waste Tracking System Material Profile

Information Only

Quality Record ANL180CH

Screen	Column	Trans. Type	Before Change	After Change	Reason for Change	Inserted By	Insert Date
Define	Record Status	Update	2	1	update	JacobsonJ	09/13/2012

Edit Log ANL180CH

Explanation and References

Name/Date/Time	Explanation
IWTS 09/15/2013 00:00:00	Material Profile inactivated on 2013-09-15 due to lack of yearly reapproval.
JacobsonJ 09/13/2012 12:45:31	Material Profile: ANL180CH BEGIN VALIDATION FOR MATERIAL PROFILE ANNUAL REVIEW JACOBSONJ. WGS-BEA. Call Point-7. Authorized on Generating Unit (ANL767). RAD DATA VALIDATION PASSED HAZ DATA VALIDATION EPA CODES PASSED SOURCE CODE/FORM CODE PASSED WASTE DESCRIPTION PASSED SITE TREATMENT PLAN VALIDATION PASSED COMPOSITION VALIDATION PASSED OVERALL VALIDATION PASSED
jacobsonj 09/13/2012 12:45:24	update
JacobsonJ 09/13/2012 12:45:17	JACOBSONJ. WGS-BEA. Call Point-4. Authorized on Generating Unit (ANL767).
IWTS 04/18/2010 00:00:00	Material Profile inactivated on 2010-04-18 due to lack of yearly reapproval.
winderta 04/15/2010 07:20:21	activate the material profile
WinderTA 04/15/2010 07:20:04	WINDERTA. WGS-BEA. Call Point-4. Authorized on Generating Unit (ANL767).
IWTS 12/13/2009 00:00:00	Material Profile inactivated on 2009-12-13 due to lack of yearly reapproval.
AllenRB 07/10/2009 14:05:28	ALLENRB. WGS. Call Point-4. Authorized on Generating Unit (ANL767).
allenrb 07/10/2009 14:01:36	update
AllenRB 07/10/2009 11:44:01	ALLENRB. WGS. Call Point-4. Authorized on Generating Unit (ANL767).
allenrb 07/10/2009 11:40:13	update nuclide data
AllenRB 07/09/2009 08:15:03	ALLENRB. WGS. Call Point-4. Authorized on Generating Unit (ANL767).
allenrb 07/09/2009 08:11:12	update
AllenRB 07/08/2009 16:08:12	ALLENRB. WGS. Call Point-4. Authorized on Generating Unit (ANL767).
allenrb 07/08/2009 16:04:25	add nuclides
zahnt 06/18/2008 12:33:11	Reactivate
ZahnT 06/18/2008 12:32:56	ZAHNT. MFC. Call Point-4. Authorized on Generating Unit (ANL767).
watersm 12/14/2006 14:36:54	Inactivate per Jason Orme
WatersM 12/14/2006 14:36:50	WATERSM. SITE_ADMIN. Call Point-4. Authorized on Generating Unit (ANL767).
StewartN 06/25/2003 08:26:17	STEWARTN. ANL. Call Point-4. Authorized on Generating Unit (ANL767).

Integrated Waste Tracking System Material Profile

Information Only

Edit Log ANL180CH

Explanation and References

Name/Date/Time	Explanation
stewartn 06/25/2003 08:26:10	add U238
StewartN 06/05/2003 15:31:01	STEWARTN. ANL. Call Point-4. Authorized on Generating Unit (ANL767).
stewartn 06/05/2003 15:30:42	Remove D002I
TurnageJ 06/04/2003 11:26:58	TURNAGEJ. DATA_ENTRY. Call Point-4. Authorized on Generating Unit (ANL767).
TurnageJ 06/04/2003 11:26:39	Add radionuclides
stewartn 03/20/2003 08:02:43	Add D002I for caustic Cooling Tank that has residual NaOH in it in SPF for fissile inventory.
StewartN 03/20/2003 07:59:36	STEWARTN. ANL. Call Point-4. Authorized on Generating Unit (ANL767).
tygerg 11/14/2001 08:33:48	Update the Generating Process Description first line to meet the Biennial Hazardous Waste Report requirements and update the source code.
TygerG 11/14/2001 08:22:15	TYGERG. WGS. Call Point-4. Authorized on Generating Unit (ANL767).
tygerg 11/02/2001 10:13:06	Update the Generating Process Description first line to meet the Biennial Hazardous Waste Report requirements.
TygerG 11/02/2001 10:02:04	TYGERG. WGS. Call Point-4. Authorized on Generating Unit (ANL767).
GrantR 10/15/2001 12:10:04	BEGIN VALIDATION FOR MATERIAL PROFILE APPROVE GRANTR. ANL. Call Point-7. Authorized on Generating Unit (ANL767). RAD DATA VALIDATION PASSED HAZ DATA VALIDATION SOURCE CODE/FORM CODE PASSED EPA CODES PASSED SITE TREATMENT PLAN VALIDATION PASSED COMPOSITION VALIDATION PASSED OVERALL VALIDATION PASSED
grantr 10/15/2001 11:57:55	Text changes in General Information - 7. Generating process description; marking "no" on 16a.; removinglead from list on Characteristics , line 2.d. since the waste will not be incinerated.
GrantR 10/15/2001 11:51:45	GRANTR. ANL. Call Point-4. Authorized on Generating Unit (ANL767).
StewartN 08/17/2001 10:53:30	BEGIN VALIDATION FOR MATERIAL PROFILE REVIEW STEWARTN. ANL. Call Point-6. Authorized on Generating Unit (ANL767). RAD DATA VALIDATION PASSED HAZ DATA VALIDATION SOURCE CODE/FORM CODE PASSED EPA CODES PASSED SITE TREATMENT PLAN VALIDATION PASSED COMPOSITION VALIDATION PASSED OVERALL VALIDATION PASSED

Edit Log ANL180CH

Explanation and References

Name/Date/Time	Explanation
StewartN 08/17/2001 10:53:23	BEGIN VALIDATION FOR MATERIAL PROFILE CERTIFY STEWARTN. ANL. Call Point-5. Authorized on Generating Unit (ANL767). RAD DATA VALIDATION PASSED HAZ DATA VALIDATION SOURCE CODE/FORM CODE PASSED EPA CODES PASSED SITE TREATMENT PLAN VALIDATION PASSED COMPOSITION VALIDATION PASSED OVERALL VALIDATION PASSED
stewartn 08/17/2001 10:47:05	update
StewartN 08/17/2001 10:46:19	STEWARTN. ANL. Call Point-4. Authorized on Generating Unit (ANL767).
WatsonR 07/05/2001 15:36:33	WATSONR. ANL. Call Point-4. Authorized on Generating Unit (ANL767).
watsonr 07/05/2001 15:35:36	Clear approval screen.
stewartn 05/21/2001 16:06:59	add radionuclides
stewartn 05/21/2001 16:05:06	STEWARTN. ANL. Call Point-4. Authorized on Generating Unit (ANL767).
stewartn 04/18/2001 15:52:44	Update source and form codes for the biennial report.
stewartn 04/18/2001 15:51:48	STEWARTN. ANL. Call Point-4. Authorized on Generating Unit (ANL767).
stewartn 06/21/2000 10:21:04	add Ba-137m & Y-90
stewartn 06/21/2000 10:20:55	STEWARTN. wgs. Call Point-4. Authorized on Generating Unit (ANL767).
grantr 07/07/1999 11:25:24	five yr forecast and general check
grantr 07/07/1999 11:25:00	GRANTR. generator. Call Point-4. Authorized on Generating Unit (ANL767). Overall Authorization Passed.
StewartNA 10/13/1998 13:10:37	STEWARTNA. GI. Call Point-5. Authorized on Unit. Authorized on Action. Overall Authorization Passed.
StewartNA 10/13/1998 13:10:33	STEWARTNA. GI. Call Point-6. Authorized on Unit. Authorized on Action. Overall Authorization Passed.
StewartNA 10/13/1998 13:10:27	NAS didn't finish approval process. Database moved to ANL180RH in Radionuclide section? Approval to allow container transfers from 793 to 797.
StewartNA 10/13/1998 13:09:03	STEWARTNA. GI. Call Point-4. Authorized on Unit. Authorized on Action. Overall Authorization Passed.
StewartNA 10/13/1998 12:37:18	NAS is reviewing and updating profile to approve and certify the information to allow container transfers from SCMS - 793 to RSSF - 797.
StewartNA 10/13/1998 12:36:01	STEWARTNA. GI. Call Point-4. Authorized on Unit. Authorized on Action. Overall Authorization Passed.
GarciaJ 04/09/1998 06:52:05	GARCIAJ. SITE_ADMIN. Authorized.
GarciaJ 04/09/1998 06:51:53	GARCIAJ. SITE_ADMIN. Authorized.
ThiesenTJ 02/17/1998 11:51:33	THIESENTJ. GENERATOR. Call Point-2. Authorized on Unit. Authorized on Action.
ThiesenTJ 02/17/1998 11:51:30	THIESENTJ. GENERATOR. Call Point-3. Authorized on Unit. Authorized on Action.

Integrated Waste Tracking System Material Profile

Information Only

Material Profile Define ANL182CH

Material Profile No.:	ANL182CH
Profile Date:	2/16/1998 3:59:11 PM
Name of Waste or Material:	Debris or Equipment Contaminated with Sodium-Potassium (NaK) Alloy
Site Treatment Plan ID:	CH-ANL-182 SODIUM POTASSIUM NaK
Generating Unit (e.g. Building or Process):	MFC-767 : MFC 767 EBR-II Reactor Plant Building
Material or Waste Type and Action:	MLLW: CH, to be treated at the SCMS
Record Status: Inactive	**Record Lock Parameters:** 04/09/1998 06:53:38 GarciaJ
	Insert Parameters: 02/16/1998 15:57:56 ThiesenTJ

Inactivation allows a record to remain selectable for historical profiles prior to the inactivation date. The inactivation data defaults to the date/time of inactivation, but can be changed to a user defined date/time. A canceled record will not be selectable by past, present, or future records. After a record is cancelled, a historical profile may continue to reference it, but any attempt to update the reference will require a new selection.

Integrated Waste Tracking System Material Profile

Information Only

Certification, Review & Approval ANL182CH

Certified 	Name: Nancy Stewart Date: 08/17/2001 Phone: 2085337399 Fax: 2085337376 E-Mail: Nancy.Stewart@inl.gov	A waste determination process for this waste stream has been performed. Characterization data was derived by approved analytical methods or process knowledge information and any data limitations have been documented. Legally and scientifically defensible data was used for characterization whenever possible. The required data provided in this Material & Waste Characterization Profile is complete and accurate based on the analytical data or process knowledge information used for characterization.
Reviewed 	Name: Nancy Stewart Date: 08/17/2001 Phone: 2085337399 Fax: 2085337376 E-Mail: Nancy.Stewart@inl.gov	A review of the Material and Waste Characterization Profile has shown that a waste determination was performed and that the required profile data is complete and accurate based on the analytical data or process knowledge information provided. The characterization data is sufficient to justify an approval or disapproval for the material or waste to be offered for disposition.
Approved 	Name: Roy Grant Date: 10/15/2001 Phone: 2088812611 Fax: E-Mail: rpgrant@energysolutions.com	The Material and Waste Characterization Profile characterization data meets the INL RRWAC (or a contracted Off-Site Vendors acceptance criteria) for the associated material or waste type and action. A regulatory based disposition is identified for the material or waste defined by this profile. Independent review was performed and comments from the review addressed. Approval to offer this material or waste for disposition is granted.

Last Profile Update and Approval ANL182CH

Update/Approvals	Name: Date: Phone: Fax: E-Mail:	

	First Name	Last Name	Phone	Fax	E-Mail	Mail Stop
Generator Contact:	Nancy	Stewart	2085337399	2085337376	Nancy.Stewart@inl.gov	6000
Technical Contact:	Roy	Grant	2088812611		rpgrant@energysolutions.com	
Charge No:						

Material Profile Rejection Log ANL182CH

User	Date	Process Rejected	Comments
watsonr	07/05/2001	Approval	clear approval screen.

Revision History ANL182CH

Char_id	Profile Name	Profile Date	Record Status
ANL182CH	Debris or Equipment Contaminated with Sodium-Potassium (NaK) Alloy	02/16/1998	Inactive

Integrated Waste Tracking System Material Profile

Information Only

Material Profile Process ANL182CH

1. Yes **Will material and waste characterization be fully capable of complying with applicable Waste Acceptance Criteria?**

   a. **Waste Acceptance Criteria requirements not met (list each):**

   b. **Receiving organization approval letter number for nonstandard material or waste:**

2. **Waste Generated from:** **Cleanup/Stabilization Activity:** **Generating Status:**

   Routine Operations On-going

   Is this secondary waste?

3. **Generating Process description (describe the process and/or operations generating material, be specific):**

   Liquid waste from reactor maintenance; heavy metal, ignitable and reactive hazards.

   This waste stream was generated at ANL-767, EBR-II Reactor Building during routine maintenance activities on control systems. Specifically, spent cold traps and bubble pots had auxilliary cooling systems that circulated NaK as a heat exchange (cooling) medium. The traps and pots were designed to remove impurities in the argon cover gas system of the EBR-II. During Plant Closure Project activities NaK containing waste is being generated and entered into the container IWTS. D001 waste number is included in the event that one item has sodium contamination with NaK in a separate tube/container. Chromium has been detected in containers holding Nak, so a D007 waste code has been added.

4. **Physical state at 70 degrees F:** liquid

5. Yes **Does material contain free liquids?**

6. Yes **Current waste minimization plan?** **Reference:** W0001-1005-OP-03

Special Characteristic ANL182CH

Characteristic
Debris - RCRA

Integrated Waste Tracking System Material Profile

Information Only

Characterization Requirements ANL182CH

1. Yes **Is this DOT regulated hazardous material ?**

   If yes, identify DOT primary hazard: Class 4, Class 7 **and DOT subsidiary hazard(s):** 4.2 Spontaneously Combustible

2. Yes **At the point of generation did this material contain any RCRA "F", "K", "U", or "P" Listed waste either in pure form, as a mixture, or as a treatment residue (i.e., ash, leachate, spill cleanup), or "D" Characteristic waste?**

   Waste Description:

   Source Code: G13 Other Intermittent Events or Processes: Cleaning out process equipment

   Source Code Comments:

   Form Code: W119 Inorganic Liquids: Other inorganic liquid

   Form Code Comments:

3. **RCRA hazardous waste determination was made by:** Both

4. No **Does this Material Profile contain Lab Packs?**

5. Yes **Was an Underlying Hazardous Constituent (UHC) determination performed?**

   Yes **If a UHC determination was performed, were any detected in concentrations exceeding the Universal Treatment Standards? List on UHC Screen.**

6. Yes **Is supporting documentation submitted? If yes, list:**

   Sample records are maintained in the Facility Operating Record. Analytical Sample Record # 082372 shows the chromium level in Container ANL010212.

7. No **Additional narrative:**

8. **Is the material LDR Compliant?**

Generation Active Estimates ANL182CH

Estimate Date	Start Date	End Date	Vol Qty	Vol Units	Mass Qty	Mass Units	Data Entered By	Active	Estimate Type	Inactivated By	Inactivated Date
08/17/2001	01/01/2001	12/31/2001	0.21	M3	182	KG	StewartN	Yes	CY		
08/17/2001	01/01/2002	12/31/2002	0.15	M3	91	KG	StewartN	Yes	CY		
08/17/2001	01/01/2003	12/31/2003	0	M3	0	KG	StewartN	Yes	CY		
08/17/2001	01/01/2004	12/31/2004	0	M3	0	KG	StewartN	Yes	CY		
08/17/2001	01/01/2005	12/31/2005	0	M3	0	KG	StewartN	Yes	CY		
08/17/2001	01/01/2006	12/31/2006	0	M3	0	KG	StewartN	Yes	CY		

Integrated Waste Tracking System Material Profile

Information Only

Generation Inactive Estimates ANL182CH

Estimate Date	Start Date	End Date	Vol Qty	Vol Units	Mass Qty	Mass Units	Data Entered By	Active	Est Type	Inactivated By	Inactivated Date
02/16/1998	01/01/1998	12/31/1998	1.25	M3	4	KG	ThiesenTJ	No	CY	grantr	07/07/1999
05/24/1999	01/01/1999	12/31/1999	0.344	M3	700	LBS	StewartNA	No	CY	grantr	07/07/1999
07/07/1999	01/01/2000	12/31/2000	0.21	M3	182	KG	grantr	No	CY	grantr	10/15/2001
07/07/1999	01/01/2001	12/31/2001	0.21	M3	182	KG	grantr	No	CY	grantr	10/15/2001
05/24/1999	01/01/2000	12/31/2000	0.344	M3	700	LBS	IWTS	No	CY		
05/24/1999	01/01/2001	12/31/2001	0.344	M3	700	LBS	IWTS	No	CY		
05/24/1999	01/01/2002	12/31/2002	0.344	M3	700	LBS	IWTS	No	CY		
05/24/1999	01/01/2003	12/31/2003	0.344	M3	700	LBS	IWTS	No	CY		

Layers ANL182CH

Layer or Phase	Physical State at 70 F	Range of Percentage From	To	Units	Color
1	liquid	100	100	wt%	gray/silver

Physical Characteristics ANL182CH

1. **Density of material or waste (may not be required for hazardous waste and recyclable material):**

   Liquid: 0.847 **To:** **g/ml** **Solid:** **To:**

2. No **Is this aqueous waste? If yes, give total solids range:**

   From: **To:** **g/ml**

3. No **Is this incinerable liquid? If yes, give viscosity range:**

   From: **To:** **SSU**

Physical Composition ANL182CH

Char. No.	Related Characteristic (Use *Other* Where NA)	Name of Material	Carcinogen	Composition Range From/To/Units		
0	*Other*	Alloy Steels	No	25	50	wt%
0	*Other*	Mild Steel	No	25	50	wt%
7	Air reactives	Sodium Potassium Alloy (NaK)	No	25	50	wt%
8	Water reactives	Sodium Potassium Alloy (NaK)	No	25	50	wt%

Integrated Waste Tracking System Material Profile

Information Only

Flash Point, Incinerable Properties, and RCRA ANL182CH

1. No **Is flash point applicable? If yes, complete the following:**

   Flash Point: **To:** **Method used:**

   (Specify Other):

2. **Information for incinerable waste only:**

   a. **Heat of combustion:** **To:** **BTU/lb**

   b. **Ash content:** **To:** **wt%**

   c. **Total halogen content:** **To:** **ppm**

   d. **Water content:** **To:** **wt%**

   e. **Suspended particulates content:** **To:** **ppm**

3. No **Was a RCRA Waste analysis performed? If yes, enter data using "EPA Codes" screen.**

4. **Were the sampling and analysis protocols used in full compliance with SW-846 protocol or other equivalent regulatory agency approved methods?**

EPA Codes ANL182CH

Hazardous Constituents

			Expected Range			Representative Sample			Detection Limit	
EPA Code ID	TCLP Value	Type of Analysis	From	To	Units	From	To	Units	Limit	Units
D001G	No	Process Knowledge								
Ignitable Ignitable characteristic wastes, that are managed in non-CWA/non-CWA-equivalent/non-Class I SDWA systems.										
D003F	No	Process Knowledge								
Reactive Water reactives based on 261.23(a)(2),(3), and (4)										
D007A	Yes	Both	0	543	ppm	0	543	ppm		
Chromium Chromium (Total)										

Underlying Hazardous Constituents ANL182CH

	TCLP	Type of	Expected Range			Representative Sample			Detection Limit	
CAS	Value	Analysis	From	To	Units	From	To	Units	Limit	Units
7440-02-0	No	Approved Methods	0	338	ppm	0	199	ppm		
Nickel										

Chemical Composition ANL182CH No Data Available

Integrated Waste Tracking System Material Profile

Information Only

Radiological Characteristics ANL182CH

1. Y **Is fissile material present?** **Is fissile material >=.04 g/kg, waste matrix group is:**
2. **Total transuranic activity per gram of waste is:**
   - Y **<= 10 nCi/g (LLW)**
   - **> 10 nCi/g and <= 100 nCi/g (alpha LLW)**
   - **> 100 nCi/g (TRU)**
3. **Expected radiation dose rate:**

at contact of waste package(s)	0.1	**to**	500	**mrem/hr**
at 30 cm from waste package(s)		**to**		**mrem/hr**
at 1-meter from waste package(s)	0.1	**to**	100	**mrem/hr**

4. N **Is the waste greater than Class C as defined in 10 CFR 61.55?**

Isotopes - TRU U233, U-235 ANL182CH

Isotope	Activity Range or Sample Data					Fissionable Material Range or Sample Data			
	From	To	Sample	Units		From	To	Sample	Units
Pu-239				nCi/g					g/ft3
U-235				nCi/g					g/ft3

Integrated Waste Tracking System Material Profile

Information Only

Isotopes - Other ANL182CH

Isotope	Activity Range or Sample Data From	To	Sample	Units
Ag-110m				nCi/g
Au-198				nCi/g
Ba-140				nCi/g
Co-58				nCi/g
Co-60				nCi/g
Cr-51				nCi/g
Cs-134				nCi/g
Cs-137				nCi/g
Fe-59				nCi/g
H-3				nCi/g
I-131				nCi/g
In-113m				nCi/g
La-140				nCi/g
Mn-54				nCi/g
Na-22				nCi/g
Nb-95				nCi/g
Po-210				nCi/g
Sb-124				nCi/g
Sb-125				nCi/g
Sn-113				nCi/g
Sn-117m				nCi/g
Sr-89				nCi/g
Sr-90				nCi/g
Te-132				nCi/g

Integrated Waste Tracking System Material Profile

Information Only

Containers ANL182CH

Container Barcode	Container Date	Size	Container Units	Type	Common Name of Materials	Decommissioned
16931K	11/06/1997	0	M3	DM	SODIUM POTASSIUM - NaK containing or contaminated components from EBR-II	No
16934K	11/06/1997	8	GAL	CM	SODIUM POTASSIUM - NaK-Cold finger	No
16960K	11/17/1997	1	M3	CM	SODIUM POTASSIUM - NaK	Yes
23376P	05/26/1999	55	GAL	DM	Primary sodium system Na/NaK Heat Exchanger	No
23377P	05/26/1999	0	M3	DM	Secondary Sodium Storage Tank Level Probe with sodium contamination and NaK tubing	Yes
ANL010041	01/24/2001	1	GAL	CM	NaK Cleanup from 789 Crucible Melter Project	No
ANL010042	01/24/2001	1	GAL	CM	NaK Cleanup from 789 Crucible Melter Project	No
ANL010043	01/24/2001	1	GAL	CM	NaK Cleanup from 789 Crucible Melter Project	No
ANL010044	01/24/2001	1	GAL	CM	NaK Cleanup from 789 Crucible Melter Project	No
ANL010094	04/03/2001	120	GAL	CM	EBR-II Primary Purification System NaK	No
ANL010095	04/03/2001	120	GAL	CM	EBR-II Primary Purification System NaK	No
ANL010212	05/24/2001	30	GAL	CM	30-gal MSA Container w/ NaK	No
ANL010213	05/24/2001	55	GAL	DM	Debris or Equipment Contaminated with Sodium-Potassium (NaK) Alloy	No
ANL010214	05/24/2001	1	L	CM	Debris or Equipment Contaminated with Sodium-Potassium (NaK) Alloy	No
ANL010215	05/24/2001	5	GAL	CM	Debris or Equipment Contaminated with Sodium-Potassium (NaK) Alloy - NaK Covered w/ Sand	No
ANL010216	05/24/2001	3	GAL	CM	Debris or Equipment Contaminated with Sodium-Potassium (NaK) Alloy - NaK/Sand Nak Oxidized	No
ANL010223	06/26/2001	1	GAL	CM	NaK Tubing from Treatment of Secondary Na Level Probe	No
ANL010225	07/16/2001	1	GAL	CM	NaK Fitting	No
ANL010226	07/16/2001	5	GAL	CM	2-gal can of NaK packed in soda ash inside a 5-gal can	No
ANL010227	07/16/2001	10	GAL	CM	2-gal can of NaK packed in soda ash inside a 10-gal can	No
ANL010228	07/16/2001	5	GAL	CM	1-gal can of Nak packed in soda ash inside a 5-gal can	No
ANL010236	07/30/2001	3	GAL	CM	1-gal can with Sodium-Potassium (NaK) Alloy/Soda Ash	No
ANL1498	11/22/1974	4	FT3	CM	NaK Bubble Pot	No
ANL1499	11/22/1974	4	FT3	CM	NaK Bubble Pot	No
ANL1500	01/08/1990	0	FT3	CM	Sodium Potassium Alloy (NaK)	Yes
ANL990124	12/16/1999	113	GAL	CW	NaK Filled Pressure Transmitters	Yes
MFC090161	07/23/2009	0	M3	DM	Debris or Equipment Contaminated with Sodium-Potassium (NaK) Alloy	No

Comments ANL182CH No Data Available

Integrated Waste Tracking System Material Profile

Information Only

Screen	Column	Trans. Type	Before Change	After Change	Reason for Change	Inserted By	Insert Date
Process	Generating Process Description	Update	This waste stream was generated at ANL-767, EBR-II Reactor Building during routine maintenance activities on control systems. Specifically, spent cold traps and bubble pots had auxilliary cooling systems that circulated NaK as a heat exchange (cooling) medium. The traps and pots were designed to remove impurities in the argon cover gas system of the EBR-II. During Plant Closure Project activities NaK containing waste is being generated and entered into the container IWTS. D001 waste number is included in the event that one item has sodium contaminatio n with NaK in a separate tube/containe r. Chromium has been detected in containers holding Nak, so a D007 waste code has been added.	Sodium-Potassium liquid from reactor maintenance; heavy metal, ignitable and reactive hazards. This waste stream was generated at ANL-767, EBR-II Reactor Building during routine maintenance activities on control systems. Specifically, spent cold traps and bubble pots had auxilliary cooling systems that circulated NaK as a heat exchange (cooling) medium. The traps and pots were designed to remove impurities in the argon cover gas system of the EBR-II. During Plant Closure Project activities NaK containing waste is being generated and entered into the container IWTS. D001 waste number is included in the event that one item has sodium contaminatio n with NaK in a separate tube/containe r. Chromium has been detected in containers holding Nak, so a D007 waste code has been added.	Update the Generating Process Description first line to meet the Biennial Hazardous Waste Report requirements.	TygerG	11/02/2001

Integrated Waste Tracking System Material Profile

Information Only

Screen	Column	Trans. Type	Before Change	After Change	Reason for Change	Inserted By	Insert Date
Process	Generating Process Description	Update	Sodium-Potassium liquid from reactor maintenance; heavy metal, ignitable and reactive hazards. This waste stream was generated at ANL-767, EBR-II Reactor Building during routine maintenance activities on control systems. Specifically, spent cold traps and bubble pots had auxilliary cooling systems that circulated NaK as a heat exchange (cooling) medium. The traps and pots were designed to remove impurities in the argon cover gas system of the EBR-II. During Plant Closure Project activities NaK containing waste is being generated and entered into the container IWTS. D001 waste number is included in the event that one item has sodium contaminatio n with NaK in a separate tube/containe r. Chromium has been detected in containers holding Nak, so a D007 waste code has been added.	Liquid waste from reactor maintenance; heavy metal, ignitable and reactive hazards. This waste stream was generated at ANL-767, EBR-II Reactor Building during routine maintenance activities on control systems. Specifically, spent cold traps and bubble pots had auxilliary cooling systems that circulated NaK as a heat exchange (cooling) medium. The traps and pots were designed to remove impurities in the argon cover gas system of the EBR-II. During Plant Closure Project activities NaK containing waste is being generated and entered into the container IWTS. D001 waste number is included in the event that one item has sodium contaminatio n with NaK in a separate tube/containe r. Chromium has been detected in containers holding Nak, so a D007 waste code has been added.	Provide more generic descripiton of the waste	TygerG	12/11/2001

Integrated Waste Tracking System Material Profile

Information Only

Quality Record ANL182CH

Screen	Column	Trans. Type	Before Change	After Change	Reason for Change	Inserted By	Insert Date
Char. Req.	Source Code	Update	G15	G13	Change source code to reflect liquid.	TygerG	12/12/2001
Char. Req.	Form Code	Update	W307	W119	NaK is liquid not a solid.	StewartN	12/12/2001
Define	Record Status	Update	1	2	Inactivate per Jason Orme	WatersM	12/14/2006
Define	Record Status	Update	2	1	Unlocked to re-activate per request from Roy Grant. MFC personnel have been treating mixed waste assigned to the Sodium Components Maintenance Shop STP Backlog. During the container opening, sorting and treatment process, some waste is segregated	TallmanR	07/28/2009

Edit Log ANL182CH

Explanation and References

Name/Date/Time	Explanation
IWTS 12/13/2009 00:00:00	Material Profile inactivated on 2009-12-13 due to lack of yearly reapproval.
tallmanr 07/28/2009 11:49:53	Unlocked to re-activate per request from Roy Grant. MFC personnel have been treating mixed waste assigned to the Sodium Components Maintenance Shop STP Backlog. During the container opening, sorting and treatment process, some waste is segregated for future treatment as it does not fit into the current treatment methods or system. When this happens, the remaining waste is placed into containers with new IWTS barcodes and placed into the appropriate Material Profile. Recently, two container were partially treated and the remaining contents should be placed in Material Profiles that are inactive. I am requesting that IWTS Material Profiles ANL180RH and ANL182CH be reactivated so we can place the newly barcoded containers in those profiles. This will allow the STP treatment status queries to pick up the proper volume changes for the quarterly reports. Please call me at 6-9559 if you have questions. Roy
TallmanR 07/28/2009 11:49:41	TALLMANR. SITE_ADMIN. Call Point-4. Authorized on Generating Unit (ANL767).
watersm 12/14/2006 14:37:37	Inactivate per Jason Orme
WatersM 12/14/2006 14:37:30	WATERSM. SITE_ADMIN. Call Point-4. Authorized on Generating Unit (ANL767).
tygerg 12/12/2001 09:34:03	Change source code to reflect liquid
StewartN 12/12/2001 09:31:16	STEWARTN. ANL. Call Point-4. Authorized on Generating Unit (ANL767).
stewartn 12/12/2001 09:29:48	Correct source and form codes to represent NaK as a liquid.
TygerG 12/12/2001 09:21:07	TYGERG. WGS. Call Point-4. Authorized on Generating Unit (ANL767).
tygerg 12/11/2001 13:45:49	Revise description to be more generic
TygerG 12/11/2001 13:32:58	TYGERG. WGS. Call Point-4. Authorized on Generating Unit (ANL767).
tygerg 11/02/2001 10:16:00	Update the Generating Process Description first line to meet the Biennial Hazardous Waste Report requirements.
TygerG 11/02/2001 10:04:59	TYGERG. WGS. Call Point-4. Authorized on Generating Unit (ANL767).

Integrated Waste Tracking System Material Profile

Information Only

Edit Log ANL182CH

Explanation and References

Name/Date/Time	Explanation
GrantR 10/15/2001 16:24:34	BEGIN VALIDATION FOR MATERIAL PROFILE APPROVE GRANTR. ANL. Call Point-7. Authorized on Generating Unit (ANL767). RAD DATA VALIDATION PASSED HAZ DATA VALIDATION SOURCE CODE/FORM CODE PASSED EPA CODES PASSED SITE TREATMENT PLAN VALIDATION PASSED COMPOSITION VALIDATION PASSED OVERALL VALIDATION PASSED
grantr 10/15/2001 16:11:34	Adding D007 code and associated profile update information.
GrantR 10/15/2001 16:09:09	GRANTR. ANL. Call Point-4. Authorized on Generating Unit (ANL767).
StewartN 08/17/2001 10:45:22	BEGIN VALIDATION FOR MATERIAL PROFILE REVIEW STEWARTN. ANL. Call Point-6. Authorized on Generating Unit (ANL767). RAD DATA VALIDATION PASSED HAZ DATA VALIDATION SOURCE CODE/FORM CODE PASSED EPA CODES PASSED SITE TREATMENT PLAN VALIDATION PASSED COMPOSITION VALIDATION PASSED OVERALL VALIDATION PASSED
StewartN 08/17/2001 10:45:16	BEGIN VALIDATION FOR MATERIAL PROFILE CERTIFY STEWARTN. ANL. Call Point-5. Authorized on Generating Unit (ANL767). RAD DATA VALIDATION PASSED HAZ DATA VALIDATION SOURCE CODE/FORM CODE PASSED EPA CODES PASSED SITE TREATMENT PLAN VALIDATION PASSED COMPOSITION VALIDATION PASSED OVERALL VALIDATION PASSED

Edit Log ANL182CH

Explanation and References

Name/Date/Time	Explanation
StewartN 08/17/2001 10:43:32	BEGIN VALIDATION FOR MATERIAL PROFILE CERTIFY STEWARTN. ANL. Call Point-5. Authorized on Generating Unit (ANL767). RAD DATA VALIDATION PASSED HAZ DATA VALIDATION SOURCE CODE/FORM CODE PASSED EPA CODES PASSED SITE TREATMENT PLAN VALIDATION PASSED COMPOSITION VALIDATION COMPOSITION FAILED: The following Chemical Characteristics must be listed on the Composition screen: Water reactives OVERALL VALIDATION FAILED
stewartn 08/17/2001 10:35:13	update
StewartN 08/17/2001 10:34:41	STEWARTN. ANL. Call Point-4. Authorized on Generating Unit (ANL767).
WatsonR 07/05/2001 15:44:21	WATSONR. ANL. Call Point-4. Authorized on Generating Unit (ANL767).
watsonr 07/05/2001 15:43:21	Clear approval screen.
stewartn 04/19/2001 10:50:10	Update source and form codes for biennial report.
stewartn 04/19/2001 10:49:12	STEWARTN. ANL. Call Point-4. Authorized on Generating Unit (ANL767).
grantr 07/07/1999 13:29:23	5 yr forecast
grantr 07/07/1999 13:29:04	GRANTR. generator. Call Point-4. Authorized on Generating Unit (ANL767). Overall Authorization Passed.
StewartNA 05/24/1999 15:50:53	change physical state to liquid
StewartNA 05/24/1999 15:50:33	STEWARTNA. GI. Call Point-4. Authorized on Unit. Authorized on Action. Overall Authorization Passed.
StewartNA 05/11/1999 09:24:15	STEWARTNA. GI. Call Point-5. Authorized on Unit. Authorized on Action. Overall Authorization Passed.
StewartNA 05/11/1999 09:24:11	STEWARTNA. GI. Call Point-6. Authorized on Unit. Authorized on Action. Overall Authorization Passed.
StewartNA 05/11/1999 09:24:01	verification of data
StewartNA 05/11/1999 09:23:36	STEWARTNA. GI. Call Point-4. Authorized on Unit. Authorized on Action. Overall Authorization Passed.
StewartNA 02/17/1999 15:48:06	
StewartNA 02/17/1999 15:47:30	STEWARTNA. GI. Call Point-4. Authorized on Unit. Authorized on Action. Overall Authorization Passed.
GarciaJ 04/09/1998 06:53:37	GARCIAJ. SITE_ADMIN. Authorized.
GarciaJ 04/09/1998 06:53:20	GARCIAJ. SITE_ADMIN. Authorized.
ThiesenTJ 02/17/1998 11:52:01	THIESENTJ. GENERATOR. Call Point-2. Authorized on Unit. Authorized on Action.
ThiesenTJ 02/17/1998 11:51:59	THIESENTJ. GENERATOR. Call Point-3. Authorized on Unit. Authorized on Action.

Integrated Waste Tracking System Material Profile

Information Only

Material Profile Define 4807N.R2

Material Profile No.: 4807N.R2

Profile Date: 7/12/2011 8:33:17 AM

Name of Waste or Material: Site-Wide RCRA Characteristic Metal Debris

Site Treatment Plan ID: ID-INL-1YR MLLW RCRA waste in storage < 1yr

Generating Unit (e.g. Building or Process): MFC : MFC Generation area

Material or Waste Type and Action: Mixed Low Level Waste: Contact Handled

Record Status: Active

Record Lock Parameters: 07/12/2011 10:50:01 jacobsonj

Insert Parameters: 07/12/2011 08:33:17 JacobsonJ

Inactivation allows a record to remain selectable for historical profiles prior to the inactivation date. The inactivation data defaults to the date/time of inactivation, but can be changed to a user defined date/time. A canceled record will not be selectable by past, present, or future records. After a record is cancelled, a historical profile may continue to reference it, but any attempt to update the reference will require a new selection.

Integrated Waste Tracking System Material Profile

Information Only

Certification, Review & Approval 4807N.R2

Certified 	Name: Jonathan Jacobson Date: 07/12/2011 Phone: 2085337057 Fax: E-Mail: jonathan.jacobson@inl.gov	A waste determination process for this waste stream has been performed. Characterization data was derived by approved analytical methods or process knowledge information and any data limitations have been documented. Legally and scientifically defensible data was used for characterization whenever possible. The required data provided in this Material & Waste Characterization Profile is complete and accurate based on the analytical data or process knowledge information used for characterization.
Reviewed 	Name: Ann OHagan Date: 07/14/2011 Phone: 2085338060 Fax: E-Mail: Ann.Ohagan@inl.gov	An independent review of the Material and Waste Characterization Profile has shown that a waste determination was performed and that the required profile data is complete and accurate based on the analytical data or process knowledge information provided. All comments from this review have been addressed. The characterization data is sufficient to justify an approval or disapproval for the material or waste to be offered for disposition.
Approved 	Name: Charlyss D Lee Date: 07/14/2011 Phone: 2085337616 Fax: 2085337689 E-Mail: Charlyss.Lee@inl.gov	The Material and Waste Characterization Profile has been certified and independently reviewed. A regulatory based disposition path has been identified for the material defined by this profile. Approval to offer this material or waste for disposition is granted.

Last Profile Update and Approval 4807N.R2

Update/Approvals 	Name: Aaron Winder Date: 08/01/2013 Phone: 2085337973 Fax: E-Mail: Aaron.Winder@inl.gov	Waste defined by this Material and Waste Characterization Profile is currently being generated. An update and approval (as defined by the original approval statement) of this profile has been performed per the annual approval requirement established in the IWAC.

	First Name	Last Name	Phone	Fax	E-Mail	Mail Stop
Generator Contact:	INL	BEA	2085261361		Donald.Darrington@inl.gov	1310
Technical Contact:	Jonathan	Jacobson	2085337057		jonathan.jacobson@inl.gov	
Charge No:	1018563WG					

Material Profile Rejection Log 4807N.R2 No Data Available

Revision History 4807N.R2

Char_id	Profile Name	Profile Date	Record Status
4807N	Site-Wide RCRA Characteristic Metal Debris	11/07/2005	Inactive
4807N.R1	Site-Wide RCRA Characteristic Metal Debris	09/28/2009	Inactive
4807N.R2	Site-Wide RCRA Characteristic Metal Debris	07/12/2011	Active

Integrated Waste Tracking System Material Profile

Information Only

Material Profile Process 4807N.R2

1. Yes **Will material and waste characterization be fully capable of complying with applicable Waste Acceptance Criteria?**

   a. **Waste Acceptance Criteria requirements not met (list each):**

   b. **Receiving organization approval letter number for nonstandard material or waste:**

2. **Waste Generated from:** Routine Operations

   Cleanup/Stabilization Activity:

   Generating Status: On-going

   Is this secondary waste?

3. **Generating Process description (describe the process and/or operations generating material, be specific):**

   Site-Wide RCRA Characteristic Metal Debris, accumulated from routine facility maintenance (i.e. paint chips, brass fittings, elemental lead, circuit boards, light bulbs, asbestos, batteries, etc.).

   TSCA regulated site-wide characteristic metal debris may or may not apply on individual containers.

   Also to include site-wide routine accumulated/generated facility hot cell waste contaminated with RCRA metals from maintenance/cleanup/ refurbishment/ modifications/etc. [i.e. blotter paper/terri towels/etc., poly/plastic/herculite/etc., misc. ppe, misc. decon materials (mop heads/rags/etc), misc. metal scrap, filters, etc.].

4. **Physical state at 70 degrees F:** solid

5. No **Does material contain free liquids?**

6. Yes **Current waste minimization plan?** **Reference:** DOE/ID-10333

Special Characteristic 4807N.R2

Characteristic
Debris - RCRA
Nonfriable asbestos
PCB >= 50 ppm
Scrap Metal
Soil
Spill cleanup

Integrated Waste Tracking System Material Profile

Information Only

Characterization Requirements 4807N.R2

1. Yes **Is this DOT regulated hazardous material ?**

   If yes, identify DOT primary hazard: Class 7 **and DOT subsidiary hazard(s):**

2. Yes **At the point of generation did this material contain any RCRA "F", "K", "U", or "P" Listed waste either in pure form, as a mixture, or as a treatment residue (i.e., ash, leachate, spill cleanup), or "D" Characteristic waste?**

   Waste Description: Solid waste from operations, maintenance or cleanup

   Source Code: G13 Other Intermittent Events or Processes: Cleaning out process equipment

   Source Code Comments:

   Form Code: W002 Mixed Media/Debris/Devices: Contaminated debris: paper/clothing/rags/wood, empty containers, glass/piping/other solids

   Form Code Comments:

3. **RCRA hazardous waste determination was made by:** Both

4. No **Does this Material Profile contain Lab Packs?**

5. Yes **Was an Underlying Hazardous Constituent (UHC) determination performed?**

   No **If a UHC determination was performed, were any detected in concentrations exceeding the Universal Treatment Standards? List on UHC Screen.**

6. Yes **Is supporting documentation submitted? If yes, list:**

   WDDF, container specific ECARs included in WGS files.

7. No **Additional narrative:**

8. No **Is the material LDR Compliant?**

Generation Active Estimates 4807N.R2

Estimate Date	Start Date	End Date	Vol Qty	Vol Units	Mass Qty	Mass Units	Data Entered By	Active	Estimate Type	Inactivated By	Inactivated Date
08/01/2013	08/01/2013	12/31/2013	5000	FT3			WinderTA	Yes	CY		

Generation Inactive Estimates 4807N.R2 No Data Available

Layers 4807N.R2

Layer or Phase	Physical State at 70 F	Range of Percentage From	To	Units	Color
1	solid		100	wt%	misc

Integrated Waste Tracking System Material Profile

Information Only

Physical Characteristics 4807N.R2

1. **Density of material or waste (may not be required for hazardous waste and recyclable material):**

   Liquid: **To:** **g/ml** **Solid:** 0.5 **To:** 900 lbs/cf

2. No **Is this aqueous waste? If yes, give total solids range:**

   From: **To:** **g/ml**

3. No **Is this incinerable liquid? If yes, give viscosity range:**

   From: **To:** **SSU**

Physical Composition 4807N.R2

Char. No.	Related Characteristic (Use *Other* Where NA)	Name of Material	Carcinogen	Composition Range From/To/Units		
0	*Other*	Batteries: drained lead acid, nickel cadmium, lithium ion and other dry cell.	No	0	10	wt%
0	*Other*	Crushed and whole light bulbs: Mercury vapor, sodium vapor, HID, etc.	No	0	100	wt%
0	*Other*	Electrical components: balances, scanners, circuit boards, etc.	No	0	100	wt%
0	*Other*	Lead bricks, plugs, pigs, sheet, shot, scrap, blankets, etc.	No	0	100	wt%
0	*Other*	Metal structural debris and misc scrap metal pieces.	No	0	100	wt%
0	*Other*	Metal structural debris with circuit boards, brass valves/fittings, etc.	No	0	100	wt%
0	*Other*	Misc PPE (gloves, rubber boots, tyvek, etc), poly, paper, plastic, wood debris	No	0	100	wt%
0	*Other*	Misc PPE, poly, paper, plastic, paint chips, etc	No	0	49	wt%
0	*Other*	Misc. RCRA Scrap Metal: brass, brass w/copper, copper with solder, Wire, etc.	No	0	100	wt%
0	*Other*	Plastic structural debris with curcuit boards, brass valves/fittings, etc.	No	0	100	wt%
0	*Other*	Sediment material, sand, gravel, concrete, sludge, etc	No	0	49	wt%
3	Absorbents	Packaging material, vermiculite, kitty litter, desiccant, aquaset, etc.	No	0	90	wt%
19	Asbestos - Radioactively Contaminated	Components with non-friable asbestos	Yes	0	100	wt%
27	Filters, HEPA	HEPA Filters	No	0	100	wt%
28	Filters, Other	Pre filters, etc.	No	0	100	wt%
29	Glass	Glass windows w/ lead	No	1	100	wt%
66	PCBs >= 50 ppm	PCB Bulk Product - painted items	Yes	0	100	wt%

Integrated Waste Tracking System Material Profile

Information Only

Flash Point, Incinerable Properties, and RCRA 4807N.R2

1. No **Is flash point applicable? If yes, complete the following:**

   Flash Point: **To:** **Method used:**

   (Specify Other):

2. **Information for incinerable waste only:**

   a. **Heat of combustion:** **To:** **BTU/lb**

   b. **Ash content:** **To:** **wt%**

   c. **Total halogen content:** **To:** **ppm**

   d. **Water content:** **To:** **wt%**

   e. **Suspended particulates content:** **To:** **ppm**

3. Yes **Was a RCRA Waste analysis performed? If yes, enter data using "EPA Codes" screen.**

4. No **Were the sampling and analysis protocols used in full compliance with SW-846 protocol or other equivalent regulatory agency approved methods?**

EPA Codes 4807N.R2

Hazardous Constituents

			Expected Range			Representative Sample			Detection Limit	
EPA Code ID	**TCLP Value**	**Type of Analysis**	**From**	**To**	**Units**	**From**	**To**	**Units**	**Limit**	**Units**
D001G	No	Process Knowledge								
Ignitable Ignitable characteristic wastes, that are managed in non-CWA/non-CWA-equivalent/non-Class I SDWA systems.										
D003F	No	Process Knowledge								
Reactive Water reactives based on 261.23(a)(2),(3), and (4)										
D004A	No	Process Knowledge			mg/L			mg/L		mg/L
Arsenic										
D005A	No	Process Knowledge			mg/L			mg/L		mg/L
Barium										
D006A	No	Process Knowledge			mg/L			mg/L		mg/L
Cadmium										
D006D	No	Process Knowledge			mg/L			mg/L		mg/L
Cadmium Radioactively contaminated cadmium containing batteries										
D007A	No	Process Knowledge			mg/L			mg/L		mg/L
Chromium Chromium (Total)										
D008A	No	Process Knowledge			mg/L			mg/L		mg/L
Lead										
D008C	No	Process Knowledge			mg/L			mg/L		mg/L
Lead Radioactive lead solids										
D009A	No	Process Knowledge			mg/L					
Mercury Elemental mercury contaminated with radioactive materials										
D009D	No	Process Knowledge			mg/L			mg/L		mg/L
Mercury Low mercury <260 mg/kg total mercury										
D009G	No	Process Knowledge								
Mercury High-mercury inorganic subcategory (>=260 mg/kg total) inorganic, including incinerator and RMERC residues.										
D009I	No	Process Knowledge			mg/L			mg/L		mg/L
Mercury Radioactively contaminated mercury containing batteries										
D010A	No	Process Knowledge			mg/L			mg/L		mg/L
Selenium										

Integrated Waste Tracking System Material Profile

Information Only

EPA Codes 4807N.R2

Hazardous Constituents

EPA Code ID	TCLP Value	Type of Analysis	Expected Range From	To	Units	Representative Sample From	To	Units	Detection Limit Limit	Units
D011A	No	Process Knowledge			mg/L			mg/L		mg/L
Silver										
D011C	No	Process Knowledge			mg/L			mg/L		mg/L
Silver Radioactively contaminated silver containing batteries.										
F001A	No	Process Knowledge								
Spent halogenated solvents used in degreasing 1,1,1-Trichloroethane										
F001C	No	Process Knowledge								
Spent halogenated solvents used in degreasing Carbon tetrachloride										
F001F	No	Process Knowledge								
Spent halogenated solvents used in degreasing Trichloroethylene										
F002B	No	Process Knowledge								
Spent halogenated solvents 1,1,1-Trichloroethane										
F002H	No	Process Knowledge								
Spent halogenated solvents Tetrachloroethylene										
F002I	Yes	Process Knowledge								
Spent halogenated solvents Trichloroethylene										
F002K	No	Process Knowledge								
Spent halogenated solvents Carbon Tetrachloride										
F005C	No	Process Knowledge								
Spent non-halogenated solvents Benzene										
F005D	No	Process Knowledge								
Spent non-halogenated solvents Carbon disulfide										
F005G	No	Process Knowledge								
Spent non-halogenated solvents Pyridine										
F005H	No	Process Knowledge								
Spent non-halogenated solvents Toluene										
U134	No	Process Knowledge								
Hydrogen fluoride Fluoride (measured in wastewaters only)										

Underlying Hazardous Constituents 4807N.R2

CAS	TCLP Value	Type of Analysis	Expected Range From	To	Units	Representative Sample From	To	Units	Detection Limit Limit	Units
1336-36-3	No	Process Knowledge	50	500	ppm					
Polychlorinated biphenyls (PCBs)										
7440-36-0	No	Both								
Antimony										

Integrated Waste Tracking System Material Profile

Information Only

Chemical Composition 4807N.R2

CAS	Flam-mable	EPCRA	TSCA	TCLP Value	Type of Analysis	Expected Range From	Expected Range To	Expected Range Units	Representative Sample From	Representative Sample To	Representative Sample Units	Detection Limit Limit	Detection Limit Units
7440-50-8 Copper		Yes	No	No	Process Knowledge	0	1	wt%					
7439-89-6 Iron		No	No	No	Process Knowledge	0	2	wt%					
7439-92-1 Lead		Yes	No	No	Process Knowledge	0	5000	ppm					
7440-22-4 Silver		No	No	No	Process Knowledge	0	0.5	wt%					

Radiological Characteristics 4807N.R2

1. Y **Is fissile material present?** **Is fissile material >=.04 g/kg, waste matrix group is:**

2. Total transuranic activity per gram of waste is:

Y **<= 10 nCi/g (LLW)**

Y **> 10 nCi/g and <= 100 nCi/g (alpha LLW)**

N **> 100 nCi/g (TRU)**

3. Expected radiation dose rate:

at contact of waste package(s)	0.1	**to**	500	**mrem/hr**
at 30cm from waste package(s)		**to**		**mrem/hr**
at 1-meter from waste package(s)	0.1	**to**	50	**mrem/hr**

4. N **Is the waste greater than Class C as defined in 10 CFR 61.55?**

Isotopes - TRU U233, U-235 4807N.R2

Isotope	Activity Range or Sample Data From	To	Sample	Units	Fissionable Material Range or Sample Data From	To	Sample	Units
Am-241	6.600E-10	3.300E-03		Ci/m3				nCi/g
Am-242m	0.000E+00	3.952E-07		Ci/m3				nCi/g
Am-243	0.000E+00	3.952E-07		Ci/m3				nCi/g
Cm-243	5.000E-12	5.000E-07		Ci/m3				nCi/g
Cm-244	3.100E-11	5.200E-06		Ci/m3				nCi/g
Cm-248	5.000E-10	9.000E-02		Ci/m3				nCi/g
Np-237	2.000E-09	2.500E-02		Ci/m3				nCi/g
Pu-238	3.100E-10	7.020E-04		Ci/m3				nCi/g
Pu-239	2.100E-09	5.000E-02		Ci/m3				nCi/g
Pu-240	2.100E-09	2.500E-01		Ci/m3				nCi/g
Pu-241	7.600E-08	2.250E-02		Ci/m3				nCi/g
Pu-242	1.000E-10	1.000E-04		Ci/m3				nCi/g
U-233	5.000E-14	5.000E-02		Ci/m3				nCi/g
U-235	5.020E-16	5.020E-03		Ci/m3				nCi/g

Integrated Waste Tracking System Material Profile

Information Only

Isotopes - Other 4807N.R2

	Activity Range or Sample Data			
Isotope	From	To	Sample	Units
Ag-110m	2.730E-11	3.880E-07		Ci/m3
Ba-137m	1.720E-07	1.000E+02		Ci/m3
Ba-140	4.500E-11	6.400E-07		Ci/m3
Be-10	6.000E-11	4.000E-07		Ci/m3
Bi-210	0.000E+00	3.000E-05		Ci/m3
Bi-214	0.000E+00	5.000E-05		Ci/m3
C-14	5.000E-09	5.000E-04		Ci/m3
Ca-45	1.000E-19	4.000E-07		Ci/m3
Ce-141	4.430E-11	4.000E-03		Ci/m3
Ce-144	1.690E-07	1.990E-01		Ci/m3
Co-58	2.470E-09	7.210E-03		Ci/m3
Co-60	1.070E-07	3.620E-03		Ci/m3
Cr-51	1.500E-18	4.560E-07		Ci/m3
Cs-134	1.540E-08	2.000E-02		Ci/m3
Cs-135	2.750E-12	5.000E-03		Ci/m3
Cs-137	1.850E-07	2.500E+02		Ci/m3
Eu-152	1.310E-11	5.860E-06		Ci/m3
Eu-154	1.730E-09	1.000E-02		Ci/m3
Eu-155	1.470E-08	4.700E-03		Ci/m3
Fe-55	5.900E-06	8.390E-01		Ci/m3
Fe-59	1.270E-13	2.620E-06		Ci/m3
H-3	3.000E-10	4.500E-02		Ci/m3
I-129	3.000E-09	3.000E-04		Ci/m3
Kr-85	1.000E-12	5.000E-01		Ci/m3
La-140	3.920E-11	1.130E-04		Ci/m3
Mn-54	1.750E-06	4.550E-02		Ci/m3
Mo-93	3.850E-10	5.480E-06		Ci/m3
Na-22	9.820E-11	1.590E-04		Ci/m3
Nb-93m	6.290E-11	8.940E-07		Ci/m3
Nb-94	4.830E-09	3.210E-05		Ci/m3
Nb-95	7.240E-11	1.030E-03		Ci/m3
Nd-144	5.000E-11	5.000E-03		Ci/m3
Ni-59	1.550E-07	6.870E-04		Ci/m3
Ni-63	3.000E-15	7.440E-04		Ci/m3
Pa-234m	0.000E+00	4.500E-05		Ci/m3
Pb-210	0.000E+00	4.200E-05		Ci/m3

Pb-214	0.000E+00	4.200E-05	Ci/m3
Pm-147	5.000E-10	5.000E-02	Ci/m3
Po-210	0.000E+00	4.260E-03	Ci/m3
Po-214	0.000E+00	5.380E-05	Ci/m3
Po-218	0.000E+00	5.200E-05	Ci/m3
Pr-142	2.500E-12	2.500E-03	Ci/m3
Pr-144	1.690E-07	1.000E-01	Ci/m3
Pr-144m	2.040E-09	2.890E-05	Ci/m3
Ra-226	0.000E+00	2.300E-03	Ci/m3
Rh-106	1.180E-07	1.000E+00	Ci/m3
Rn-222	0.000E+00	5.380E-05	Ci/m3
Ru-103	0.000E+00	1.000E-01	Ci/m3
Ru-106	1.180E-07	1.000E+00	Ci/m3
Sb-124	0.000E+00	9.900E-02	nCi/g
Sb-125	1.380E-08	9.900E-02	Ci/m3
Sm-151	5.510E-09	7.810E-05	Ci/m3
Sn-119m	1.850E-11	2.640E-07	Ci/m3
Sn-123	4.840E-11	6.890E-07	Ci/m3
Sr-90	1.370E-07	1.000E+02	Ci/m3
Tc-99	6.320E-11	8.980E-05	Ci/m3
Te-125m	0.000E+00	2.400E-04	Ci/m3
Te-127m	3.490E-11	4.950E-07	Ci/m3
Th-228	0.000E+00	4.630E-05	Ci/m3
Th-230	0.000E+00	4.630E-05	Ci/m3
Th-231	0.000E+00	2.000E-06	Ci/m3
Th-232	0.000E+00	4.630E-05	Ci/m3
Th-234	0.000E+00	4.500E-06	Ci/m3
U-232	5.000E-15	5.000E-09	Ci/m3
U-234	3.000E-15	7.890E-02	Ci/m3
U-236	3.000E-15	4.000E-05	Ci/m3
U-237	0.000E+00	9.000E-06	Ci/m3
U-238	6.470E-11	1.290E-04	Ci/m3
V-49	4.190E-12	3.600E-07	Ci/m3
Y-90	1.300E-07	1.000E+02	Ci/m3
Zr-93	5.510E-12	7.810E-08	Ci/m3
Zr-95	3.260E-11	4.630E-05	Ci/m3

Integrated Waste Tracking System Material Profile

Information Only

Containers 4807N.R2

Container Barcode	Container Date	Size	Container Units	Type	Common Name of Materials	Decommissioned
13617-4	05/31/2011	111	FT3	CW	Site-Wide RCRA Characteristic Metal Debris	Yes
CS-02-10	02/06/2002	72	FT3	CW	Site-Wide RCRA Characteristic Metal Debris	Yes
CS-03-04	02/19/2003	18	FT3	CW	Site-Wide RCRA Characteristic Metal Debris	Yes
CS-03-05	02/26/2003	26	FT3	CW	Site-Wide RCRA Characteristic Metal Debris	Yes
CS-03-09	10/16/2003	23	FT3	CW	Site-Wide RCRA Characteristic Metal Debris	Yes
CS-81-62	10/22/1981	9	FT3	CW	Site-Wide RCRA Characteristic Metal Debris	Yes
CS-82-33	07/09/1982	7	FT3	CW	Site-Wide RCRA Characteristic Metal Debris	Yes
CS-83-28	06/21/1983	88	FT3	CW	Site-Wide RCRA Characteristic Metal Debris	Yes
CS-84-12	05/25/1984	72	FT3	CW	Site-Wide RCRA Characteristic Metal Debris	Yes
CS-84-14	05/25/1984	72	FT3	CW	Site-Wide RCRA Characteristic Metal Debris	Yes
CS-95-10	10/03/1995	15	FT3	CW	Site-Wide RCRA Characteristic Metal Debris	Yes
CS-97-09	09/18/1992	29	FT3	CW	Site-Wide RCRA Characteristic Metal Debris	Yes
MFC100095	04/16/2010	55	GAL	DM	Site-Wide RCRA Characteristic Metal Debris	No
MFC100269	10/21/2010	64	FT3	CM	Site-Wide RCRA Characteristic Metal Debris	Yes
MFC100303	12/01/2010	64	FT3	CM	Site-Wide RCRA Characteristic Metal Debris	Yes
MFC110085	04/07/2011	30	GAL	DM	Site-Wide RCRA Characteristic Metal Debris	Yes
MFC110100	04/28/2011	5	GAL	DM	Site-Wide RCRA Characteristic Metal Debris	Yes
MFC110109	07/18/2011	95	FT3	CM	Site-Wide RCRA Characteristic Metal Debris	Yes
MFC110125	06/10/2011	25	FT3	CW	Site-Wide RCRA Characteristic Metal Debris	Yes
MFC110126	06/10/2011	20	FT3	CW	Site-Wide RCRA Characteristic Metal Debris	Yes
MFC110162	07/14/2011	85	GAL	DM	Site-Wide RCRA Characteristic Metal Debris	Yes
MFC110181	07/28/2011	42	FT3	CW	Site-Wide RCRA Characteristic Metal Debris	Yes
MFC110182	07/26/2011	90	FT3	CM	Site-Wide RCRA Characteristic Metal Debris	Yes
MFC110272	11/01/2011	96	FT3	CM	Site-Wide RCRA Characteristic Metal Debris	Yes
MFC110290	12/14/2011	96	FT3	CM	Site-Wide RCRA Characteristic Metal Debris	Yes
MFC110299	12/19/2011	96	FT3	CM	Site-Wide RCRA Characteristic Metal Debris	Yes
MFC110311	12/20/2011	50	FT3	IP	Site-Wide RCRA Characteristic Metal Debris	Yes
MFC120005	01/09/2012	96	FT3	CM	Site-Wide RCRA Characteristic Metal Debris	Yes
MFC120009	02/01/2012	55	GAL	DM	Site-Wide RCRA Characteristic Metal Debris	Yes
MFC120044	02/29/2012	96	FT3	CM	Site-Wide RCRA Characteristic Metal Debris	Yes

Integrated Waste Tracking System Material Profile

Information Only

MFC120049	03/21/2012	96	FT3	CM	Site-Wide RCRA Characteristic Metal Debris	Yes
MFC120052	07/20/2012	20	GAL	DM	Site-Wide RCRA Characteristic Metal Debris	Yes
MFC120054	07/20/2012	96	FT3	CM	Site-Wide RCRA Characteristic Metal Debris	Yes
MFC120075	06/18/2012	96	FT3	CM	Site-Wide RCRA Characteristic Metal Debris	Yes
MFC120125	10/15/2012	22	FT3	DM	Site-Wide RCRA Characteristic Metal Debris	Yes
MFC130019	04/04/2013	55	GAL	DM	Site-Wide RCRA Characteristic Metal Debris	Yes
MFC130031	03/06/2013	1	FT3	BA	Site-Wide RCRA Characteristic Metal Debris	Yes
MFC130063	04/10/2013	55	GAL	IP	Site-Wide RCRA Characteristic Metal Debris	No
MFC130066	04/18/2013	55	GAL	DM	Site-Wide RCRA Characteristic Metal Debris	Yes
MFC130114	05/22/2013	96	FT3	CM	Site-Wide RCRA Characteristic Metal Debris	No
MFC130115	05/20/2013	1280	FT3	CM	Site-Wide RCRA Characteristic Metal Debris	Yes
MFC130121	06/06/2013	64	FT3	CM	Site-Wide RCRA Characteristic Metal Debris	No
MFC130128	06/12/2013	96	FT3	CM	Site-Wide RCRA Characteristic Metal Debris	No
MFC130135	07/16/2013	96	FT3	IP	Site-Wide RCRA Characteristic Metal Debris	No

Comments 4807N.R2 No Data Available

Integrated Waste Tracking System Material Profile

Information Only

Quality Record 4807N.R2

Screen	Column	Trans. Type	Before Change	After Change	Reason for Change	Inserted By	Insert Date
Isotopes-Other	Isotope	Insert		Pa-234m	Add Isotope	JacobsonJ	11/21/2011
Isotopes-Other	Isotope	Insert		Ra-226	Add Isotope	JacobsonJ	11/21/2011
Isotopes-Other	Isotope	Insert		Th-231	Add Isotope	JacobsonJ	11/21/2011
Isotopes-Other	Isotope	Insert		Te-125m	Add Isotope	JacobsonJ	11/21/2011
Isotopes-Other	Isotope	Insert		Th-234	Add Isotope	JacobsonJ	11/21/2011
Isotopes-Other	Isotope	Insert		Bi-210	add isotopes	JacobsonJ	12/07/2011
Isotopes-Other	Isotope	Insert		Bi-214	add isotopes	JacobsonJ	12/07/2011
Isotopes-Other	Isotope	Insert		Pb-210	add isotopes	JacobsonJ	12/07/2011
Isotopes-Other	Isotope	Insert		Pb-214	add isotopes	JacobsonJ	12/07/2011
Isotopes-Other	Isotope	Insert		Po-210	add isotopes	JacobsonJ	12/07/2011
Isotopes-Other	Isotope	Insert		Po-214	add isotopes	JacobsonJ	12/07/2011
Isotopes-Other	Isotope	Insert		Rn-222	add isotopes	JacobsonJ	12/07/2011
Isotopes-Other	Isotope	Insert		Po-218	add isotopes	JacobsonJ	12/07/2011
Analyte (7439-92-1)	Expected Range to	Update	25	5000	Update lead chemical comp	JacobsonJ	04/03/2012
Analyte (7439-92-1)	Expected Range units	Update	wt%	ppm	Update	JacobsonJ	04/03/2012
Composition	Name of Material	Insert		Metal structural debris and misc scrap metal pieces. : 0	Update physical comp	JacobsonJ	04/09/2012
Isotopes-Other (Te-125m)	Activity Range to	Update	2.4E-8	2.4e-4	Update activity range for Te-125m	JacobsonJ	04/12/2012
Define	Record Status	Update	2	1	update	LeeC	07/23/2012
Isotopes-Other (Nb-95)	Activity Range to	Update	0.000103	0.00103	increase range	JacobsonJ	05/20/2013
Isotopes-Other	Isotope	Insert		Kr-85	Add isotope Kr-85 per ECAR 2258.	AndersenT	05/23/2013
Isotopes-Other (Kr-85)	Activity Range to	Update	0.00407	0.5	update	LeeC	05/23/2013
Composition	Name of Material	Insert		Glass windows w/ lead: 29	add phys comp tab	JacobsonJ	05/29/2013
Composition	Name of Material	Insert		Misc. RCRA Scrap Metal: brass, brass w/copper, copper with solder, Wire, etc.: 0	added item to physical comp	WinderTA	08/01/2013
Approvals	Charge No.	Update	101623WGS	1018563WG	updated charge number	WinderTA	08/01/2013
Process	Reference	Update	INEEL P2 Plan DOE/ID-10333	DOE/ID-10333	Updated P2 plan	WinderTA	08/01/2013
Define	Record Status	Update	2	1	activate the material profile	WinderTA	08/01/2013

Integrated Waste Tracking System Material Profile

Information Only

Edit Log 4807N.R2

Explanation and References

Name/Date/Time	Explanation
winderta 08/05/2013 07:01:09	add to physical composition
WinderTA 08/05/2013 07:00:52	WINDERTA.WGS-BEA. Call Point-4. Authorized on Generating Unit (MFC).
winderta 08/01/2013 08:16:19	activate the material profile
WinderTA 08/01/2013 08:16:10	WINDERTA.WGS-BEA. Call Point-4. Authorized on Generating Unit (MFC).
WinderTA 08/01/2013 08:05:23	Material Profile: 4807N.R2 BEGIN VALIDATION FOR MATERIAL PROFILE ANNUAL REVIEW WINDERTA.WGS-BEA. Call Point-7. Authorized on Generating Unit (MFC). RAD DATA VALIDATION PASSED HAZ DATA VALIDATION EPA CODES PASSED SOURCE CODE/FORM CODE PASSED WASTE DESCRIPTION PASSED SITE TREATMENT PLAN VALIDATION PASSED COMPOSITION VALIDATION PASSED OVERALL VALIDATION PASSED
winderta 08/01/2013 07:54:23	add to physical comp
WinderTA 08/01/2013 07:54:07	WINDERTA.WGS-BEA. Call Point-4. Authorized on Generating Unit (MFC).
IWTS 07/21/2013 00:00:00	Material Profile inactivated on 2013-07-21 due to lack of yearly reapproval.
jacobsonj 05/29/2013 11:10:25	Update
JacobsonJ 05/29/2013 11:10:22	JACOBSONJ.WGS-BEA. Call Point-4. Authorized on Generating Unit (MFC).
Leec 05/23/2013 13:20:32	update Kr-85 range.
LeeC 05/23/2013 13:20:24	LEEC.WGS-BEA. Call Point-4. Authorized on Generating Unit (MFC).
andersent 05/23/2013 09:29:45	Add isotope Kr-85 per ECAR 2258.
AndersenT 05/23/2013 09:29:19	ANDERSENT.WGS-BEA. Call Point-4. Authorized on Generating Unit (MFC).
jacobsonj 05/20/2013 07:20:51	update
JacobsonJ 05/20/2013 07:20:46	JACOBSONJ.WGS-BEA. Call Point-4. Authorized on Generating Unit (MFC).
andersent 10/08/2012 14:45:34	Add F005 for MEK.
AndersenT 10/08/2012 14:45:15	ANDERSENT.WGS-BEA. Call Point-4. Authorized on Generating Unit (MFC).
Leec 07/23/2012 08:34:56	activate
LeeC 07/23/2012 08:34:51	LEEC.WGS-BEA. Call Point-4. Authorized on Generating Unit (MFC).

Integrated Waste Tracking System Material Profile

Information Only

Edit Log 4807N.R2

Explanation and References

Name/Date/Time	Explanation
LeeC 07/20/2012 15:05:24	Material Profile: 4807N.R2 BEGIN VALIDATION FOR MATERIAL PROFILE ANNUAL REVIEW LEEC. WGS-BEA. Call Point-7. Authorized on Generating Unit (MFC). RAD DATA VALIDATION PASSED HAZ DATA VALIDATION EPA CODES PASSED SOURCE CODE/FORM CODE PASSED WASTE DESCRIPTION PASSED SITE TREATMENT PLAN VALIDATION PASSED COMPOSITION VALIDATION PASSED OVERALL VALIDATION PASSED
IWTS 07/15/2012 00:00:00	Material Profile inactivated on 2012-07-15 due to lack of yearly reapproval.
jacobsonj 04/12/2012 13:17:20	Update
JacobsonJ 04/12/2012 13:17:15	JACOBSONJ. WGS-BEA. Call Point-4. Authorized on Generating Unit (MFC).
jacobsonj 04/09/2012 10:09:04	Update physical comp
JacobsonJ 04/09/2012 10:08:45	JACOBSONJ. WGS-BEA. Call Point-4. Authorized on Generating Unit (MFC).
jacobsonj 04/03/2012 09:35:14	Update
JacobsonJ 04/03/2012 09:35:05	JACOBSONJ. WGS-BEA. Call Point-4. Authorized on Generating Unit (MFC).
winderta 12/23/2011 07:59:52	add chromium
WinderTA 12/23/2011 07:59:45	WINDERTA. WGS-BEA. Call Point-4. Authorized on Generating Unit (MFC).
jacobsonj 12/07/2011 11:10:08	add isotopes
JacobsonJ 12/07/2011 11:09:58	JACOBSONJ. WGS-BEA. Call Point-4. Authorized on Generating Unit (MFC).
jacobsonj 11/21/2011 13:49:26	Add Isotope
JacobsonJ 11/21/2011 13:49:17	JACOBSONJ. WGS-BEA. Call Point-4. Authorized on Generating Unit (MFC).
LeeC 07/14/2011 09:58:56	Material Profile: 4807N.R2 BEGIN VALIDATION FOR MATERIAL PROFILE APPROVE LEEC. WGS-BEA. Call Point-7. Authorized on Generating Unit (MFC). RAD DATA VALIDATION PASSED HAZ DATA VALIDATION EPA CODES PASSED SOURCE CODE/FORM CODE PASSED WASTE DESCRIPTION PASSED SITE TREATMENT PLAN VALIDATION PASSED COMPOSITION VALIDATION PASSED OVERALL VALIDATION PASSED

Edit Log 4807N.R2

Explanation and References

Name/Date/Time	Explanation
OHaganA 07/14/2011 08:58:22	Material Profile: 4807N.R2 BEGIN VALIDATION FOR MATERIAL PROFILE REVIEW OHAGANA. WGS-BEA. Call Point-6. Authorized on Generating Unit (MFC). RAD DATA VALIDATION PASSED HAZ DATA VALIDATION EPA CODES PASSED SOURCE CODE/FORM CODE PASSED WASTE DESCRIPTION PASSED SITE TREATMENT PLAN VALIDATION PASSED COMPOSITION VALIDATION PASSED OVERALL VALIDATION PASSED
jacobsonj 07/12/2011 12:47:41	Update
JacobsonJ 07/12/2011 12:47:37	JACOBSONJ. WGS-BEA. Call Point-4. Authorized on Generating Unit (MFC).
JacobsonJ 07/12/2011 10:49:59	Material Profile: 4807N.R2 BEGIN VALIDATION FOR MATERIAL PROFILE CERTIFY JACOBSONJ. WGS-BEA. Call Point-5. Authorized on Generating Unit (MFC). RAD DATA VALIDATION PASSED HAZ DATA VALIDATION EPA CODES PASSED SOURCE CODE/FORM CODE PASSED WASTE DESCRIPTION PASSED SITE TREATMENT PLAN VALIDATION PASSED COMPOSITION VALIDATION PASSED OVERALL VALIDATION PASSED

Integrated Waste Tracking System Material Profile

Information Only

Material Profile Define 5399N

Material Profile No.: 5399N

Profile Date: 8/28/2007 4:33:52 PM

Name of Waste or Material: Transuranic samples from the AL

Site Treatment Plan ID: CH-ANL-553 WCA MIXED WASTE

Generating Unit (e.g. Building or Process): MFC-752 : MFC 752 Laboratory and Office Building

Material or Waste Type and Action: Mixed Transuranic: Contact Handled

Record Status: Active

Record Lock Parameters: 08/10/2010 11:27:30 jacobsonj

Insert Parameters: 08/28/2007 16:34:50 LeeC

Inactivation allows a record to remain selectable for historical profiles prior to the inactivation date. The inactivation data defaults to the date/time of inactivation, but can be changed to a user defined date/time. A canceled record will not be selectable by past, present, or future records. After a record is cancelled, a historical profile may continue to reference it, but any attempt to update the reference will require a new selection.

Integrated Waste Tracking System Material Profile

Information Only

Certification, Review & Approval 5399N

Certified 	Name: Jonathan Jacobson Date: 08/10/2010 Phone: 2085337057 Fax: E-Mail: jonathan.jacobson@inl.gov	A waste determination process for this waste stream has been performed. Characterization data was derived by approved analytical methods or process knowledge information and any data limitations have been documented. Legally and scientifically defensible data was used for characterization whenever possible. The required data provided in this Material & Waste Characterization Profile is complete and accurate based on the analytical data or process knowledge information used for characterization.
Reviewed	Name: Date: Phone: Fax: E-Mail:	
Approved	Name: Date: Phone: Fax: E-Mail:	

Last Profile Update and Approval 5399N

Update/Approvals	Name: Date: Phone: Fax: E-Mail:	

	First Name	Last Name	Phone	Fax	E-Mail	Mail Stop
Generator Contact:	Roy	Grant	2088812611		rpgrant@energysolutions.com	
Technical Contact:	Charlyss D	Lee	2085337616	2085337689	Charlyss.Lee@inl.gov	6164
Charge No:	101669DLW					

Material Profile Rejection Log 5399N No Data Available

Revision History 5399N

Char_id	Profile Name	Profile Date	Record Status
5399N	Transuranic samples from the AL	08/28/2007	Active

Integrated Waste Tracking System Material Profile

Information Only

Material Profile Process 5399N

1. Yes **Will material and waste characterization be fully capable of complying with applicable Waste Acceptance Criteria?**
   a. **Waste Acceptance Criteria requirements not met (list each):**
   b. **Receiving organization approval letter number for nonstandard material or waste:**
2. **Waste Generated from:** **Cleanup/Stabilization Activity:** **Generating Status:**

   Routine Operations On-going

   Is this secondary waste?
3. **Generating Process description (describe the process and/or operations generating material, be specific):**

   Mixed transuranic waste that carries both listed and characteristic codes.

   Solid sludge samples from Rocky Flats generated MTRU drums. The waste drums contained ID-300, IDC-700 and IDC-801 sludges.

4. **Physical state at 70 degrees F:** solid
5. No **Does material contain free liquids?**
6. Yes **Current waste minimization plan?** **Reference:** DOE/ID-10333

Special Characteristic 5399N

Characteristic

Debris - RCRA

Integrated Waste Tracking System Material Profile

Information Only

Characterization Requirements 5399N

1. Yes **Is this DOT regulated hazardous material ?**

   If yes, identify DOT primary hazard: Class7, Class 9 **and DOT subsidiary hazard(s):**

2. Yes **At the point of generation did this material contain any RCRA "F", "K", "U", or "P" Listed waste either in pure form, as a mixture, or as a treatment residue (i.e., ash, leachate, spill cleanup), or "D" Characteristic waste?**

   Waste Description: Solid laboratory analytical waste

   Source Code: G22 Pollution Control & Waste Mgmt Process Residuals: Laboratory analytical wastes (used chemicals)

   Source Code Comments:

   Form Code: W002 Mixed Media/Debris/Devices: Contaminated debris: paper/clothing/rags/wood, empty containers, glass/piping/other solids

   Form Code Comments: Sludge samples from verification of Rocky Flats transuranic waste.

3. **RCRA hazardous waste determination was made by:** Both

4. No **Does this Material Profile contain Lab Packs?**

5. Yes **Was an Underlying Hazardous Constituent (UHC) determination performed?**

   No **If a UHC determination was performed, were any detected in concentrations exceeding the Universal Treatment Standards? List on UHC Screen.**

6. Yes **Is supporting documentation submitted? If yes, list:**

   EDF-8310

7. No **Additional narrative:**

8. No **Is the material LDR Compliant?**

Generation Active Estimates 5399N

Estimate Date	Start Date	End Date	Vol Qty	Vol Units	Mass Qty	Mass Units	Data Entered By	Active	Estimate Type	Inactivated By	Inactivated Date
09/05/2007	09/05/2007	09/30/2007	5	GAL			LeeC	Yes	FY		

Generation Inactive Estimates 5399N No Data Available

Layers 5399N

Layer or Phase	Physical State at 70 F	Range of Percentage From	To	Units	Color
1	solid		100	vol%	

Integrated Waste Tracking System Material Profile

Information Only

Physical Characteristics 5399N

1. Density of material or waste (may not be required for hazardous waste and recyclable material):

   Liquid: To: g/ml Solid: 0.8 To: 1.5 g/cc

2. No Is this aqueous waste? If yes, give total solids range:

   From: To: g/ml

3. No Is this incinerable liquid? If yes, give viscosity range:

   From: To: SSU

Physical Composition 5399N

Char. No.	Related Characteristic (Use *Other* Where NA)	Name of Material	Carcinogen	Composition Range From/To/Units		
27	Filters, HEPA	HEPA Filters	No	0	100	vol%
34	Metal combinations or assemblies	Metal, drums	No	0	50	vol%
41	Sludge	Solid sludge from sampling of Rocky Flats generated drums.	No	0	100	vol%

Flash Point, Incinerable Properties, and RCRA 5399N

1. No Is flash point applicable? If yes, complete the following:

   Flash Point: To: Method used:

   (Specify Other):

2. Information for incinerable waste only:

   a. Heat of combustion: To: BTU/lb

   b. Ash content: To: wt%

   c. Total halogen content: To: ppm

   d. Water content: To: wt%

   e. Suspended particulates content: To: ppm

3. No Was a RCRA Waste analysis performed? If yes, enter data using "EPA Codes" screen.

4. No Were the sampling and analysis protocols used in full compliance with SW-846 protocol or other equivalent regulatory agency approved methods?

EPA Codes 5399N

Hazardous Constituents

			Expected Range			Representative Sample			Detection Limit	
EPA Code ID	TCLP Value	Type of Analysis	From	To	Units	From	To	Units	Limit	Units
D005A	No	Process Knowledge								
Barium										
D006A	No	Both								
Cadmium										
D007A	No	Both								
Chromium Chromium (Total)										
D008A	No	Both								
Lead										

Integrated Waste Tracking System Material Profile

Information Only

EPA Codes 5399N

Hazardous Constituents

EPA Code ID	TCLP Value	Type of Analysis	Expected Range From	Expected Range To	Expected Range Units	Representative Sample From	Representative Sample To	Representative Sample Units	Detection Limit	Detection Limit Units
D009D	No	Both								
Mercury Low mercury < 260 mg/kg total mercury										
D011A	No	Process Knowledge								
Silver										
D022A	No	Process Knowledge								
Chloroform Chloroform managed in non-CWA/non-CWA-equivalent/non-Class I SDWA systems.										
D028A	No	Both								
1,2-Dichloroethane 1,2-Dichloroethane managed in non-CWA/non-CWA-equivalent/non-Class I SDWA systems.										
D029A	No	Process Knowledge								
1,1-Dichloroethylene 1,1-Dichloroethylene managed in non-CWA/non-CWA-equivalent/non-Class I SDWA systems.										
D036A	No	Process Knowledge								
Nitrobenzene Nitrobenzene managed in non-CWA/non-CWA-equivalent/non-Class I SDWA systems.										
F001A	No	Process Knowledge								
Spent halogenated solvents used in degreasing 1,1,1-Trichloroethane										
F001B	No	Process Knowledge								
Spent halogenated solvents used in degreasing 1,1,2-Trichloro-1,2,2-trifluoroethane										
F001C	No	Process Knowledge								
Spent halogenated solvents used in degreasing Carbon tetrachloride										
F001D	No	Process Knowledge								
Spent halogenated solvents used in degreasing Methylene chloride										
F001E	No	Process Knowledge								
Spent halogenated solvents used in degreasing Tetrachloroethylene										
F001F	No	Process Knowledge								
Spent halogenated solvents used in degreasing Trichloroethylene										
F001G	No	Process Knowledge								
Spent halogenated solvents used in degreasing Trichloromonofluoromethane										
F002A	No	Process Knowledge								
Spent halogenated solvents o-Dichlorobenzene										
F002B	No	Process Knowledge								
Spent halogenated solvents 1,1,1-Trichloroethane										
F002C	No	Process Knowledge								
Spent halogenated solvents 1,1,2-Trichloro-1,2,2-trifluoroethane										
F002D	No	Process Knowledge								
Spent halogenated solvents 1,1,2-Trichloroethane										
F002E	No	Process Knowledge								
Spent halogenated solvents Chlorobenzene										
F002F	No	Process Knowledge								
Spent halogenated solvents Methylene chloride										
F002H	No	Process Knowledge								
Spent halogenated solvents Tetrachloroethylene										
F002I	No	Process Knowledge								
Spent halogenated solvents Trichloroethylene										
F002J	No	Process Knowledge								
Spent halogenated solvents Trichloromonofluoromethane										
F002K	No	Process Knowledge								
Spent halogenated solvents Carbon Tetrachloride										
F003A	No	Process Knowledge								
Spent non-halogenated solvents Acetone										
F003B	No	Process Knowledge								
Spent non-halogenated solvents Cyclohexanone										

Integrated Waste Tracking System Material Profile

Information Only

EPA Codes 5399N

Hazardous Constituents

EPA Code ID	TCLP Value	Type of Analysis	Expected Range From	Expected Range To	Expected Range Units	Representative Sample From	Representative Sample To	Representative Sample Units	Detection Limit Limit	Detection Limit Units
F003C	No	Process Knowledge								
Spent non-halogenated solvents Ethyl acetate										
F003D	No	Process Knowledge								
Spent non-halogenated solvents Ethyl benzene										
F003E	No	Process Knowledge								
Spent non-halogenated solvents Ethyl ether										
F003F	No	Process Knowledge								
Spent non-halogenated solvents Methanol										
F003G	No	Process Knowledge								
Spent non-halogenated solvents Methyl isobutyl ketone										
F003H	No	Process Knowledge								
Spent non-halogenated solvents n-Butyl alcohol										
F003I	No	Process Knowledge								
Spent non-halogenated solvents Xylenes - mixed isomers										
F005A	No	Process Knowledge								
Spent non-halogenated solvents 2-Ethoxyethanol										
F005B	No	Process Knowledge								
Spent non-halogenated solvents 2-Nitropropane										
F005C	No	Process Knowledge								
Spent non-halogenated solvents Benzene										
F005D	No	Process Knowledge								
Spent non-halogenated solvents Carbon disulfide										
F005E	No	Process Knowledge								
Spent non-halogenated solvents Isobutyl alcohol										
F005F	No	Process Knowledge								
Spent non-halogenated solvents Methyl ethyl ketone										
F005G	No	Process Knowledge								
Spent non-halogenated solvents Pyridine										
F005H	No	Process Knowledge								
Spent non-halogenated solvents Toluene										

Underlying Hazardous Constituents 5399N No Data Available

Chemical Composition 5399N No Data Available

Integrated Waste Tracking System Material Profile

Information Only

Radiological Characteristics 5399N

1. Y Is fissile material present? Is fissile material >=.04 g/kg, waste matrix group is:
2. Total transuranic activity per gram of waste is:
   - N <= 10 nCi/g (LLW)
   - N > 10 nCi/g and <= 100 nCi/g (alpha LLW)
   - Y > 100 nCi/g (TRU)
3. Expected radiation dose rate:
   - at contact of waste package(s) 0 to 10 mrem/hr
   - at 30 cm from waste package(s) to mrem/hr
   - at 1-meter from waste package(s) 0 to 1 mrem/hr
4. Y Is the waste greater than Class C as defined in 10 CFR 61.55?

Isotopes - TRU U233, U-235 5399N

Isotope	Activity Range or Sample Data					Fissionable Material Range or Sample Data			
	From	To	Sample	Units		From	To	Sample	Units
Am-241	0.000E+00	6.500E-05		Ci/g					nCi/g
Pu-238	0.000E+00	2.000E-05		Ci/g					nCi/g
Pu-239	0.000E+00	5.200E-05		Ci/g					nCi/g
Pu-240	0.000E+00	1.200E-05		Ci/g					nCi/g
Pu-241	0.000E+00	3.200E-05		Ci/g					nCi/g
Pu-242	0.000E+00	8.490E-10		Ci/g					nCi/g
U-235	0.000E+00	1.500E-10		Ci/g					nCi/g

Isotopes - Other 5399N No Data Available

Containers 5399N

Container Barcode	Container Date	Container Size	Container Units	Container Type	Common Name of Materials	Decommissioned
MFC070193	08/28/2007	5	GAL	DM	Transuranic samples from the AL	Yes
MFC090132	02/17/2010	55	GAL	DM	Transuranic samples from the AL	No
MFC100060	02/24/2010	55	GAL	DM	Transuranic samples from the AL	No

Comments 5399N No Data Available

Quality Record 5399N No Data Available

Edit Log 5399N

Explanation and References

Name/Date/Time	Explanation
allenm 09/13/2010 10:50:19	change isotope ranges
AllenM 09/13/2010 10:50:10	ALLENM. WGS-BEA. Call Point-4. Authorized on Generating Unit (ANL752).
allenm 09/13/2010 09:11:23	add to composition
AllenM 09/13/2010 09:11:18	ALLENM. WGS-BEA. Call Point-4. Authorized on Generating Unit (ANL752).
allenm 08/27/2010 10:27:42	add to composition
AllenM 08/27/2010 10:27:34	ALLENM. WGS-BEA. Call Point-4. Authorized on Generating Unit (ANL752).
JacobsonJ 08/10/2010 11:27:28	Material Profile: 5399N BEGIN VALIDATION FOR MATERIAL PROFILE CERTIFY JACOBSONJ. WGS-BEA. Call Point-5. Authorized on Generating Unit (ANL752). RAD DATA VALIDATION PASSED HAZ DATA VALIDATION EPA CODES PASSED SOURCE CODE/FORM CODE PASSED WASTE DESCRIPTION PASSED SITE TREATMENT PLAN VALIDATION PASSED COMPOSITION VALIDATION PASSED OVERALL VALIDATION PASSED
LeeC 09/05/2007 15:18:42	Material Profile: 5399N BEGIN VALIDATION FOR MATERIAL PROFILE CERTIFY LEEC. WGS. Call Point-5. Authorized on Generating Unit (ANL752). RAD DATA VALIDATION PASSED HAZ DATA VALIDATION WASTE DESCRIPTION PASSED SITE TREATMENT PLAN VALIDATION STP FAILED: Site Treatment Plan number required. COMPOSITION VALIDATION PASSED OVERALL VALIDATION FAILED

Attachment C-2

Examples of SDSs

Safety Data Sheet
Material Name: CADMIUM
SDS ID: OHS03720
Issue Date: 2011-12-20
Revision: 1.3600

Other Sections
02 03 04 05 06 07 08 09 10 11 11B 12 13 14 15 16

* * * Section 1 - PRODUCT AND COMPANY IDENTIFICATION* * *

Material Name: CADMIUM

ChemADVISOR, Inc.
Stone Quarry Crossing
811 Camp Horne Road, Suite 220
Pittsburgh, PA 15237
E-mail: info@chemadvisor.com

MSDS is for reference use only; please contact manufacturer for emergency response information, routine product inquiries and orders.

Chemical Family
metal

Synonyms
CADMIUM ELEMENT; CADMIUM BLUE; C.I. 77180; Cd

* * * Section 2 - HAZARDS IDENTIFICATION* * *

EMERGENCY OVERVIEW
Color: white
Physical Form: powder
Health Hazards: potentially fatal if inhaled, respiratory tract irritation, kidney damage, cancer hazard (in humans)
Physical Hazards: Negligible fire and explosion hazard in bulk form. Dust/air mixtures may ignite or explode.

POTENTIAL HEALTH EFFECTS

Inhalation
Short Term: potentially fatal if inhaled, irritation, cough, metallic taste, chills, fever, nausea, vomiting, chest pain, difficulty breathing, headache, dizziness, bluish skin color, lung congestion, lung damage, blood disorders, kidney damage, liver damage
Long Term: cough, tooth discoloration, weight loss, difficulty breathing, fatigue, mood swings, lung damage, blood disorders, bone disorders, kidney damage, liver damage, nerve damage, cancer

Skin Contact
Short Term: irritation
Long Term: irritation

Eye Contact
Short Term: irritation
Long Term: irritation

Ingestion
Short Term: nausea, vomiting, diarrhea, stomach pain, headache, dizziness, muscle cramps, blurred vision, kidney damage, liver damage
Long Term: kidney damage

* * * Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS* * *

CAS EC No Registration No	Component Synonyms	67/548 EEC (DSD)	1272/2008 (CLP)	Percent
7440-43-9 231-152-8 --	CADMIUM	T+ N; R:45-26-48/23/25-62-63-68-50/53 Note(s): E	Acute Inh. Tox. 2 Muta. 2 Carc. 1B Repr. 2_fd H361fd STOT RE 1 Aquatic Acute 1 Aquatic Chronic 1	100

Component Related Regulatory Information
This product may be regulated, have exposure limits or other information identified as the following: Cadmium compounds, Cadmium inorganic compounds.

* * * Section 4 - FIRST AID MEASURES* * *

Inhalation
If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

Skin
Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

Eyes
Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

Ingestion
If a large amount is swallowed, get medical attention.

Antidote
calcium disodium edetate/dextrose, intravenous; calcium disodium edetate/procaine, intramuscular.

* * * Section 5 - FIRE FIGHTING MEASURES* * *

See Section 9 for Flammability Properties

NFPA Ratings:
Health: 4 **Fire:** 3 **Reactivity:** 0
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Flammable Properties
Negligible fire and explosion hazard in bulk form. Finely divided material may ignite or explode.

Extinguishing Media
regular dry chemical, dry sand, lime, soda ash

Large fires: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn.

Fire Fighting Measures
Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Use extinguishing agents appropriate for surrounding fire. Avoid inhalation of material or combustion by-products.

* * * Section 6 - ACCIDENTAL RELEASE MEASURES* * *

Water Release
Subject to California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). Keep out of water supplies and sewers.

Occupational spill/release
Avoid heat, flames, sparks and other sources of ignition. Do not touch spilled material. Do not get water directly on material. Do not get water inside container. **Small spills:** Collect spilled material in appropriate container for disposal. Move containers away from spill to a safe area. **Large spills:** Dike for later disposal. Cover with plastic sheet or tarp to minimize spreading and protect from contact with water. Only personnel trained for the hazards of this material should perform clean up and disposal. Keep unnecessary people away, isolate hazard area and deny entry. Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).

* * * Section 7 - HANDLING AND STORAGE* * *

Handling Procedures
Use methods to minimize dust.

Storage Procedures
Store and handle in accordance with all current regulations and standards. Keep separated from incompatible substances.

* * * Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION* * *

Component Exposure Limits
CADMIUM (7440-43-9)

ACGIH:	0.01 mg/m3 TWA; 0.002 mg/m3 TWA (respirable fraction)
	9 mg/m3 IDLH (dust)
OSHA (US):	5 µg/m3 TWA (Do not eat, drink or chew tobacco or gum or apply cosmetics in regulated areas. Carcinogen - dust can cause lung and kidney

	disease, See 29 CFR 1910.1027); 2.5 µg/m3 Action Level
	0.1 mg/m3 TWA (fume, applies to any operations or sectors for which the Cadmium standard is stayed or otherwise not in effect); 0.2 mg/m3 TWA (dust, applies to any operations or sectors for which the Cadmium standard is stayed or otherwise not in effect); 5 µg/m3 TWA
	0.3 mg/m3 Ceiling (applies to any operations or sectors for which the Cadmium standard is stayed or otherwise not in effect, fume); 0.6 mg/m3 Ceiling (applies to any operations or sectors for which the Cadmium standard is stayed or otherwise not in effect, dust)
Mexico:	0.01 mg/m3 TWA LMPE-PPT (total dust); 0.002 mg/m3 TWA LMPE-PPT (respirable dust)

Exposure Limits for Chemicals which may be generated during processing
This material has no components listed.

Ventilation
Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

PERSONAL PROTECTIVE EQUIPMENT
Eyes/Face
Wear splash resistant safety goggles. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Protective Clothing
Wear appropriate chemical resistant clothing.

Glove Recommendations
Wear appropriate chemical resistant gloves. OSHA REGULATED SUBSTANCES: U.S. OSHA 29 CFR 1910.1027.

Respiratory Protection
The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.
OSHA Standard:
Respirator selection should comply with 29 CFR 1910.134, 29 CFR 1910.1027, and the final rule published in the Federal Register on August 24, 2006.
NIOSH Recommendations:
At any detectable concentration -
Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.
Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.
Escape -
Any air-purifying, full-facepiece respirator equipped with an N100, R100, or P100 filter.
Any appropriate escape-type, self-contained breathing apparatus.

* * * Section 9 - PHYSICAL AND CHEMICAL PROPERTIES* * *

Physical State: Solid	**Appearance:** lustrous
Color: white	**Physical Form:** powder
Odor: Not Available	**Odor Threshold:** Not available

Melting Point: 321 °C	**Boiling Point:** 765 °C
Vapor Pressure: 1 mmHg 394 °C	**Vapor Density (air = 1):** Not applicable
Density: Not available	**Specific Gravity (water = 1):** 8.642
Water Solubility: insoluble	**Coeff. Water/Oil Dist:** Not available
Molecular Weight: 112.41	**Molecular Formula:** Cd

Solvent Solubility
Soluble: acids, ammonium nitrate solutions, hot sulfuric acid, hydrochloric acid

* * * Section 10 - STABILITY AND REACTIVITY* * *

Chemical Stability
Stable at normal temperatures and pressure.

Conditions to Avoid
Dangerous gases may accumulate in confined spaces. Keep out of water supplies and sewers.

Incompatible Materials
oxidizing materials, acids, metals

CADMIUM:
AMMONIUM NITRATE (FUSED): Violent or explosive reaction.
HYDRAZOIC ACID: May explode violently.
NITRYL FLUORIDE: Incandescent reaction when heated slightly.
OXIDIZERS (STRONG): Fire and explosion hazard.
SELENIUM: Exothermic reaction.
SULFUR: Fire and explosion hazard.
TELLURIUM: Incandescent reaction in hydrogen atmosphere.
ZINC: Intense exothermic reaction.

Hazardous Decomposition Products
oxides of cadmium

Thermal decomposition products: oxides of cadmium.

Possibility of Hazardous Reactions
Will not polymerize.

* * * Section 11 - TOXICOLOGICAL INFORMATION* * *

Component Analysis - LD50/LC50
The components of this material have been reviewed in various sources and the following selected endpoints are published:

CADMIUM (7440-43-9)
Oral LD50 Rat 2330 mg/kg; Inhalation LC50 Rabbit 8 mg/L 4 h

RTECS Acute Toxicity (selected)
The components of this material have been reviewed, and RTECS publishes the following endpoints:

CADMIUM (7440-43-9)

Inhalation:	25 mg/m3/30 minute(s) Inhalation Rat LC50
Oral:	2330 mg/kg Oral Rat LD50

Acute Toxicity Level
CADMIUM (7440-43-9)

Highly Toxic:	inhalation
Moderately Toxic:	ingestion

Component Carcinogenicity
CADMIUM (7440-43-9)

ACGIH:	A2 - Suspected Human Carcinogen
IARC:	Monograph 100C [in preparation]; Monograph 58 [1993]; Supplement 7 [1987] (Group 1 (carcinogenic to humans))
NTP:	Known Human Carcinogen
DFG:	Category 1 (causes cancer in man)
OSHA:	Present
	Carcinogen - dust can cause lung and kidney disease - See 29 CFR 1910.1027

RTECS Irritation
The components of this material have been reviewed and RTECS publishes no data as of the date on this document.

Local Effects
CADMIUM (7440-43-9)

Irritant:	inhalation

Target Organs
CADMIUM (7440-43-9)
kidneys

Exposure to cadmium has been associated with an increased risk of lung cancer.

Medical Conditions Aggravated by Exposure
kidney disorders,respiratory disorders

RTECS Tumorigenic
The components of this material have been reviewed, and RTECS publishes the following endpoints:

CADMIUM (7440-43-9)
45 mg/kg Intramuscular Rat TD (4 week); 63 mg/kg Intramuscular Rat TD; 70 mg/kg Intramuscular Rat TD; 40 mg/kg Intramuscular Rat TDLo (4 week); 3372 ug/kg Subcutaneous Rat TDLo; 1200 mg/kg Unreported Rat TDLo; 129 ug/m3 Inhalation Woman TCLo (20 year(s))

RTECS Mutagenic
The components of this material have been reviewed, and RTECS publishes the following endpoints:

CADMIUM (7440-43-9)

1 umol/L hamster; 10 umol/L human; 250 umol/L/1 hour human; 5 nmol/L/24 hour mouse; 6 umol/L mouse

RTECS Reproductive Effects
The components of this material have been reviewed, and RTECS publishes the following endpoints:

CADMIUM (7440-43-9)

2 mg/kg Parenteral Hamster TDLo (pregnant 8 day(s)); 1686 ug/kg Intraperitoneal Mouse TDLo (pregnant 7 day(s)); 1700 mg/kg Oral Mouse TDLo (pregnant 8-12 day(s)); 62 mg/kg Oral Mouse TDLo (pregnant 1 day (s), post 10 day(s), continuous); 448 mg/kg Oral Mouse TDLo (Multigeneration); 1124 ug/kg Intraperitoneal Rat TDLo (male 1 day(s)); 8 mg/kg Intravenous Rat TDLo (pregnant 8-15 day(s)); 1250 ug/kg Intravenous Rat TDLo (pregnant 9 day(s)); 1250 ug/kg Intravenous Rat TDLo (pregnant 14 day(s)); 220 mg/kg Oral Rat TDLo (pregnant 1-22 day (s)); 23 mg/kg Oral Rat TDLo (pregnant 1-22 day(s)); 155 mg/kg Oral Rat TDLo (male 13 week, prior to copulation 13 week, pregnant 3 week, continuous); 21500 ug/kg Oral Rat TDLo (Multigeneration); 250 ug/kg Subcutaneous Rat TDLo (pregnant 19 day(s))

Additional Data
Smoking may result in higher blood lead levels.

Deficiencies in iron, calcium, zinc, protein and vitamins C and D may enhance the toxic effects. Alterations of drug metabolizing activity have been induced in animals.

Inhalation - Acute Exposure
CADMIUM: The average concentration of fume responsible for fatalities is 40-50 mg/m3 for 1 hour or 9 mg/m3 for 5 hours. Early symptoms may include mild irritation of the upper respiratory tract, rhinitis, vertigo, a sensation of constriction of the throat, a metallic taste in the mouth and cough. A latent period from 1-10 hours may precede the onset of rapidly progressing dyspnea, cyanosis, substernal or precordial chest pain, and a flu-like syndrome with weakness, malaise, nausea, vomiting, headache, fever, chills, shivering, profuse sweating, and muscular pains in the back and limbs. Cough with foamy or bloody sputum and pulmonary rales mark the onset of acute pulmonary edema which usually develops within 24 hours and reaches a maximum by 3 days. If death from asphyxia does not occur, and exposure was mild, symptoms may resolve within a week. In more severe exposures, all symptoms including proliferative interstitial pneumonitis may persist from 3-10 days. Permanent pulmonary fibrosis and hypertrophy of bronchial vessels may occur. The fatality rate has been estimated to be between 15-20%. Acute renal necrosis and/or liver damage may develop following massive acute exposure. Sequelae from non-fatal exposure may include microcytic, hypochromic anemia, testicular atrophy, cardiovascular effects, emphysema, anemia and osteomalacia.

Inhalation - Chronic Exposure
CADMIUM: Cadmium is highly cumulative. Repeated or prolonged exposure may cause irreversible lung injury of the emphysematous type with cough and shortness of breath, abnormal lung function, airways obstruction and possibly pulmonary fibrosis. Ulceration of the nasal septum and yellow discoloration of the teeth may occur. Cadmium induced kidney damage is irreversible and may progress after exposure ceases. Proteinuria may be the first sign of damage and may be associated with glucosuria, aminoaciduria, impaired excretion, decreased concentrating capacity, increased excretion of calcium and phosphorus, and increased plasma creatinine. Calciuria may favor the development of kidney stones. Some cases of kidney failure have been reported. Osteomalacia, osteoporosis, and spontaneous fractures may occur and may be manifested as back pain, pain in the extremities, difficulty in walking, and pain on bone pressure. Other symptoms may include damage to the olfactory nerve and anosmia, hemolytic and iron-deficiency anemia, weight loss, and irritability. Some studies suggest a relationship between cadmium levels in air and human cardiovascular disease and hypertension, but causal association has not been proven. Long-term

sequelae may include renal tubular necrosis, cardiovascular effects, and liver damage. Occupational exposure to cadmium is implicated in a significant increase in the incidence of prostatic and respiratory cancers. One study also reports a significant increase in renal cancers in those with inferred occupational exposure to cadmium. There is also limited information suggesting that cadmium may interfere with sperm production in humans.

Skin Contact - Acute Exposure
CADMIUM: Direct contact may result in irritation.

Skin Contact - Chronic Exposure
CADMIUM: Repeated or prolonged exposure to irritants may cause dermatitis.

Eye Contact - Acute Exposure
CADMIUM: Direct contact may cause irritation, redness, pain and smarting, but no injury has been reported.

Eye Contact - Chronic Exposure
CADMIUM: Repeated or prolonged exposure to irritants may cause conjunctivitis.

Ingestion - Acute Exposure
CADMIUM: Cadmium is a powerful emetic which induces vomiting so that less is retained and absorbed. If sufficient amounts are absorbed systemic toxicity may occur. Symptoms, which may begin within 1-60 minutes after ingestion, are salivation, choking, severe nausea, persistent vomiting, diarrhea, tenesmus, abdominal pain, blurred vision, dizziness, vertigo, headache, muscular cramps and rarely, convulsions, exhaustion, collapse, shock and unconsciousness. If death occurs, it is usually within 24 hours from shock due to fluid loss, or, it may be delayed 7-14 days and result from acute renal failure or cardiopulmonary depression. If victim survives, delayed liver and/or kidney damage may occur. A dose exceeding 300 mg may be fatal.

Ingestion - Chronic Exposure
CADMIUM: Cadmium is highly cumulative. Prolonged low level exposure may cause irreversible renal tubular dysfunction as described in chronic inhalation. Animal experiments indicate antagonistic activity between cadmium and zinc such that abnormal zinc metabolism was found to contribute significantly to the toxic syndrome following prolonged ingestion of cadmium. Functional changes in the liver, pancreas and adrenal glands which alter glucose metabolism may occur. Although inconclusive, some studies suggest a relationship between prolonged exposure to cadmium and human cardiovascular disease and hypertension. A study which supports this theory was reported where female rats exhibited hypertension after chronically ingesting cadmium through their drinking water. Reproductive effects such as congenital abnormalities, increased mortality, and reduced rates of growth have been found in animals after prolonged ingestion of cadmium.

* * * Section 12 - ECOLOGICAL INFORMATION* * *

Component Analysis - Aquatic Toxicity
CADMIUM (7440-43-9)

Fish:	96 Hr LC50 Oncorhynchus mykiss: 0.003 mg/L [flow-through]; 96 Hr LC50 Oncorhynchus mykiss: 0.006 mg/L [static]; 96 Hr LC50 Cyprinus carpio: 0.002 mg/L; 96 Hr LC50 Cyprinus carpio: 4.26 mg/L [semi-static]; 96 Hr LC50 Cyprinus carpio: 0.24 mg/L [static]; 96 Hr LC50 Lepomis macrochirus: 21.1 mg/L [flow-through]; 96 Hr LC50 Oryzias latipes: 0.016 mg/L; 96 Hr LC50 Pimephales promelas: 0.0004-0.003 mg/L
Invertebrate:	48 Hr EC50 Daphnia magna: 0.0244 mg/L [Static]

* * * Section 13 - DISPOSAL CONSIDERATIONS* * *

Disposal Methods

Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001. Hazardous Waste Number(s): D006. Dispose of in accordance with U.S. EPA 40 CFR 262 for concentrations at or above the Regulatory level. Regulatory level- 1.0 mg/L.

Component Waste Numbers
CADMIUM (7440-43-9)
RCRA: 1.0 mg/L regulatory level

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* * * Section 14 - TRANSPORT INFORMATION* * *

US DOT Information
Shipping Name: Flammable solid, toxic, inorganic, n.o.s. (Contains: CADMIUM)
Hazard Class: 4.1
UN/NA #: UN3179
Packing Group: II
Required Label(s): 4.1, 6.1

Component Marine Pollutants
This material contains one or more of the following chemicals required by US DOT to be identified as marine pollutants.

Component	CAS #	Minimum Concentration
CADMIUM	7440-43-9	DOT regulated severe marine pollutant (related to Cadmium compounds)

TDG Information
Shipping Name: Flammable solid, toxic, inorganic, n.o.s. (Contains: CADMIUM)
Hazard Class: 4.1
UN #: UN3179
Packing Group: II
Required Label(s): 4.1, (6.1)

Component Marine Pollutants (TDG)
This material contains one or more of the following chemicals required by CA TDG to be identified as marine pollutants.

CADMIUM (7440-43-9)
UN2570 (related to Cadmium compounds)

ADR Information
Shipping Name: Flammable solid, toxic, inorganic, n.o.s. (Contains: CADMIUM)
Hazard Class: 4.1
UN #: UN3179
Packing Group: II
Required Label(s): 4.1, 6.1

ADR Tunnel Code Restrictions
This list contains tunnel restriction codes for those substances and/or chemically related entries which are found in chapter 3.2 of the ADR regulations.

CADMIUM (7440-43-9)

Restriction (s):	C/E [UN2570] (I); D/E [UN2570] (II); E [UN2570] (III, related to Cadmium compounds)

RID Information
Shipping Name: Flammable solid, toxic, inorganic, n.o.s. (Contains: CADMIUM)
Hazard Class: 4.1
UN #: UN3179
Packing Group: II
Required Label(s): 4.1, 6.1

IATA Information
Shipping Name: Flammable solid, toxic, inorganic, n.o.s. (Contains: CADMIUM)
Hazard Class: 4.1
UN #: UN3179
Packing Group: II
Required Label(s): 4.1, 6.1

ICAO Information
Shipping Name: Flammable solid, toxic, inorganic, n.o.s. (Contains: CADMIUM)
Hazard Class: 4.1
UN #: UN3179
Packing Group: II
Required Label(s): 4.1, 6.1

IMDG Information
Shipping Name: Flammable solid, toxic, inorganic, n.o.s. (Contains: CADMIUM)
Hazard Class: 4.1
UN #: UN3179
Packing Group: II
Required Label(s): 6.1

* * * Section 15 - REGULATORY INFORMATION* * *

U.S. Federal Regulations
This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 311/312 (40 CFR 370.21), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), and/or require an OSHA process safety plan.

CADMIUM (7440-43-9)

SARA 313:	0.1 % de minimis concentration
CERCLA:	10 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm); 4.54 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm)

SARA Section 311/312 (40 CFR 370 Subparts B and C)
Acute Health: Yes **Chronic Health:** Yes **Fire:** Yes **Pressure:** No **Reactive:** No

U.S. State Regulations
The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA
CADMIUM	7440-43-9	Yes	Yes	Yes	Yes	Yes

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.
WARNING! This product contains a chemical known to the state of California to cause reproductive/developmental effects.

Component Analysis
CADMIUM (7440-43-9)

Carc: carcinogen, initial date 10/1/87

Repro/Dev. Tox: developmental toxicity, initial date 5/1/97

male reproductive toxicity, initial date 5/1/97

Canadian WHMIS Ingredient Disclosure List (IDL)
Components of this material have been checked against the Canadian WHMIS Ingredients Disclosure List. The List is composed of chemicals which must be identified on MSDSs if they are included in products which meet WHMIS criteria specified in the Controlled Products Regulations and are present above the threshold limits listed on the IDL.

CADMIUM (7440-43-9)
0.1 %

REACH List of Substances Subject to Restriction (Annex XVII) - Reg. (EU) No. 1907/2006
This list includes substances subject to Restriction. Under REACH, these substances are subject to restrictions on manufacture, placing on the market and use of certain dangerous substances, mixtures and articles.

CADMIUM (7440-43-9)
Use restricted. See item 23.; Use restricted. See item 28.

Symbol(s)
T+ Very Toxic
N Dangerous for the Environment

Risk Phrases
R26 Very toxic by inhalation.
R45 May cause cancer.
R48/23/25 Toxic: danger of serious damage to health by prolonged exposure through inhalation and if swallowed.
R50 Very toxic to aquatic organisms.
R53 May cause long-term adverse effects in the aquatic environment.
R62 Possible risk of impaired fertility.
R63 Possible risk of harm to the unborn child.
R68 Possible risk of irreversible effects.

Safety Phrases
S53 Avoid exposure - obtain special instructions before use.
S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S60 This material and its container must be disposed of as hazardous waste.
S61 Avoid release to the environment. Refer to special instructions/Safety data sheets.

Component Analysis - Inventory

Component	CAS	US	CA	EU	AU	PH	JP	KR	CN	NZ

CADMIUM	7440-43-9	Yes	DSL	EIN	Yes	Yes	No	Yes	Yes	Yes

Globally Harmonized System of Classification and Labelling (GHS)
The listed component(s) of this material have been checked for country-specific published classifications according to the Globally Harmonized System of Classification and Labelling (GHS). The results of the queries are displayed below. Please see the individual country listings, as additional interpretations or reference information may be available. For a reference list of H- or P-statements, please visit ChemADVISOR's website at www.chemadvisor.com\sdsoncommand\ghs_H&Pphrases.html.

Australia GHS Classifications
No published information available. This material may be hazardous according to published criteria for classification.

European Union GHS Classifications
Classifications below according to Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures (CLP).

CADMIUM (7440-43-9)

Acute toxicity - Inhalation - Category 2 **H330** Fatal if inhaled.

Germ cell mutagenicity - Category 2 **H341** Suspected of causing genetic defects.

Carcinogenicity - Category 1B **H350** May cause cancer.

Reproductive Toxicity - Category 2 **H361fd** Suspected of damaging fertility. Suspected of damaging the unborn child.

Specific target organ toxicity - Repeated exposure - Category 1 **H372** Causes damage to organs through prolonged or repeated exposure.

Hazardous to aquatic environment - acute hazard - Category 1 **H400** Very toxic to aquatic life.

Hazardous to aquatic environment - chronic hazard - Category 1 **H410** Very toxic to aquatic life with long lasting effects.

European Union GHS Labelling Information
Labelling information below is according to Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures (CLP).

CADMIUM (7440-43-9)

Symbol(s):

Signal Word: Danger

Hazard(s):

H330: Fatal if inhaled

H341: Suspected of causing genetic defects

H350: May cause cancer

H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child.

H372: Causes damage to organs through prolonged or repeated exposure

H410: Very toxic to aquatic life with long lasting effects

Prevention:

P271: Use only outdoors or in a well-ventilated area.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

P284: Wear respiratory protection.

P260: Do not breathe dust/fume/gas/mist/vapours/spray.

P264: Wash ... thoroughly after handling.

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P270: Do not eat, drink or smoke when using this product.

P273: Avoid release to the environment.

Response:

P308+P313: IF exposed or concerned: Get medical advice/attention.

P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P310: Immediately call a POISON CENTER or doctor/physician.

P320: Specific treatment is urgent (see ... on this label).

P391: Collect spillage.

Storage:

P403+P233: Store in a well-ventilated place. Keep container tightly closed.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ...

Indonesia GHS Classifications
No published information available. This material may be hazardous according to published criteria for classification.

Japan GHS Classifications
Classifications below published under Japan's Chemicals Classification Program according to the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

CADMIUM (7440-43-9)

Acute toxicity - Oral - Category 4 **H302** Harmful if swallowed.

Acute toxicity - Inhalation - Dust and Mist - Category 1 **H330** Fatal if inhaled.

Germ cell mutagenicity - Category 2 **H341** Suspected of causing genetic defects.

Carcinogenicity - Category 1A **H350** May cause cancer.

Toxic to reproduction - Category 2 **H361** Suspected of damaging fertility or the unborn child.

Specific target organ toxicity - Single exposure - Category 1 **H370** Causes damage to lung and/or respiratory system.

Specific target organ toxicity - Repeated exposure - Category 1 **H372** Causes damage to blood, bones, kidneys, lung, and/or respiratory system

through prolonged or repeated exposure.

Hazardous to aquatic environment - chronic hazard - Category 4 **H413** May cause long lasting harmful effects to aquatic life.

Japan GHS Labelling Information
Labelling information below according to classifications published by Japan's Chemicals Classification Program according to the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

CADMIUM (7440-43-9)

Symbol(s):

Signal Word: Danger

Hazard(s):

H302: Harmful if swallowed

H330: Fatal if inhaled

H341: Suspected of causing genetic defects

H350: May cause cancer

H361: Suspected of damaging fertility or the unborn child

H370: Causes damage to organs

H372: Causes damage to organs through prolonged or repeated exposure

H413: May cause long lasting harmful effects to aquatic life

Prevention:

P271: Use only outdoors or in a well-ventilated area.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

P284: Wear respiratory protection.

P260: Do not breathe dust/fume/gas/mist/vapours/spray.

P264: Wash ... thoroughly after handling.

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P270: Do not eat, drink or smoke when using this product.

P273: Avoid release to the environment.

Response:

P308+P313: IF exposed or concerned: Get medical advice/attention.

P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P310: Immediately call a POISON CENTER or doctor/physician.

P301+P312: IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.

P320: Specific treatment is urgent (see ... on this label).

P330: Rinse mouth.

Storage:

P403+P233: Store in a well-ventilated place. Keep container tightly closed.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ...

Korea GHS Classifications (SV)
Classifications below published by Korea's Ministry of Environment (MOE), Ministry of Employment and Labor (MOEL) or Office of National Emergency Management (NEMA, physical hazards only).

CADMIUM (7440-43-9)

MOE:

Acute toxicity - Inhalation - Category 1 **H330** Fatal if inhaled.

Germ cell mutagenicity - Category 2 **H341** Suspected of causing genetic defects.

Carcinogenicity - Category 1 **H350** May cause cancer.

Reproductive Toxicity - Category 2 **H361** Suspected of damaging fertility or the unborn child.

Specific target organ toxicity - Repeated exposure - Category 1 **H372** Causes damage to organs through prolonged or repeated exposure.

Hazardous to aquatic environment - acute hazard - Category 1 **H400** Very toxic to aquatic life.

Hazardous to aquatic environment - chronic hazard - Category 1 **H410** Very toxic to aquatic life with long lasting effects.

MOEL:

Acute toxicity - Oral - Category 4 **H302** Harmful if swallowed.

Acute toxicity - Inhalation - Dust and Mist - Category 1 **H330** Fatal if inhaled.

Germ cell mutagenicity - Category 2 **H341** Suspected of causing genetic defects.

Carcinogenicity - Category 1A **H350** May cause cancer.

Reproductive Toxicity - Category 2 **H361** Suspected of damaging fertility or the unborn child.

Specific target organ toxicity - Single exposure - Category 1 **H370** Causes damage to lung and/or respiratory system.

Specific target organ toxicity - Repeated exposure - Category 1 **H372** Causes damage to blood, bones, kidneys, lung, and/or respiratory system through prolonged or repeated exposure.

Hazardous to aquatic environment - chronic hazard - Category 4 **H413** May cause long lasting harmful effects to aquatic life.

Korea GHS Labelling Information
Labelling information below according to classifications published by Korea's Ministry of Environment (MOE), Ministry of Employment and Labor (MOEL) or Office of National Emergency Management (NEMA, physical hazards only).

CADMIUM (7440-43-9)

Symbol(s):

Signal Word: Danger

Hazard(s):

H330: Fatal if inhaled

H341: Suspected of causing genetic defects

H350: May cause cancer

H361: Suspected of damaging fertility or the unborn child

H372: Causes damage to organs through prolonged or repeated exposure

H410: Very toxic to aquatic life with long lasting effects

Prevention:

P271: Use only outdoors or in a well-ventilated area.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

P284: Wear respiratory protection.

P260: Do not breathe dust/fume/gas/mist/vapours/spray.

P264: Wash ... thoroughly after handling.

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P270: Do not eat, drink or smoke when using this product.

P273: Avoid release to the environment.

Response:

P308+P313: IF exposed or concerned: Get medical advice/attention.

P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P310: Immediately call a POISON CENTER or doctor/physician.

P320: Specific treatment is urgent (see ... on this label).

P391: Collect spillage.

Storage:

P403+P233: Store in a well-ventilated place. Keep container tightly closed.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ...

Symbol(s):

Signal Word: Danger

Hazard(s):

H302: Harmful if swallowed

H330: Fatal if inhaled

H341: Suspected of causing genetic defects

H350: May cause cancer

H361: Suspected of damaging fertility or the unborn child

H370: Causes damage to organs

H372: Causes damage to organs through prolonged or repeated exposure

H413: May cause long lasting harmful effects to aquatic life

Prevention:

P271: Use only outdoors or in a well-ventilated area.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

P284: Wear respiratory protection.

P260: Do not breathe dust/fume/gas/mist/vapours/spray.

P264: Wash ... thoroughly after handling.

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P270: Do not eat, drink or smoke when using this product.

P273: Avoid release to the environment.

Response:

P308+P313: IF exposed or concerned: Get medical advice/attention.

P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P310: Immediately call a POISON CENTER or doctor/physician.

P301+P312: IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.

P320: Specific treatment is urgent (see ... on this label).

P330: Rinse mouth.

Storage:

P403+P233: Store in a well-ventilated place. Keep container tightly closed.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ...

New Zealand GHS Classifications
Classifications below according to the Environmental Risk Management Authority's (ERMA) Hazardous Substances and New Organisms (HSNO) Act, as amended. For a reference list defining the alphanumeric categories, please visit ChemADVISOR's website at www.chemadvisor.com\sdsoncommand\ghs_NZ.html

CADMIUM (7440-43-9) Approval: HSR001530

Acute toxicity - Oral - Category 2 **H300** Fatal if swallowed.

Acute toxicity - Inhalation - Category 3 **H331** Toxic if inhaled.

Germ cell mutagenicity - Category 1 **H340** May cause genetic defects.

Carcinogenicity - Category 1 **H350** May cause cancer.

Reproductive Toxicity - Category 1 **H360** May damage fertility or the unborn child.

Specific target organ toxicity - Repeated exposure - Oral - Category 1 **H372** Causes damage to kidneys through prolonged or repeated exposure if swallowed.

Hazardous to aquatic environment - acute hazard - Category 1 **H400** Very toxic to aquatic life.

Soil Ecotoxicity - Category 3 **H423** Harmful to the soil environment.

Terrestrial Vertebrate Ecotoxicity - Category 2 **H432** Toxic to terrestrial vertebrates.

New Zealand GHS Labelling Information
Labelling information below according to classifications published by New Zealand's Environmental Risk Management Authority's (ERMA) Hazardous Substances and New Organisms (HSNO) Act, as amended. For a reference list defining the alphanumeric categories, please visit ChemADVISOR's website at www.chemadvisor.com\sdsoncommand\ghs_NZ.html

CADMIUM (7440-43-9)

Symbol(s):

Signal Word: Danger

Hazard(s):

H300: Fatal if swallowed

H331: Toxic if inhaled

H340: May cause genetic defects

H350: May cause cancer

H360: May damage fertility or the unborn child

H372: Causes damage to organs through prolonged or repeated exposure

H400: Very toxic to aquatic life

H423: Harmful to the soil environment

H432: Toxic to terrestrial vertebrates

Prevention:

P271: Use only outdoors or in a well-ventilated area.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

P260: Do not breathe dust/fume/gas/mist/vapours/spray.

P264: Wash ... thoroughly after handling.

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P270: Do not eat, drink or smoke when using this product.

P273: Avoid release to the environment.

Response:

P308+P313: IF exposed or concerned: Get medical advice/attention.

P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P311: Call a POISON CENTER or doctor/physician.

P301+P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.

P321: Specific treatment (see ... on this label).

P330: Rinse mouth.

P391: Collect spillage.

Storage:

P403+P233: Store in a well-ventilated place. Keep container tightly closed.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ...

South Africa GHS Classifications
No published information available. This material may be hazardous according to published criteria for classification.

Taiwan GHS Classifications
Information below presented according to Taiwan's Bureau of Standards, Metrology and Inspection (BSMI) of the Ministry of Economic Affairs. This agency has published a series of standards (CNS 15030 1-27 Chemical Classification and Labelling) which provide guidance on classification and labelling of chemicals according to GHS.

CADMIUM (7440-43-9)

Taiwan:

Acute toxicity - Oral - Category 5 **H303** May be harmful if swallowed.

Acute toxicity - Inhalation - Category 1 **H330** Fatal if inhaled.

Germ cell mutagenicity - Category 2 **H341** Suspected of causing genetic defects.

Carcinogenicity - Category 1 **H350** May cause cancer.

Reproductive Toxicity - Category 2 **H361** Suspected of damaging fertility or the unborn child.

Specific target organ toxicity - Repeated exposure - Category 1 **H372** Causes damage to organs through prolonged or repeated exposure.

Hazardous to aquatic environment - chronic hazard - Category 1 **H410** Very toxic to aquatic life with long lasting effects.

Taiwan GHS Labelling Information
Labelling information below according to classifications published by Taiwan's Bureau of Standards, Metrology and Inspection (BSMI) of the Ministry of Economic Affairs. This agency has published a series of standards (CNS 15030 1-27 Chemical Classification and Labelling) which provide guidance on classification and labelling of chemicals

according to GHS.

CADMIUM (7440-43-9)

Symbol(s):

Signal Word: Danger

Hazard(s):

H303: May be harmful if swallowed

H330: Fatal if inhaled

H341: Suspected of causing genetic defects

H350: May cause cancer

H361: Suspected of damaging fertility or the unborn child

H372: Causes damage to organs through prolonged or repeated exposure

H410: Very toxic to aquatic life with long lasting effects

Prevention:

P271: Use only outdoors or in a well-ventilated area.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

P284: Wear respiratory protection.

P260: Do not breathe dust/fume/gas/mist/vapours/spray.

P264: Wash ... thoroughly after handling.

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P270: Do not eat, drink or smoke when using this product.

P273: Avoid release to the environment.

Response:

P308+P313: IF exposed or concerned: Get medical advice/attention.

P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P310: Immediately call a POISON CENTER or doctor/physician.

P312: Call a POISON CENTER or doctor/physician if you feel unwell.

P320: Specific treatment is urgent (see ... on this label).

P391: Collect spillage.

Storage:

P403+P233: Store in a well-ventilated place. Keep container tightly closed.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ...

Classification
No classification assigned.

*** * * Section 16 - OTHER INFORMATION* * ***

Key / Legend
ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSL - Domestic Substances List; EEC - European Economic Communicty; EINECS - European Inventory of Existing Commercial Chemical Substances; EPA - Environmental Protection Agency; EU - European Union; F - Farenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IMDG - International Maritime Dangerous Goods; JP - Japan; Kow - Octanol/water partition coefficient; KR - Korea; LEL - Lower Explosive Limit; LOLI - List Of LIsts™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PH - Philippines; RCRA - Resource Conservation and Recovery Act; RID - European Rail Transport; RTECS - Registry of Toxic Effects of Chemical Substances®; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UEL - Upper Explosive Limit; US - United States

Full text of R phrases in Section 3
R26 Very toxic by inhalation.
R45 May cause cancer.
R48/23/25 Toxic: danger of serious damage to health by prolonged exposure through inhalation and if swallowed.
R50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R62 Possible risk of impaired fertility.
R63 Possible risk of harm to the unborn child.
R68 Possible risk of irreversible effects.

Other Information
Reasonable care has been taken in the preparation of this information; however, the manufacturer makes no warranty whatsoever including the warranty of merchantability, expressed or implied, with respect to this information. The manufacturer makes no representations and assumes no liability for any direct, incidental, consequential, or other such damages resulting from its use or misuse. **Disclaimer:** Supplier gives no warranty whatsoever, including the warranties of merchantability or of fitness for a particular purpose. Any product purchased is sold on the assumption the purchaser shall determine the quality and suitability of the product. Supplier expressly disclaims any and all liability for incidental, consequential or any other damages arising out of the use or misuse of this product. No information provided shall be deemed to be a recommendation to use any product in conflict with any existing patent rights. THIS MSDS IS TO BE UTILIZED SOLEY AS A REFERENCE DOCUMENT AND IT IS NOT TO BE USED TO SATISFY THE DISTRIBUTION REQUIREMENTS OF OSHA'S HAZARD COMMUNICATION STANDARD (HCS) NOR CANADA'S CONTROLLED PRODUCT REGULATION (CPR). Read the Material Safety Data Sheet before handling product. Use of any information contained herein is provided at the reader's own risk and thus independent judgment by trained professionals must be utilized at all times.

Copyright

Safety Data Sheet
Material Name: SODIUM METAL
SDS ID: OHS20850
Issue Date: 2011-09-16
Revision: 1.2400

Other Sections
02 03 04 05 06 07 08 09 10 11 11B 12 13 14 15 16

* * * Section 1 - PRODUCT AND COMPANY IDENTIFICATION* * *

Material Name: SODIUM METAL

ChemADVISOR, Inc.
Stone Quarry Crossing
811 Camp Horne Road, Suite 220
Pittsburgh, PA 15237
E-mail: info@chemadvisor.com

MSDS is for reference use only; please contact manufacturer for emergency response information, routine product inquiries and orders.

Chemical Family
metal

Synonyms
SODIUM; SODIUM-23; SODIUM ATOM; METALLIC SODIUM; ATOMIC SODIUM; UN 1428

* * * Section 2 - HAZARDS IDENTIFICATION* * *

EMERGENCY OVERVIEW
Color: gray
Physical Form: solid
Odor: odorless
Health Hazards: respiratory tract burns, skin burns, eye burns, mucous membrane burns
Physical Hazards: Extremely flammable. May ignite spontaneously on exposure to air. Reacts violently with water. May polymerize. Containers may rupture or explode.

POTENTIAL HEALTH EFFECTS

Inhalation
Short Term: cough, burns, difficulty breathing, dizziness, bluish skin color, lung congestion
Long Term: same as effects reported in short term exposure, digestive disorders

Skin Contact
Short Term: burns
Long Term: same as effects reported in short term exposure

Eye Contact

Short Term: burns, eye damage, blindness
Long Term: same as effects reported in short term exposure

Ingestion
Short Term: burns, vomiting, diarrhea, difficulty breathing, kidney damage
Long Term: same as effects reported in short term exposure

* * * Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS* * *

CAS EC No Registration No	Component Synonyms	67/548 EEC (DSD)	1272/2008 (CLP)	Percent
7440-23-5 231-132-9 --	SODIUM METAL	F C; R:14/15-34	Water-react. 1 Skin Corr. 1B	100.0

* * * Section 4 - FIRST AID MEASURES* * *

Inhalation
If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

Skin
Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get immediate medical attention. Thoroughly clean and dry contaminated clothing before reuse. Destroy contaminated shoes.

Eyes
Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

Ingestion
If swallowed, drink plenty of water, do NOT induce vomiting. Get immediate medical attention.

Note to Physicians
For inhalation, consider oxygen.
Avoid gastric lavage or emesis.

* * * Section 5 - FIRE FIGHTING MEASURES* * *

See Section 9 for Flammability Properties

NFPA Ratings:
Health: 3 **Fire:** 3 **Reactivity:** 2 **Other:** W
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe
Flammable Properties
Severe fire hazard. Vapor/air mixtures are explosive. May ignite on exposure to air.

Extinguishing Media
regular dry chemical, dry sand, lime, soda ash

Large fires: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn.

Fire Fighting Measures
Do not use water. Do not use foam. Move container from fire area if it can be done without risk. Use extinguishing agents appropriate for surrounding fire. Do not get water inside container. Avoid inhalation of material or combustion by-products.

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* * * Section 6 - ACCIDENTAL RELEASE MEASURES* * *

Soil Release
Dig holding area such as lagoon, pond or pit for containment.

Water Release
Cover with absorbent sheets, spill-control pads or pillows.

Occupational spill/release
Avoid heat, flames, sparks and other sources of ignition. Do not touch spilled material. Stop leak if possible without personal risk. Do not get water directly on material. Small dry spills: Collect material into suitable, loosely covered container for disposal. Move containers away from spill to a safe area. Small liquid spills: Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal. **Large spills:** Dike for later disposal. Powder spills: Cover with plastic sheet or tarp to minimize spreading and protect from contact with water. Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas. Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).

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* * * Section 7 - HANDLING AND STORAGE* * *

Handling Procedures
Use methods to minimize dust.

Storage Procedures
Store and handle in accordance with all current regulations and standards. Protect from physical damage. Keep out of water supplies and sewers. Store at room temperature. Store under an inert atmosphere. Store under an oxygen-free liquid (e.g., certain petroleum oils). Keep separated from incompatible substances. Store outside or in a detached building.

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* * * Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION* * *

Component Exposure Limits
ACGIH, NIOSH, EU, OSHA (US) and Mexico have not developed exposure limits for any of this product's components.

Exposure Limits for Chemicals which may be generated during processing
This material has no components listed.

Ventilation
Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

Eyes/Face
Wear splash resistant safety goggles with a faceshield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Protective Clothing
Wear appropriate chemical resistant clothing.

Glove Recommendations
Wear appropriate chemical resistant gloves.

Respiratory Protection
Under conditions of frequent use or heavy exposure, respiratory protection may be needed.
Respiratory protection is ranked in order from minimum to maximum.
Consider warning properties before use.
Any particulate respirator equipped with an N95, R95, or P95 filter (including N95, R95, and P95 filtering facepieces) except quarter-mask respirators. The following filters may also be used: N99, R99, P99, N100, R100 or P100.
Any air-purifying full-facepiece respirator equipped with an N95, R95, or P95 filter. The following filters may also be used: N99, R99, P99, N100, R100 or P100.
Any powered, air-purifying respirator with a high-efficiency particulate filter.
Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter.
Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode.
For Unknown Concentrations or Immediately Dangerous to Life or Health -
Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.
Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

* * * Section 9 - PHYSICAL AND CHEMICAL PROPERTIES* * *

Physical State: Solid	**Appearance:** Not available
Color: gray	**Physical Form:** solid
Odor: odorless	**Odor Threshold:** Not available
Melting Point: 97 - 98 °C	**Boiling Point:** 883 °C
Autoignition: >115 °C	**Vapor Pressure:** 1.2 mmHg 400 °C
Vapor Density (air = 1): Not applicable	**Density:** Not available
Specific Gravity (water = 1): 0.97	**Water Solubility:** reacts violently
Coeff. Water/Oil Dist: Not available	**Viscosity:** 0.680 cP 100 °C
Molecular Weight: 22.99	**Molecular Formula:** Na

Solvent Solubility
Insoluble: benzene, naphtha, kerosene, ether

* * * Section 10 - STABILITY AND REACTIVITY* * *

Chemical Stability
May ignite on exposure to air. Polymerizes with evolution of heat. Avoid contact with light. Reacts violently with water.

Conditions to Avoid
Avoid contact with air. Keep dry. Keep out of water supplies and sewers.

Incompatible Materials
acids, combustible materials, oxidizing materials, reducing agents, halo carbons, halogens, amines, metals, metal oxides, metal salts, bases

SODIUM METAL:
ACIDS: Explosive reaction, particularly with aqueous solutions.
ALKYL OXALATES: Form shock-sensitive mixtures.
AMMONIUM NITRATE: Forms explosive compound.
CARBON DIOXIDE: Incompatible.
CARBON DISULFIDE: Forms shock-sensitive mixtures.
CARBON TETRACHLORIDE: Incompatible.
DIAZOMETHANE: Explodes on contact.
DIMETHYLFORMAMIDE: Vigorous reaction when heated.
ETHANOL: Exothermic reaction.
FLUORINATED COMPOUNDS: Explode at elevated temperatures.
HALIDE OXIDES: Form shock-sensitive mixtures.
HALOCARBONS: Form shock-sensitive mixtures.
HALOGENS: May ignite or form shock-sensitive mixtures.
HYDRAZINE: Forms explosive compound.
HYDROXYLAMINE: Forms spontaneously flammable compound.
INTERHALOGENS: May ignite or form shock-sensitive mixture.
IODATES: Forms shock-sensitive mixture.
MALEIC ANHYDRIDE: Explosive decomposition reaction.
MERCURY: Violent exothermic reaction.
MERCURY OXIDE: May explode.
METAL HALIDES: Form shock-sensitive mixtures.
METAL OXIDES: Incandescent reaction and possible ignition.
MONOAMMONIUM PHOSPHATE: Possible explosive reaction.
NAPHTHALENE + AMMONIA: May explode on drying.
NITRIC ACID: Possible ignition.
NITROGEN CONTAINING EXPLOSIVES: May increase shock-sensitivity.
NITROSYL FLUORIDE: Incandescent reaction.
NITRYL FLUORIDE: Incandescent reaction.
NON-METALS: Vigorous or possibly violent reaction.
NON-METAL HALIDES: May ignite or explode.
NON-METAL OXIDES: May ignite or form explosive mixtures.
SODIUM NITRATE: Forms explosive compound.
SODIUM PEROXIDE: Explosive reaction.
SULFIDE OXIDES: Form shock-sensitive mixture.
2,2,3,3-TETRAFLUOROPROPANOL: May cause violent ignition.

Hazardous Decomposition Products
oxides of sodium

Thermal decomposition products: sodium monoxide.

Possibility of Hazardous Reactions
Polymerizes with evolution of heat. Avoid contact with light.

* * * Section 11 - TOXICOLOGICAL INFORMATION* * *

Component Analysis - LD50/LC50
The components of this material have been reviewed in various sources and no selected endpoints have been identified.

RTECS Acute Toxicity (selected)
The components of this material have been reviewed and RTECS publishes no data as of the date on this document.

Component Carcinogenicity
None of this product's components are listed by ACGIH, IARC, NTP, DFG or OSHA.

RTECS Irritation
The components of this material have been reviewed and RTECS publishes no data as of the date on this document.

Local Effects
SODIUM METAL (7440-23-5)
Corrosive: inhalation, skin, eye, ingestion

Inhalation - Acute Exposure
ALKALINE CORROSIVES: May cause irritation of the respiratory tract with coughing, choking, pain, and possibly burns of the mucous membranes. In some cases, pulmonary edema may develop, either immediately in severe cases or more often with a latent period of 5-72 hours. The symptoms may include tightness in the chest, dyspnea, frothy sputum, cyanosis, and dizziness. Physical findings may include hypotension, weak and rapid pulse and moist rales. Severe cases may be fatal.

Inhalation - Chronic Exposure
ALKALINE CORROSIVES: Depending on the concentration and duration of exposure, repeated or prolonged exposure may cause inflammatory and ulcerative changes in the mouth. There may also be bronchial and gastrointestinal disturbances leading to effects similar to those in acute exposure.

Inhalation - Other Toxicity Information
SODIUM METAL: May react with moisture to form sodium hydroxide, an alkaline corrosive. See information on alkaline corrosives.

Skin Contact - Acute Exposure
ALKALINE CORROSIVES: Direct contact may cause severe pain, burns and possibly brownish stains. The corroded areas may be soft, gelatinous, and necrotic. Tissue destruction may be deep.

Skin Contact - Chronic Exposure
ALKALINE CORROSIVES: Effects depend on the concentration and duration of exposure. Repeated or prolonged contact may cause dermatitis or effects similar to acute exposure.

Skin Contact - Other Toxicity Information
SODIUM METAL: May react with moisture to form sodium hydroxide, an alkaline corrosive. See information on alkaline corrosives.

Eye Contact - Acute Exposure
ALKALINE CORROSIVES: Direct contact may cause pain and burns. There may be edema, destruction of epithelium, corneal opacification and iritis. When damage is less than excessive, these symptoms tend to ameliorate. In severe burns, the full extent of the injury may not be immediately apparent. Late complications may include persistent edema, vascularization and scarring of the cornea, permanent opacity, staphyloma, cataract, symblepharon and blindness.

Eye Contact - Chronic Exposure
ALKALINE CORROSIVES: Effects depend on concentration and duration of exposure. Repeated or prolonged contact may result in conjunctivitis or effects as in acute exposure.

Eye - Other Toxicity Information
SODIUM METAL: May react with moisture to form sodium hydroxide, an alkaline corrosive. See information on alkaline corrosives.

Ingestion - Acute Exposure
ALKALINE CORROSIVES: May cause immediate pain, circumoral burns and corrosion of the mucous membranes which at first turn white and soapy and then become brown, edematous and ulcerated. There may be profuse salivation and difficulty or inability to swallow or speak. Even when there is no evidence of oral burns, the esophagus and stomach may be involved with burning pain, vomiting and diarrhea. The vomitus may be thick and slimy with mucous, and later contain blood and shreds of mucosa. Epiglottal edema may result in respiratory distress and possibly asphyxia. Shock with marked hypotension, weak and rapid pulse, shallow respiration, and clammy skin may occur. Circulatory collapse may ensue, and if uncorrected, lead to renal failure. In severe cases, esophageal or gastric perforation are possible and may be accompanied by mediastinitis, substernal pain, peritonitis, abdominal rigidity, and fever. Esophageal, and possibly gastric or pyloric stricture, may occur within a few weeks, but may be delayed for months or even years. Death may result within a short time from asphyxia, circulatory collapse, or aspiration of even minute amounts. If death is delayed it may be due to the complications of perforation, pneumonia, or the effects of stricture formation.

Ingestion - Chronic Exposure
ALKALINE CORROSIVES: Depending on the concentration, repeated ingestion may result in inflammatory and ulcerative effects on the oral mucous membranes and other effects as with acute ingestion.

Ingestion - Other Toxicity Information
SODIUM METAL: May react with moisture to form sodium hydroxide, an alkaline corrosive. See information on alkaline corrosives.

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* * * Section 12 - ECOLOGICAL INFORMATION* * *

Component Analysis - Aquatic Toxicity
No LOLI ecotoxicity data are available for this product's components.

---

* * * Section 13 - DISPOSAL CONSIDERATIONS* * *

Disposal Methods
Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D003.

Component Waste Numbers
The U.S. EPA has not published waste numbers for this product's components.

---

* * * Section 14 - TRANSPORT INFORMATION* * *

US DOT Information
Shipping Name: Sodium
Hazard Class: 4.3
UN/NA #: UN1428
Packing Group: I

Required Label(s): 4.3

TDG Information
Shipping Name: Sodium
Hazard Class: 4.3
UN #: UN1428
Packing Group: I
Required Label(s): 4.3

ADR Information
Shipping Name: Sodium
Hazard Class: 4.3
UN #: UN1428
Packing Group: I
Required Label(s): 4.3

ADR Tunnel Code Restrictions
This list contains tunnel restriction codes for those substances and/or chemically related entries which are found in chapter 3.2 of the ADR regulations.

SODIUM METAL (7440-23-5)
Restriction (s): B/E [UN1428] (I)

RID Information
Shipping Name: Sodium
Hazard Class: 4.3
UN #: UN1428
Packing Group: I
Required Label(s): 4.3

IATA Information
Shipping Name: Sodium
Hazard Class: 4.3
UN #: UN1428
Packing Group: I
Required Label(s): 4.3

ICAO Information
Shipping Name: Sodium
Hazard Class: 4.3
UN #: UN1428
Packing Group: I
Required Label(s): 4.3

IMDG Information
Shipping Name: Sodium
Hazard Class: 4.3
UN #: UN1428
Packing Group: I

* * * Section 15 - REGULATORY INFORMATION* * *

U.S. Federal Regulations

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 311/312 (40 CFR 370.21), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), and/or require an OSHA process safety plan.

SODIUM METAL (7440-23-5)
CERCLA: 10 lb final RQ; 4.54 kg final RQ

SARA Section 311/312 (40 CFR 370 Subparts B and C)
Acute Health: Yes **Chronic Health:** No **Fire:** Yes **Pressure:** No **Reactive:** Yes

U.S. State Regulations
The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA
SODIUM METAL	7440-23-5	Yes	Yes	No	Yes	Yes

Not listed under California Proposition 65

Germany Water Classification
SODIUM METAL (7440-23-5)
ID Number 772, hazard class 1 - low hazard to waters

Symbol(s)
F Highly Flammable
C Corrosive

Risk Phrases
R14 Reacts violently with water.
R15 Contact with water liberates extremely flammable gases.
R34 Causes burns.

Safety Phrases
S1/2 Keep locked-up and out of the reach of children.
S5 Keep contents under protective liquid.
S8 Keep container dry.
S43 In case of fire, use dry chemical, sand, earth, water or regular foam.
S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

Component Analysis - Inventory

Component	CAS	US	CA	EU	AU	PH	JP	KR	CN	NZ
SODIUM METAL	7440-23-5	Yes	DSL	EIN	Yes	Yes	Yes	Yes	Yes	Yes

Globally Harmonized System of Classification and Labelling (GHS)
The listed component(s) of this material have been checked for country-specific published classifications according to the Globally Harmonized System of Classification and Labelling (GHS). The results of the queries are displayed below. Please see the individual country listings, as additional interpretations or reference information may be available. For a reference list of H- or P-statements, please visit ChemADVISOR's website at www.chemadvisor.com\sdsoncommand\ghs_H&Pphrases.html.

Australia GHS Classifications
No published information available. This material may be hazardous according to published criteria for classification.

European Union GHS Classifications
Classifications below according to Regulation (EC) No 1272/2008 on classification, labelling and packaging of

substances and mixtures (CLP).

SODIUM METAL (7440-23-5)

Substances and mixtures which in contact with water emit flammable gases - Category 1 **H260** In contact with water releases flammable gases which may ignite spontaneously.

Skin corrosion/irritation - Category 1B **H314** Causes severe skin burns and eye damage.

European Union GHS Labelling Information
Labelling information below is according to Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures (CLP).

SODIUM METAL (7440-23-5)

Symbol(s):

Signal Word: Danger

Hazard(s):

H260: In contact with water releases flammable gases which may ignite spontaneously

H314: Causes severe skin burns and eye damage

Prevention:

P223: Keep away from any possible contact with water, because of violent reaction and possible flash fire.

P231+P232: Handle under inert gas. Protect from moisture.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

P260: Do not breathe dust/fume/gas/mist/vapours/spray.

P264: Wash ... thoroughly after handling.

Response:

P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P310: Immediately call a POISON CENTER or doctor/physician.

P303+P361+P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

P363: Wash contaminated clothing before reuse.

P335+P334: Brush off loose particles from skin. Immerse in cool water/wrap in wet bandages.

P301+P330+P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P321: Specific treatment (see ... on this label).

P370+P378: In case of fire: Use ... for extinction.

Storage:

P402+P404: Store in a dry place. Store in a closed container.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ...

Supplemental:

EUH014: Reacts violently with water.

Indonesia GHS Classifications
No published information available. This material may be hazardous according to published criteria for classification.

Japan GHS Classifications
Classifications below published under Japan's Chemicals Classification Program according to the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

SODIUM METAL (7440-23-5)

Substances and mixtures which in contact with water emit flammable gases - Category 1 **H260** In contact with water releases flammable gases which may ignite spontaneously.

Skin corrosion/irritation - Category 1 **H314** Causes severe skin burns and eye damage.

Serious eye damage/eye Irritation - Category 1 **H318** Causes serious eye damage.

Japan GHS Labelling Information
Labelling information below according to classifications published by Japan's Chemicals Classification Program according to the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

SODIUM METAL (7440-23-5)

Symbol(s):

Signal Word: Danger

Hazard(s):

H260: In contact with water releases flammable gases which may ignite spontaneously

H314: Causes severe skin burns and eye damage

H318: Causes serious eye damage

Prevention:

P223: Keep away from any possible contact with water, because of violent reaction and possible flash fire.

P231+P232: Handle under inert gas. Protect from moisture.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

P260: Do not breathe dust/fume/gas/mist/vapours/spray.

P264: Wash ... thoroughly after handling.

Response:

P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P310: Immediately call a POISON CENTER or doctor/physician.

P303+P361+P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

P363: Wash contaminated clothing before reuse.

P335+P334: Brush off loose particles from skin. Immerse in cool water/wrap in wet bandages.

P301+P330+P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P310: Immediately call a POISON CENTER or doctor/physician.

P321: Specific treatment (see ... on this label).

P370+P378: In case of fire: Use ... for extinction.

Storage:

P402+P404: Store in a dry place. Store in a closed container.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ...

Korea GHS Classifications (SV)
Classifications below published by Korea's Ministry of Environment (MOE), Ministry of Employment and Labor (MOEL) or Office of National Emergency Management (NEMA, physical hazards only).

SODIUM METAL (7440-23-5)

MOE:	Substances and mixtures which in contact with water emit flammable gases - Category 1 **H260** In contact with water releases flammable gases which may ignite spontaneously.
	Skin corrosion/irritation - Category 1 **H314** Causes severe skin burns and eye damage.
NEMA:	Substances and mixtures which in contact with water emit flammable gases - Category 1 **H260** In contact with water releases flammable gases which may ignite spontaneously.

Korea GHS Labelling Information
Labelling information below according to classifications published by Korea's Ministry of Environment (MOE), Ministry of Employment and Labor (MOEL) or Office of National Emergency Management (NEMA, physical hazards only).

SODIUM METAL (7440-23-5)

Symbol(s):

Signal Word: Danger

Hazard(s):

H260: In contact with water releases flammable gases which may ignite spontaneously

H314: Causes severe skin burns and eye damage

Prevention:

P223: Keep away from any possible contact with water, because of violent reaction and possible flash fire.

P231+P232: Handle under inert gas. Protect from moisture.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

P260: Do not breathe dust/fume/gas/mist/vapours/spray.

P264: Wash ... thoroughly after handling.

Response:

P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P310: Immediately call a POISON CENTER or doctor/physician.

P303+P361+P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

P363: Wash contaminated clothing before reuse.

P335+P334: Brush off loose particles from skin. Immerse in cool water/wrap in wet bandages.

P301+P330+P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P321: Specific treatment (see ... on this label).

P370+P378: In case of fire: Use ... for extinction.

Storage:

P402+P404: Store in a dry place. Store in a closed container.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ...

Symbol(s):

Signal Word: Danger

Hazard(s):

H260: In contact with water releases flammable gases which may ignite spontaneously

Prevention:

P223: Keep away from any possible contact with water, because of violent reaction and possible flash fire.

P231+P232: Handle under inert gas. Protect from moisture.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

Response:

P335+P334: Brush off loose particles from skin. Immerse in cool water/wrap in wet bandages.

P370+P378: In case of fire: Use ... for extinction.

Storage:

P402+P404: Store in a dry place. Store in a closed container.

Disposal:

P501: Dispose of contents/container to ...

New Zealand GHS Classifications
Classifications below according to the Environmental Risk Management Authority's (ERMA) Hazardous Substances and New Organisms (HSNO) Act, as amended. For a reference list defining the alphanumeric categories, please visit ChemADVISOR's website at www.chemadvisor.com\sdsoncommand\ghs_NZ.html

SODIUM METAL (7440-23-5) Approval: HSR001293

Substances and mixtures which in contact with water emit flammable gases - Category 1 **H260** In contact with water releases flammable gases which may ignite spontaneously.

Skin corrosion/irritation - Category 1B **H314** Causes severe skin burns and eye damage.

Serious eye damage/eye Irritation - Category 1 **H318** Causes serious eye damage.

Hazardous to aquatic environment - acute hazard - Category 3 **H402** Harmful to aquatic life.

New Zealand GHS Labelling Information
Labelling information below according to classifications published by New Zealand's Environmental Risk Management Authority's (ERMA) Hazardous Substances and New Organisms (HSNO) Act, as amended. For a reference list defining the alphanumeric categories, please visit ChemADVISOR's website at www.chemadvisor.com\sdsoncommand\ghs_NZ.html

SODIUM METAL (7440-23-5)

Symbol(s):

Signal Word: Danger

Hazard(s):

H260: In contact with water releases flammable gases which may ignite spontaneously

H314: Causes severe skin burns and eye damage

H318: Causes serious eye damage

H402: Harmful to aquatic life

Prevention:

P223: Keep away from any possible contact with water, because of violent reaction and possible flash fire.

P231+P232: Handle under inert gas. Protect from moisture.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

P260: Do not breathe dust/fume/gas/mist/vapours/spray.

P264: Wash ... thoroughly after handling.

P273: Avoid release to the environment.

Response:

P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P310: Immediately call a POISON CENTER or doctor/physician.

P303+P361+P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

P363: Wash contaminated clothing before reuse.

P335+P334: Brush off loose particles from skin. Immerse in cool water/wrap in wet bandages.

P301+P330+P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P310: Immediately call a POISON CENTER or doctor/physician.

P321: Specific treatment (see ... on this label).

P370+P378: In case of fire: Use ... for extinction.

Storage:

P402+P404: Store in a dry place. Store in a closed container.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ...

South Africa GHS Classifications

Information below presented according to the South African Bureau of Standards (SANS 10234:2008 - Globally Harmonized System (GHS) of Classification and Labelling of Chemicals). The information below identifies substances with recommended GHS classifications by CAS or RR numbers and chemical names; the data field contains the word "Present" along with any clarifying information in parenthesis. NOTE: Due to copyright laws on

the standard, we are not able to publish the classification. Details about South Africa's implementation of GHS are available by ordering the Standard and its supplement through the South African Bureau of Standards website.

SODIUM METAL (7440-23-5)

Listing: Present

Taiwan GHS Classifications

Information below presented according to Taiwan's Bureau of Standards, Metrology and Inspection (BSMI) of the Ministry of Economic Affairs. This agency has published a series of standards (CNS 15030 1-27 Chemical Classification and Labelling) which provide guidance on classification and labelling of chemicals according to GHS.

SODIUM METAL (7440-23-5)

Taiwan: Substances and mixtures which in contact with water emit flammable gases - Category 1 **H260** In contact with water releases flammable gases which may ignite spontaneously.

Skin corrosion/irritation - Category 1 **H314** Causes severe skin burns and eye damage.

Serious eye damage/eye Irritation - Category 1 **H318** Causes serious eye damage.

Taiwan GHS Labelling Information

Labelling information below according to classifications published by Taiwan's Bureau of Standards, Metrology and Inspection (BSMI) of the Ministry of Economic Affairs. This agency has published a series of standards (CNS 15030 1-27 Chemical Classification and Labelling) which provide guidance on classification and labelling of chemicals according to GHS.

SODIUM METAL (7440-23-5)

Symbol(s):

Signal Word: Danger

Hazard(s):

H260: In contact with water releases flammable gases which may ignite spontaneously

H314: Causes severe skin burns and eye damage

H318: Causes serious eye damage

Prevention:

P223: Keep away from any possible contact with water, because of violent reaction and possible flash fire.

P231+P232: Handle under inert gas. Protect from moisture.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

P260: Do not breathe dust/fume/gas/mist/vapours/spray.

P264: Wash ... thoroughly after handling.

Response:

P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a

position comfortable for breathing.

P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P310: Immediately call a POISON CENTER or doctor/physician.

P303+P361+P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

P363: Wash contaminated clothing before reuse.

P335+P334: Brush off loose particles from skin. Immerse in cool water/wrap in wet bandages.

P301+P330+P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P310: Immediately call a POISON CENTER or doctor/physician.

P321: Specific treatment (see ... on this label).

P370+P378: In case of fire: Use ... for extinction.

Storage:

P402+P404: Store in a dry place. Store in a closed container.

P405: Store locked up.

Disposal:

P501: Dispose of contents/container to ...

Classification
No classification assigned.

*** * * Section 16 - OTHER INFORMATION* * ***

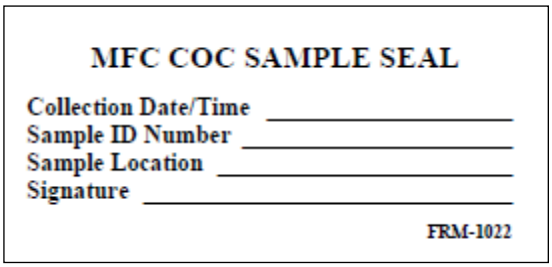
Key / Legend
ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSL - Domestic Substances List; EEC - European Economic Communicty; EINECS - European Inventory of Existing Commercial Chemical Substances; EPA - Environmental Protection Agency; EU - European Union; F - Farenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IMDG - International Maritime Dangerous Goods; JP - Japan; Kow - Octanol/water partition coefficient; KR - Korea; LEL - Lower Explosive Limit; LOLI - List Of LIsts™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PH - Philippines; RCRA - Resource Conservation and Recovery Act; RID - European Rail Transport; RTECS - Registry of Toxic Effects of Chemical Substances®; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UEL - Upper Explosive Limit; US - United States

Full text of R phrases in Section 3
R14/15 Reacts violently with water, liberating extremely flammable gases.
R34 Causes burns.

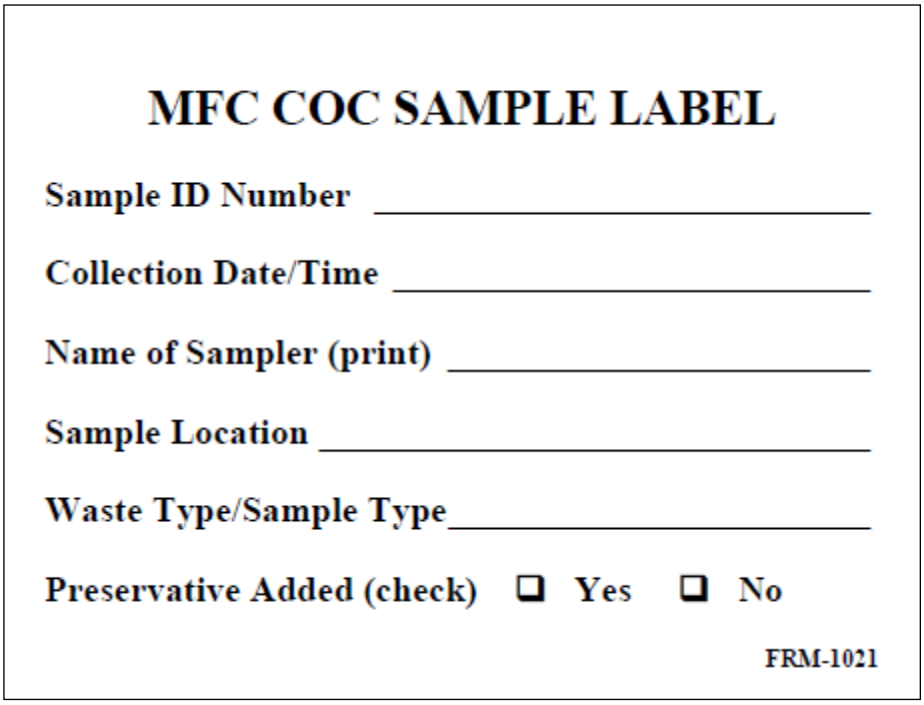
Other Information
Reasonable care has been taken in the preparation of this information; however, the manufacturer makes no warranty whatsoever including the warranty of merchantability, expressed or implied, with respect to this information. The manufacturer makes no representations and assumes no liability for any direct, incidental, consequential, or other such damages resulting from its use or misuse. **Disclaimer:** Supplier gives no warranty whatsoever, including the warranties of merchantability or of fitness for a particular purpose. Any product purchased is sold on the assumption the purchaser shall determine the quality and suitability of the product. Supplier expressly disclaims any and all liability for incidental, consequential or any other damages arising out of the use or misuse of this product. No information provided shall be deemed to be a recommendation to use any product in conflict with any existing patent rights. THIS MSDS IS TO BE UTILIZED SOLEY AS A REFERENCE DOCUMENT AND IT IS NOT TO BE USED TO SATISFY THE DISTRIBUTION REQUIREMENTS OF OSHA'S HAZARD COMMUNICATION STANDARD (HCS) NOR CANADA'S CONTROLLED PRODUCT REGULATION (CPR). Read the Material Safety Data Sheet before handling product. Use of any information contained herein is provided at the reader's own risk and thus independent judgment by trained professionals must be utilized at all times.

Attachment C-3

Examples of a Sample Label and a Custody Seal



Example Custody Seal.



Example Sample Label.

Attachment C-4

Example of a Chain of Custody Record

FRM-1020
11/12/09
Rev. 0

MATERIAL AND FUELS COMPLEX CHAIN OF CUSTODY RECORD

Date:	Sampled By: (Print Name)	Signature:	Waste Generating Process:

Analytical Sample Record Included ☐ No ☐ Yes Form #	Field Comments/Observations:

Date Collected	Time Collected	Sample ID Number	Number of Containers	Sample Location	Sample Matrix	Type and Amount of Preservative Added	Date and Time Preservative Added	Remarks

Relinquished By: (Print Name)	Signature	Organization	Date	Time			
Received By: (Print Name)	Signature	Organization	Date	Time	Y	N	
							Received with seal intact
							Label(s), Seals, COC(s) agree
Relinquished By: (Print Name)	Signature	Organization	Date	Time			
Received By: (Print Name)	Signature	Organization	Date	Time	Y	N	
							Received with seal intact
							Label(s), Seals, COC(s) agree
Relinquished By: (Print Name)	Signature	Organization	Date	Time			
Received By: (Print Name)	Signature	Organization	Date	Time	Y	N	
							Received with seal intact
							Label(s), Seals, COC(s) agree

Attachment C-5

Example of a LDR Notification Form

435.59
06/06/2013
Rev. 06

Idaho National Laboratory

Land Disposal Notification and Certification Form Phase IV

Bar Code(s): _____

Generator: INL for U.S. DOE Facility: _____

TSDF Profile No.: _____ Manifest No.: _____

Treatability Group: ☐ Wastewater ☐ Non-wastewater

U.S. EPA Only (Subcategories)

☐ D001 (High TOC)	☐ D005	☐ D010	☐ D020	☐ D030	☐ D040
☐ D001 (Except high TOC)	☐ D006	☐ D011	☐ D021	☐ D031	☐ D041
☐ D002	☐ D006 (Batteries)	☐ D012	☐ D022	☐ D032	☐ D042
☐ D003 (Reactive cyanide)	☐ D007	☐ D013	☐ D023	☐ D033	☐ D043
☐ D003 (Reactive sulfide)	☐ D008	☐ D014	☐ D024	☐ D034	
☐ D003 (Explosives)	☐ D008 (Lead acid batteries)	☐ D015	☐ D025	☐ D035	☐ F001
☐ D003 (Water reactives)	☐ D008 (Radioactive lead solids)	☐ D016	☐ D026	☐ D036	☐ F002
☐ D003 (Unexploded ordinance)	☐ D009 (Org. Hg ≥ 260 mg/kg)	☐ D017	☐ D027	☐ D037	☐ F003
☐ D003 (Other reactives)	☐ D009 (Inorg. Hg ≥ 260 mg/kg)	☐ D018	☐ D028	☐ D038	☐ F004
☐ D004	☐ D009 (Hg < 260 mg/kg)	☐ D019	☐ D029	☐ D039	☐ F005

☐ Other (list code and subcategory as applicable):

Solvent Constituents (F001 through F005) ☐ Check here if TSDF will check for all spent solvents.

☐ Acetone (F003)	☐ Ethyl benzene (F003)	☐ Ortho-dichlorobenzene (F002)
☐ Benzene (F005)	☐ Ethyl ether (F003)	☐ Pyridine (F005)
☐ Carbon disulfide (F005)	☐ Isobutanol (F005)	☐ Tetrachloroethylene (F001/F002)
☐ Carbon tetrachloride (F001)	☐ Methanol (F003)	☐ Toluene (F005)
☐ Chlorinated fluorocarbons (F001)	☐ Methyl ethyl ketone (F005)	☐ 1,1,2-Trichloro-1,2,2-trifluoroethane (F002)
☐ Chlorobenzene (F002)	☐ Methyl isobutyl ketone (F003)	☐ 1,1,1-Trichloroethane (F001/F002)
☐ Cresols (F004)	☐ Methylene chloride (F001, F002)	☐ 1,1,2-Trichloroethane (F002)
☐ Cresylic acid (F004)	☐ n-Butyl alcohol (F003)	☐ Trichloroethylene (F001/F002)
☐ Cyclohexanone (F003)	☐ Nitrobenzene (F004)	☐ Trichlorofluoromethane (F002)
☐ 2-Ethoxyethanol (F005)	☐ 2-Nitropropane (F005)	☐ Xylene (F003)
☐ Ethyl acetate (F003)		

Underlying Hazardous Constituents

☐ No UHCs present ☐ Treat for UHCs (see attached Form 435.63) ☐ Check for UHCs

Certification Statements

NOTE 1: *States authorized by EPA to manage the LDR program may have regulatory citations different from the 40 CFR citations listed below. Where these regulatory citations differ, your certification will be deemed to refer to those state citations instead of the 40 CFR citations.*

NOTE 2: *The generator has considered 40 CFR Part 268, Subpart C and D in development of this LDR.*

☐ RESTRICTED WASTE REQUIRES TREATMENT PER LAND DISPOSAL RESTRICTIONS

This waste must be treated to the applicable treatment standards set forth in 40 CFR 268.40.

☐ For hazardous debris: "This hazardous debris is subject to the alternative treatments standards of 40 CFR 268.45."

☐ For contaminated soil: "This contaminated soil is subject to the alternative treatment standards of 40 CFR 268.49"

AND it contains a concentration of < 1,000 mg/kg halogenated organic compounds.

"This contaminated soil [does/does not] contain listed hazardous waste and [does/does not] exhibit a characteristic of hazardous waste and [is subject to/complies with] soil treatment standards as provided by 40 CFR 268.49(c) or the universal treatment standards."

☐ DECHARACTERIZED WASTE REQUIRES TREATMENT FOR UHCs [40 CFR 268.7(b)(4)(iv)]

"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 that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment."

☐ RESTRICTED WASTE CAN BE LAND DISPOSED WITHOUT FURTHER TREATMENT [40 CFR 268.7(a)(3)]

"I certify under penalty of law that I have personally 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 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."

☐ Other (See Attached)

I hereby certify that all information in this and associated documents is true, complete, and accurate to the best of my knowledge.

_____ _____

Print/Sign (qualified WTS) Date

435.59
06/06/2013
Rev. 06

Idaho National Laboratory

Land Disposal Notification and Certification Form Phase IV

Additional Certification Statements

Bar Code(s): _____

☐ RESTRICTED WASTE TREATMENT TO PERFORMANCE STANDARDS [40 CFR 268.7(b)(4)]
"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 to comply with the treatment standards specified in 40 CFR 268.40 without impermissible dilution of the prohibited waste. I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment."

☐ GOOD FAITH AND ANALYTICAL CERTIFICATION - FOR INCINERATED ORGANICS [40 CFR 268.7(b)(4)(iii)]
"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 non-wastewater organic constituents have been treated by combustion units as specified in 40 CFR 268.42, Table 1. I have been unable to detect the non-wastewater organic constituents, despite having used best good faith efforts to analyze for such constituents. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment."

☐ RESTRICTED WASTE SUBJECT TO A VARIANCE
This waste is subject to a national capacity variance, a treatability variance, or a case-by-case extension. Enter the effective date of prohibition:

☐ For hazardous debris: "This hazardous debris is subject to the alternative treatments standards of 40 CFR 268.45."

☐ WASTE NOT CURRENTLY SUBJECT TO PART 268 RESTRICTIONS
This waste is newly identified waste that is not currently subject to any 40 CFR Part 268 restrictions.

Attachment C-6

Example of Waste Streams Managed at each MFC HWMU

Hot Fuels Examination Facility (HFEF, MFC-785)							
Originating Facility	**Containers**	**STP Waste Stream ID**	**Material Profile**	**Material or Waste Type**	**Waste Type**	**Treatment**	**Destination**
MFC	Drum	CH-ANL-505Ta	3657P	Glovebox Debris from: Testing , Alpha, & Special Projects, Casting Labs , etc.	MTRU-CH	WIPP Disposal	offsite disposal
MFC	Drums	CH-ANL-553	5399N	Transuranic samples from the AL, HEPA Filters	MTRU-CH	WIPP Disposal	offsite disposal
MFC	Boxes	CH-ANL-716CH	4807N.R2	Site-Wide RCRA Characteristic Metal Debris	MLLW	Commercial treatment	offsite disposal

Radioactive Scrap Waste Facility (RSWF, MFC-771)							
Originating Facility	**Containers**	**STP Waste Stream ID**	**Material Profile**	**Material or Waste Type**	**Waste Type**	**Treatment**	**Destination**
MFC	paint cans, HFEF 5 Cans, SLSF Cans, nonstandard containers	CH-ANL-180RH	ANL180RH	Debris and Equipment Contaminated with Sodium-Remote Handled	MLLW	RWDP	offsite disposal
MFC	paint cans, HFEF 5 Cans, SLSF Cans, nonstandard containers	CH-ANL-180RH	6516Q	RH-MLLW due to Sodium Content	MLLW	RWDP	offsite disposal
MFC	HFEF-5 Cans	CH-ANL-182RH	6517Q	RH-MLLW due to Sodium - Potassium Alloy (NaK) Content	MLLW	RWDP	offsite disposal
MFC	HFEF-5 Cans, SLSF Cans	CH-ANL-241Ta	ANL241T	RH-MTRU (Solidified fuel samples, debris contaminated with RCRA Metals (Cd, Cr, Ba and/or Pb) and HEPAs	MTRU-RH	RWDP	offsite disposal
MFC	Paint cans, HFEF-5 Cans, SLSF Cans	CH-ANL-716RH	6518Q	RH-MLLW due to RCRA Metals	MLLW	RWDP	offsite disposal
MFC	HFEF-5 Cans	CH-ANL-716RH	5212N	RH-MLLW (FCF Hot-Cells generated Misc. Rags, Tools, Filters, Sweepings, Plastics, etc.)	MLLW	RWDP	offsite disposal
Non-standard container - cold trap, EBR-II nuclide traps							

Sodium Components Maintenance Shop (SCMS, MFC-793)							
Originating Facility	**Containers**	**STP Waste Stream ID**	**Material Profile**	**Material or Waste Type**	**Waste Type**	**Treatment**	**Destination**
MFC	Drums, Non-Standard containers	CH-ANL-180CH	ANL180CH	Debris and Equipment Contaminated with Sodium - Contact Handled	MLLW	Deact	offsite disposal
MFC	Drum	CH-ANL-180CH	6825N	Sodium metal or sodium filled equipment (radioactive)	MLLW	Deact	offsite disposal
MFC	Non-Standard container	CH-ANL-182CH	ANL182CH	Debris or Equipment Contaminated with Sodium-Potassium (NaK) Alloy	MLLW	Deact	offsite disposal
MFC	Boxes	CH-ANL-716CH	4807N.R2	Site-Wide RCRA Characteristic Metal Debris	MLLW	Commercial Treatment	offsite disposal
MFC	Drum	CH-ANL-722	5447N.R1	Radioactive Contaminated Alkali Metal	MLLW	Deact	offsite disposal
MFC	Drum	NA	6435N.R1	Broken Lead Acid Batteries at MFC	HAZ	Commercial Treatment	offsite disposal
Nonstandard container - Process components							

Sodium Storage Building (SSB, MFC-703)							
Originating Facility	**Containers**	**STP Waste Stream ID**	**Material Profile**	**Material or Waste Type**	**Waste Type**	**Treatment**	**Destination**
MFC	Drums, Boxes	CH-ANL-179	ANL179	Tin-Bismuth Alloy contaminated with Sodium	MLLW	Deact	offsite disposal
MFC	Drums, Non-Standard containers	CH-ANL-180CH	ANL180CH	Debris and Equipment Contaminated with Sodium - Contact Handled	MLLW	Deact	offsite disposal
MFC	Drums	CH-ANL-180CH	6825N	Sodium metal or sodium filled equipment (radioactive)	MLLW	Deact	offsite disposal
MFC	Non-Standard container	CH-ANL-180RH	ANL180RH	Debris and Equipment Contaminated with Sodium-Remote Handled	MLLW	RWDP	offsite disposal
MFC	Drums, Non-Standard container	CH-ANL-182CH	ANL182CH	Debris or Equipment Contaminated with Sodium-Potassium (NaK) Alloy	MLLW	Deact	offsite disposal
MFC	Drums	CH-ANL-241Ta	ANL241T	RH-MTRU (Solidified fuel samples, debris contaminated with RCRA Metals (Cd, Cr, Ba and/or Pb) and HEPAs	MTRU-RH	RWDP	offsite disposal
MFC	Non-Standard container	CH-ANL-722	2225P	Lithium Hydride/Lithium Chloride/Potassium Chloride	MLLW	Deact	offsite disposal
MFC	Drum	CH-ANL-722	7262Q	Radioactive Contaminated Alkali Metal Newly Generated	MLLW	Deact	offsite disposal
Non-standard container - Process equipment							

RSWF Staging/Storage Area							
Originating Facility	**Containers**	**STP Waste Stream ID**	**Material Profile**	**Material or Waste Type**	**Waste Type**	**Treatment**	**Destination**

Note: No HW/MW is being stored at this time.

North Fenced Area (NFA)							
Originating Facility	**Containers**	**STP Waste Stream ID**	**Material Profile**	**Material or Waste Type**	**Waste Type**	**Treatment**	**Destination**

Note: No HW/MW is being stored at this time.